Causes of Post Stroke Falls Along the Care Continuum: Implications for Improving Patient Safety

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A thesis submitted in partial fulfillment of the requirements for the degree in Master of Science
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CAUSES OF POST STROKE FALLS ALONG THE CARE CONTINUUM: IMPLICATIONS FOR IMPROVING PATIENT SAFETY

(Thesis format: Monograph)

by

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science
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Abstract

In Western countries stroke is responsible for 10-12% of all deaths. In 2000, strokes cost $3.6 billion for the Canadian healthcare system and lost productivity due to premature death and long-term disability. Falls are a frequent occurrence at all stages of post-stroke recovery and can have significant negative impacts. Although information about the incidence and risk factors of falling among stroke survivors is available, considerably less is known about the specific factors contributing to falls and the circumstances surrounding these adverse events. The purpose of this project was to identify similarities between systemic factors of falls in stroke survivors across the continuum of care. Sixty-eight stroke survivors were enrolled and monitored for falls for six months post-stroke. A total of 22 falls across the care continuum were investigated using the Systemic Falls Investigative Method (SFIM). Comprehensive data were collected through multiple interviews, document reviews, environmental scans, and re-creation of events. These data were entered into the SFIM Database to produce falls reports. The guiding framework in data reduction and analysis was the Swiss Cheese Model of Accident Causation. Using within-case and across-case analyses, a total of 755 contributing factors were identified and grouped into patterns. Patterns were reported with prevalence rates of 100%, 80-99% and 60-79%. Patterns unique to a particular setting were also reported. When considering falls prevention programs in post-stroke rehabilitation and community re-integration, it is important to address not only stroke-specific health causes of falls (for example, poor balance, poor judgment), but also latent system-wide components (for example, inadequate supervision, insufficient community support) that affect stroke survivor’s safety.

Keywords

Stroke, falls, accident investigations, systems approach, Swiss Cheese Model, human error, safety deficiencies, stroke rehabilitation, patient safety.
Acknowledgments

I would like to acknowledge the guidance and support provided by Dr. Aleksandra Zecevic and Dr. Alan Salmoni. Your patience, encouragement and insights kept me going throughout this learning process, without you this project would not have been possible.

To Dr. Bryan Young and Eileen Britt, I extend my thank you for your support and stroke knowledge and your assistance in navigating the acute care and stroke rehabilitation settings.

To the girls of the SFIM research group, I could not have done this without you. A special thank you to Mahboubeh Mehrjoo for your endless hours triangulating and Michelle Dellamora for keeping me company on long, cold winter nights while we completed never-ending revisions.

Finally, to all participating organizations, thank you for letting us in and giving us a glimpse of the world of caring for a stroke survivor.

Funding for this project was provided by the Ontario Stroke Network.

Dedication

Most of all, I would like to thank my family: my sister, brother and especially my parents for their continual support. They push me to be better every day and it is to them that I dedicate this experience. Last but not least, my loyal companions, Maddy, Pippa and Pasha, for never leaving my side.
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Chapter 1

1 Introduction

Strokes are one of the leading causes of adult disability in developed countries (Batchelor, Mackintosh, Said, & Hill, 2012; Mackay, & Mensah, 2004). In Canada, there are approximately 50,000 new stroke cases each year, and in 2009 there were 315,000 stroke survivors, living with the long-term effects (Goeree, Blackhouse, Petrovic, & Salama, 2005). In 2000, strokes cost $3.6 billion for the Canadian healthcare system and lost productivity due to premature death and long-term disability. In 2005-2006, strokes were cited as the main reason for 38,341 hospitalizations (Public Health Agency of Canada (PHAC), 2011). Due to advances in medicine, and specifically in acute stroke management, incidences in stroke-related mortality have decreased. However, due to the aging of the population, the number of people surviving a stroke has increased. Consequently, individuals are more likely to be living with functional impairments and disabilities due to stroke (Clarke, Marshall, Black, & Colantonio, 2002).

Strokes can lead to physical, cognitive, and psychological impairments that require some form of rehabilitation (Batchelor, Hill, Mackintosh, & Said, 2010). In 2005-2006, 41.7% of individuals hospitalized for stroke were discharged home, 39.5% were transferred to another facility, and 18.3% died in hospital (PHAC, 2011).

In all stages of recovery after stroke, falls are a major potential adverse event (Batchelor et al., 2012), with advanced age further compounding the risk. The incidence of stroke survivors experiencing a fall at all levels of the continuum of care is higher than for other patient populations. Between 14%-65% of stroke survivors experience a fall while in hospital, and 73% experience a fall within the first six months post-discharge to home (Batchelor et al., 2010). Falls frequency in the stroke population is especially high after discharge from acute care and stroke rehabilitation. Falls in stroke patients may result in serious injury such as head trauma and fractures (Batchelor et al., 2010). They are also associated with an increased length of stay in hospital, increased health care costs, and an increased chance of discharge to a long-term care facility instead of to the community. In addition, fallers have an increased fear of falling, potentially leading to activity restriction and loss of independence (Forrest et al., 2012).
Although researchers agree that stroke survivors are at an especially high risk for falls (Czernuszenko, & Czlonkowska, 2009; Kerse et al., 2008; Teasell, McRae, Foley, & Bhardwaj, 2002;), previous studies have only focused on incidence and risk factors of falling among stroke survivors, with considerably less attention given to specific contributing factors of falls and the circumstances surrounding the adverse event. Understanding specific factors that lead to falls allows immediate, targeted intervention. Identification of the multitude of contributing factors that led to the event allows blame to be taken away from the person who fell and be redirected to investigating gaps in the system that may otherwise have been overlooked. Using a systems approach to look at not only intrinsic and extrinsic factors related to the faller, but also everyone and everything surrounding the incident that are considered potential safety barriers, allows for clear identification of the contributing factors of falls in stroke survivors. Identification of reasons why stroke survivors fall allows for targeted intervention and prevention strategies, allowing for an increase in safety within the healthcare system and in the community. This study employs a systemic investigative tool to accurately identify specific factors and reasons that led to falls in stroke survivors in three distinct settings along the stroke continuum of care, with the hope that the resulting comprehensive case study reports will guide future improvements in safety.

1.1 Stroke

Stroke, a life-threatening and debilitating event, is a form of cardiovascular disease affecting the blood supply to the brain (Goeree et al., 2005). The proper functioning of nerve cells within the brain requires a continuous supply of blood, oxygen, and glucose. When this supply is impaired, either by a blockage or a rupture of blood vessels, brain cells stop functioning or die, leading to permanent damage (Brass, 1992). The human brain represents only 2% of the body’s weight, yet uses about 25% of the body’s oxygen supply and 70% of the body’s glucose supply. Unlike muscles, the brain is unable to store nutrients and it therefore requires a constant supply. An interruption of this supply for as little as four minutes can lead to permanent brain damage, making stroke a highly dangerous event (Brass, 1992).
1.1.1 Stroke Subtypes

Strokes can be divided into two broad categories: ischemic and hemorrhagic. An ischemic stroke is the result of a blood clot interrupting the blood flow to the brain. These blood clots or narrowing of the arteries, also known as atherosclerosis, are caused by fatty substances, cholesterol, cellular waste products, calcium, blood clotting material, and scar tissue (Heart and Stroke Foundation of Canada-Statistics website, n.d.). Approximately 80% of strokes are classified as ischemic. Within the category of ischemic strokes, there are several subcategories. The first subtype of ischemic stroke is known as cerebral atherothrombosis (also known as large artery disease), which is caused by a clot or thrombus blocking blood flow in an artery. The term cerebral infarction is used if the blood clot results in death of brain tissue (Brass, 1992). A second type of ischemic stroke is known as a cerebral embolism or embolic stroke. An embolus refers to a blood clot that has formed in one part of the body (usually in the heart) and has broken loose and traveled to a blood vessel elsewhere in the body. When the blood clot reaches blood vessels within the brain, it causes an embolic stroke. Embolic strokes are the most common type of ischemic strokes (Brass, 1992). A third type of ischemic stroke is systemic hypoperfusion, or a general decrease in blood supply, mainly due to problems in cardiac pump or loss of blood (Caplan, 2009).

Hemorrhagic strokes account for approximately 20% of all strokes. Hemorrhagic strokes are caused by a rupture of a blood vessel, which leads to bleeding into either the brain itself (intracerebral hemorrhage) or the space surrounding the brain (subarachnoid hemorrhage)( Heart and Stroke Foundation of Canada-Statistics website, n.d.). A history of hypertension, diabetes, and atherosclerosis is thought to lead to weakened blood vessels in the brain. This in turn can cause small blood vessels at the base of the brain to leak and cause an intracerebral hemorrhage (Brass, 1992). A subarachnoid hemorrhage occurs when the bleeding takes place between the brain and the skull, usually caused by an aneurysm or a vascular malformation. The blood is quickly dispersed within the spinal fluid pathways surrounding the brain (Caplan, 2009). Both these types of hemorrhagic strokes are caused by problems with the integrity of the blood vessels, including aneurysms and arteriovenous malformations. Aneurysms are weakened portions of the blood vessels, which fill with blood and bulge, ready to rupture with increased blood pressure or trauma. Arteriovenous malformations are congenital defects in the blood vessels that cause a weakening of the artery walls, again increasing the risk of rupture (Heart and
Stroke Foundation of Canada-Statistics website, n.d.). Other forms of hemorrhagic strokes include subdural and epidural hemorrhages, caused by head trauma, whereby injured blood vessels lead to the slow accumulation of blood (hematoma) within different layers of the surrounding brain tissue (Caplan, 2009). Lastly, it is important to discuss a “mini stroke” or a transient ischemic attack (TIA), which often leads to a full stroke. A TIA is often passed off as nothing due to the fact that it is a temporary decrease in blood flow that resolves quickly. Most people do not seek medical attention for a TIA; however, a third of all people who experience a TIA will go on to suffer a stroke (Brass, 1992). Figure 1 shows the breakdown of the subtypes of stroke.

Figure 1 Stroke Subtypes
1.1.2 Consequences of Stroke

Depending on the type, severity, and location of the stroke, the effects of stroke can vary and can lead to a range of impairments and disabilities (Caplan, 2009). The brain is divided into three major regions: the cerebrum, the cerebellum, and the brain stem. Strokes occurring in the cerebrum can affect movement, sensation, speech and language, eating and swallowing, vision, cognitive processes, such as thinking, reasoning, memory and judgment, perception and orientation, sexual function, and the regulation of emotions. The cerebrum is composed of right and left hemispheres. Strokes occurring in the right hemisphere can cause left-sided weakness (hemiparesis), paralysis (hemiplegia), sensory impairment, a lack of insight into or denial of the impairments created by the stroke (also known as “left neglect”), visual problems such as the inability to see the left visual field of each eye (homonymous hemianopsia), problems with spatial and depth perception and directions, the inability to recognize body parts or find objects, memory problems, and finally behavioural problems such as a lack of concern, impulsivity, inappropriateness, and depression (Caplan, 2009; Wexner Medical Centre, n.d.). A left hemisphere stroke can lead to right-sided weakness (hemiparesis); paralysis (hemiplegia); problems with speech such as the articulation of words (dysarthria) and understanding language (aphasia); the inability to see the right visual field of each eye (homonymous hemianopsia); an impaired ability to organize, reason, or analyze items; to do math, read, write, or learn new information; memory problems; depression; cautiousness; and hesitancy (Caplan, 2009).

The cerebellum is responsible for the coordination of muscle action and control, as well as fine motor control and balance. Therefore, strokes occurring in this region of the brain are considered severe and can impact the ability to walk, control coordination, and balance (ataxia). Strokes in this region can also cause dizziness, headaches, nausea and vomiting. Strokes in the cerebellum are, however, less common than strokes in the cerebrum (Brass, 1992).

Finally, the most severe types of strokes occur in the brain stem. Strokes in this region of the brain often lead to death or coma, because the brain stem is responsible for basic life sustaining functions such as heartbeat, blood pressure, and breathing (Wexner Medical Centre, n.d.).
Recovery from a stroke begins with hospitalization, diagnostic testing, prevention strategies, and planning for the next level of care. In order to prevent prolonged hospitalization and introduce appropriate rehabilitation quickly, quantitative assessment tools are used by clinicians upon admission to assess the severity of stroke and to streamline access to rehabilitation. One of the tools used to assess severity of stroke is the National Institute of Health Stroke Scale (NIHSS), which includes the assessment of level of consciousness, visual fields, facial palsy, motor strength, sensation, language, ataxia, dysarthria, and inattention (Schlegel et al., 2003). Another common tool used to assess recovery of activities of daily living (ADLs) is the Functional Independence Measure (FIM). The Montreal Cognitive Assessment (MoCA) is also commonly used in stroke patients to assess mild cognitive impairment. It is a stronger and more sensitive measure than the Mini Mental State Exam (MMSE), another commonly used tool for the assessment of cognitive impairment (Godefroy et al., 2011). MoCA assesses attention, executive functions, memory, language, conceptual thinking, calculations, visuospatial skills, and orientation (Zeltzer & Marvin, StrokEngine, n.d.).

The path a stroke patient takes on the road to recovery varies from patient to patient and is often dependent on many factors, including age, severity of stroke and deficits caused by the stroke, cognitive impairment, family support, and social situation. The continuum of care in stroke recovery and the varying pathways is illustrated in figure 2. Regardless of where a patient is within the continuum of post stroke care, the number one medical complication that affects patients in all stages of stroke care is falls (Weerdesteyn, de Niet, van Duijnhoven, & Geurts, 2008).
1.2 Falls after stroke

1.2.1 Prevalence and Consequences

Individuals who have survived a stroke are at a high risk for falls in all stages of the continuum of care (Weerdesteyn et al., 2008). According to the World Health Organization (WHO), a fall occurs when a person inadvertently experiences a loss of balance and lands on a lower level (WHO, 2012). Among individuals aged 65 and over, approximately 28-35% fall each year, with an increase to 30-50% of individuals falling in a long-term care facility (WHO, 2012). However, among the stroke population, the falls’ incidence rates varies between 14-65% during hospitalization and 37-73% during the first six-months post discharge (Batchelor et al., 2012). The large variability in these rates is attributed to differences in hospital length of stay (Weerdesteyn et al., 2008). Recurrent falls are also more common among stroke survivors than the general population (Batchelor et al., 2012).
Approximately 20-57% of community-dwelling stroke survivors experience recurrent falls compared to 15% in the general elderly population (Batchelor et al., 2012; Doherty & Crossen-Sills, 2009).

One of the major consequences of falls is hip fractures. Stroke survivors are four times more likely to sustain a hip fracture than the general population (Andersson, Seiger & Appelros, 2013). Due to impaired motor abilities and hemiparesis, stroke survivors tend to fall on the affected side (Batchelor et al., 2012) and are less likely to break their fall by extending their arms. Bone resorption is also common after stroke, further increasing the chances of hip fractures (Andersson et al., 2013). Approximately 20-30% of stroke survivors are unable to get up independently after a fall, further increasing the chances for complications such as hypothermia or dehydration. Other physical consequences of a fall among stroke survivors include head trauma, increased admission to a long-term care facility, increased hospital length of stay, increased healthcare use, and death (Schmid et al., 2010).

In addition to the physical consequences of falls, stroke survivors and their families can also face significant psychosocial consequences, including fear of falling, social deprivation, depression, and caregiver burden (Weerdesteyn et al., 2008). Fear of falling can lead to physical activity restriction and consequently deconditioning. Among stroke survivors who have experienced a fall, 44% report limiting their activities due to a fear of falling (Weerdesteyn et al., 2008). As a result of a fear of falling, stroke survivors may also become socially isolated. In turn, this reduction in social activity and dependence on others can have a negative effect on caregivers (Weerdesteyn et al., 2008). Informal caregivers of stroke survivors (usually family members) play an integral part of the recovery process. The well-being and quality of life of these informal caregivers is directly linked to the care recipient’s recovery. Therefore, when a stroke survivor experiences fear of falling, this fear inadvertently affects the quality of life of the care provider (Batchelor et al., 2012). Furthermore, the restriction of activity and socialization and the negative impact on the quality of life of the care provider can also lead to depression in the stroke survivor. Depression is not only a risk factor for falls but also a consequence of recurrent falling (Weerdesteyn et al., 2008). Falls are a common consequence of stroke and can have a detrimental effect on the physical and psychosocial lives of the stroke survivors and their
informal care providers. The risk of falling for stroke survivors is multi-factorial and is usually the result of a combination of numerous contributing factors. At all stages of stroke recovery, it is important to identify the causes and contributing factors of falls in order to guide appropriate prevention strategies.

1.2.2 Circumstances and risk factors: Review of the literature

Understanding why, where, and when stroke survivors fall is important in preventing falls and the subsequent consequences of falls. The circumstances or contributing factors that surround a fall can be distinct in different settings, and while falls occur at all stages of the continuum of care in stroke recovery, studies suggest that the transition between settings is critical (Batchelor et al., 2012). Studies have shown that people with stroke are more likely to fall in the first few weeks of rehabilitation and the first two months after discharge home (Aizen, Shugaev, & Lenger, 2007; Rabadi, Rabadi, & Peterson, 2008). Although fall risk has been studied closely in the post-stroke rehabilitation phase, fewer studies have looked at post-stroke falls in the acute hospital setting before discharge to stroke rehabilitation or home. Schmid et al. (2010) found that 5% of patients who had suffered an ischemic stroke fell in the acute care setting. They also reported that stroke severity, a history of anxiety, and a loss of functional status were associated with falls. According to their findings, Schmid et al. (2010) suggest that resources should be allocated to anyone with an NIHSS ≥ 8. Falls in the acute care stage have been reported to occur during the day in either the patient’s room or bathroom (Tutuarima, Van der Meulen, De Haan, Van Straten, & Limburg, 1997). Similar findings have been reported for stroke rehabilitation.

Incidences of falls in inpatient rehabilitation settings are higher than in acute care (Batchelor et al., 2012; Good, Bettermann, & Reichwein, 2011) and have been studied more extensively. The proportion of patients who fall in the stroke rehabilitation setting ranges from 8.7% to 39%, with 1.9-6.9% resulting in a fracture (Czernuszenko, & Czlonkowska, 2009). In a retrospective cohort study, Teasell et al. (2002) reported a rate of 37% of stroke patients experiencing at least one fall and 19% experiencing at least two falls. In this study it was found that patients fell most frequently from their beds and wheelchairs, and serious injuries were rare.
They found no difference in stroke type, location, or gender between fallers and non-fallers, but fallers were more likely to be apraxic (the inability to carry out learned purposeful movements) and have cognitive deficits (Teasell et al., 2002).

A large prospective observational study (a total of 1155 patients; of whom 252 fell) conducted in Poland found that falls occurred in 16% of patients during stroke inpatient rehabilitation but that only 1.2% of falls resulted in a fracture (Czernuszenko, & Członkowska, 2009). Czernuszenko and Członkowska (2009) found that two-thirds of falls happened in the first two weeks after admission and that the incidence rate for a first fall was highest during the first week of rehabilitation. Also, a patient who fell once was two times more likely to experience a second fall. Most falls in this study occurred during the day, between 6 am to 8 pm, with incidence rates peaking between 11 am to 1 pm. It was also found that most falls took place in the patient’s room or bathroom, and patients often fell during activities such as transfers (34%), while sitting (24%), and during position changes such as from sitting to standing or standing to sitting (13%). The authors reported that in 24 cases, inadequate or insufficient staff assistance resulted in a fall; in 3 cases patients slid on a wet floor; and in 3 cases falls occurred due to inadequate assistance by visitors (Czernuszenko, & Członkowska, 2009). Finally, it was reported that the risk of falls increased with the increasing efficiency of rehabilitation, that is, patients with better functional gain were more likely to fall. Falls also occurred in patients who were older, had a longer length of stay in the rehabilitation unit, had left-sided motor deficits, had neglect, and who were on anti-depressant medications. The authors did not find any association between falls and gender, visual and sensory deficits, aphasia, or left-sided or bilateral paresis, but they did report a relationship between poor performance in Activities of Daily Living (ADLs) and fall risk. Czernuszenko and Członkowska (2009) recommend that tools measuring ability to perform ADLs be used to screen for patients at high risk for falls. Suzuki et al. (2005) found that patients with lower motor sub-scores on the FIM on admission had a higher risk of falls and repeat falls.

In an integrative review, Campbell and Matthews (2010) looked at 14 studies reporting risk factors for falls in stroke rehabilitation. They concluded that, according to the evidence, stroke-specific deficits put an individual at greater risk for falls during stroke rehabilitation. Specifically, they believed that individuals with impaired balance, visuospatial hemineglect, and
impaired performance on ADLs were at highest risk for falls during stroke rehabilitation (Campbell & Matthews, 2010). Other studies looking at risk factors for falls in stroke rehabilitation have reported that patients engage in risky behaviours such as performing activities that they were advised not to perform without supervision, such as independently transferring (Aizen et al., 2007; Nyberg, & Gustafson, 1995). Batchelor et al. (2012) argued that this remains a challenge for stroke rehabilitation, because restricting activity in order to keep a patient safe can hinder motivation, mobility, independence, and recovery.

Finally, within the community, it has been reported that incidence of falls is highest in the first two months after discharge home from rehabilitation (Batchelor et al., 2012). In a longitudinal study, 231 stroke survivors were recruited before discharge from stroke rehabilitation and interviewed monthly by telephone for 1-32 months regarding falls incidence. The study found that 18% of participants fell in the first month while 56% reported a loss of balance (near fall) and less than 10% fell after month five. At least one third of participants reported a loss of balance (near fall) each month (Wagner, Phillips, Hunsaker, & Forducey, 2009). The authors acknowledged that, because their study only followed stroke survivors who were discharged home (rather than a long-term care facility), the participants likely had higher functional status and were younger, possibly affecting the incidence of falls post-discharge (Wagner et al., 2009). In a similar study conducted in Auckland, New Zealand, 1104 stroke survivors were followed for a period of six months, 37% reported at least one fall, 8% of who sustained a fracture. It was found that the majority of falls occurred indoors while at home, and factors associated with falls included depressive symptoms, disability, a history of falls, and older age. Injurious falls occurred more frequently in female stroke survivors and in participants who were dependent before the stroke. Higher levels of activity and normal cognition were factors negatively associated with falls in this population (Kerse et al., 2008). Alemdaroglu, Ucan, Topcuoglu, and Sivas (2012) followed 66 stroke patients from discharge for a period of six months and found that 36% of patients fell within this six month period. They found that patients with left hemispheric stroke showed a four times greater risk of falling within the six month period. Batchelor et al. (2012) suggested that, when considering fall risk for community dwelling stroke survivors, it is important to consider the home environment and how the stroke survivor has to adjust and function within this environment.
In summary, there is currently very limited evidence on what causes falls in stroke survivors throughout the continuum of care. Previous studies have addressed incidence rates and have uncovered potential risk factors that may or may not lead to a fall. These studies have tried to identify risk factors by comparing fallers to non-fallers. The most identified risk factor is dependence in ADLs. Other risk factors include disease-related deficits, such as problems with balance and gait, depression, and cognitive deficits (Weerdesteyn et al., 2008). There is also very limited evidence on what works to prevent falls in the stroke population, because many of the guidelines for falls prevention in this group are based on falls prevention evidence from the general elderly population (Bathelor et al., 2012). Additionally, the majority of studies used retrospective chart reviews as a way of identifying risk factors for falls in stroke patients. Although advantages to using retrospective chart reviews as a research method include the ability to access large amounts of data at a low cost and the ability to study associations over long periods of time, there are limitations to this research method. Limitations include incomplete or missing data, difficulty in interpreting or verifying information, and variability in the quality of documented information by the health care personnel and the researcher collecting the data (inter-rater reliability) (Gregory, & Radovinsky, 2012). Furthermore, the use of retrospective chart reviews runs the risk of hindsight bias, whereby what was known before an incident is overestimated. That is, researchers may suspect that individuals directly involved in the falls incident knew more than they actually did (Woods, & Cook, 1999). In retrospect, things that were not understood or seen at the time of the incident seem obvious. Hindsight bias leads a reviewer to simplify the causes of an accident, often highlighting only single factors that caused the incident and overlooking the interaction of a multitude of contributing factors. This can also lead to blaming individuals, who only acted under the circumstances in which they were placed (Institute of Medicine (IOM), 1999). Also, Batchelor et al. (2012) identified the need for longitudinal studies looking at patterns and causes of falls throughout the care continuum from acute care to stroke rehabilitation to the community. No such study exists, and although previous studies have identified risk factors for falls, none have identified the specific causes and contributing factors that led to a fall in the stroke population. Finally, the main disadvantage of risk factor studies is that they employ a person-centered approach, focused on the characteristics of the faller. However, a fall does not happen in a vacuum, and a more appropriate investigation needs to utilize a systems-approach (Zecevic, Salmoni, Lewko, Vandervoort, & Speechley, 2009).
1.3 Systems approach to the investigation of falls in stroke survivors

Although the risk factors associated with falls in the elderly population in general, and the stroke population in particular, has been extensively studied, these risk assessment studies have focused mainly on the characteristics of the faller, an approach known as a person-centered approach (Zecevic et al., 2009). A person-centered approach focuses on sharp-end factors, or the failures directly related to the individual involved in an adverse event. However, in addition to sharp-end factors, an adverse event (in this case, a fall), also involves blunt-end or latent factors. Blunt-end factors are those latent, system-wide factors that are not directly in the control of the individuals involved. However, through the intertwining and dynamic interactions of contributing factors, these latent, system-wide factors contribute to the adverse event by affecting the actions and decisions of persons involved (Henriksen, Dayton, Keyes, Carayon, & Hughes, 2008). According to Reason (2000), human error results when mental or physical action plans fail and the wrong outcome is achieved. Latent factors such as the work environment, heavy workload, or the structure of an organization are embedded in a system and can worsen over time until the right circumstance arises and an active error occurs (an adverse event such as a fall) (Henriksen et al., 2008). A system is broadly defined as the interaction between a person and the physical and social environment within which that person resides (Zecevic et al., 2009). Many latent factors may exist as an organization continues to adapt and change over time. However, the number of hazards and risks can be greatly reduced if the causes are targeted. “In doing so, the path between active failures when the error occurred would be traced to the latent defects in the organization, indicating leadership, processes, and culture. Then, if organizational factors (e.g., latent factors) become what they should be, few active causes of accidents will come about” (Henriksen et al., 2008, p. 25).

In order to identify contributing factors of accidents, it is necessary to identify safety deficiencies that contributed to falls using a systems approach to human error and accident investigation. In a systems approach, it is an accepted fact that humans commit errors for a variety of complicated reasons. It is the latent errors or system failures that are of interest and
pose the greatest threat to safety, because it is these latent errors that lead to operator or human errors (IOM, 1999; Zecevic et al., 2009). “Latent errors are difficult for the people working in the system to see since they may be hidden in computers or layers of management and people become accustomed to working around the problem” (IOM, 1999, p. 65). In a systems approach to falls investigations, the underlying causes or latent factors that resulted in a fall are seen as deeply embedded in the system. The failure to address these latent factors can make the whole system prone to future failures. Discovering and addressing latent factors has a greater effect on making a system safer than only addressing and often blaming active human failures (IOM, 1999). “Solutions in the systems approach accept that we cannot completely change the human condition but we can change the conditions in which humans operate” (Zecevic et al., 2009, p. 686). Understanding why stroke survivors fall throughout the continuum of care requires a systems approach, because even a seemingly single event such as a fall is the result of the convergence of multiple contributing factors.

1.4 Systemic Falls Investigative Method (SFIM)

Modeled after the Transportation Safety Board of Canada’s Integrated Safety Investigation Methodology (ISIM), the Systemic Falls Investigative Method provides a falls investigator the tools, techniques, and framework for analyzing falls occurrences to better understand the contributing factors, safety deficiencies, and causes that led to the event (Zecevic, Salmoni, Lewko, & Vandervoort, 2007). The SFIM is a six step method developed specifically for the investigation of falls in the elderly population. Although the SFIM was created primarily to investigate falls in community-dwelling seniors, the creators of this tool believe that it can be adapted to more structured settings such as hospitals and long-term care facilities and to specific subgroups of the population (such as stroke survivors) (Zecevic et al., 2007). The SFIM has been used in the past to investigate falls in the community, rehabilitation hospitals, as well as long-term care facilities and nursing homes (Zecevic, Halligan, Kothari, Kloseck, Salmoni & SFIM workgroup, 2010; Zecevic, Li, Davy, Halligan, & Kothari, 2010). However, it has not yet been used to study falls in stroke survivors.

The six steps involved in the SFIM investigative process include: use of the F-SHEL (faller, software, hardware, environment, liveware) data collection tool to plan and collect data
about the fall; developing a sequence of events and identifying the safety significant events; analysis of the safety significant events to identify error types using Generic Error Modeling System (GEMS); putting into context the identified unsafe acts, conditions and decisions using an abbreviated version of the Swiss Cheese Model; summarizing the contributing factors to identify safety deficiencies; and developing safety action suggestions (Zecevic et al., 2007). The SFIM will be discussed in more detailed in the next chapter (Methods). This method is a multidisciplinary investigative method, highly attuned with the multi-factorial nature of falls in the stroke population.

1.5 Study purpose and objectives

A fall is a common adverse event at all stages in the stroke continuum of care. Past studies have focused on risk factors in order to identify high risk patients and have heavily relied on a person-centred approach. A person-centred approach is not appropriate for the study of falls because falls occur in an intricate, interlinked system with multiple players. Using a systems approach to better understand the many contributing factors that lead to a fall allows targeted interventions and the potential to greatly increase the safety of the system within which these stroke survivors function. The purpose of this study was to identify systemic factors of falls in stroke survivors as they transitioned through the stages in the continuum of care, from acute care to rehabilitation to community re-integration or long-term care. Specifically of interest for this research study were the factors that contribute to falls in the various settings, leading to the following research questions:

1. Are there factors contributing to falls that are similar across all settings?
2. Are there factors contributing to falls that are unique to a particular setting?

For the purposes of this study, factors that were similar across all settings had two cut-off points: they were considered similar if they appeared across 80-100% of the cases in all settings; they were considered a frequent contributor to falls if they appeared in 60-79% of the cases in all settings. Factors that appeared in only one setting were noted as being unique to that particular setting.
Specific objectives for this study were to:

- Conduct a prospective case series study using the SFIM to identify safety deficiencies at the four levels of the Swiss Cheese Model of Accident Causation.
- Provide evidence on how the system-wide latent factors combine with the actions of people at the sharp end to cause falls in stroke survivors in all three settings.
- Analyze these fall reports to identify patterns of contributing factors specific to stroke survivors.
- Discuss implications of the identified safety deficiencies and propose recommendations for systemic changes.
Chapter 2

Methods

2.1 Case study research

To better understand the phenomenon of falls within the context of stroke recovery, a prospective case series study was conducted using the SFIM data collection tool. Yin (2009) defines case study research as “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 18). He goes on to say that case study research “relies on multiple sources of evidence, with data needing to converge in a triangulating fashion” (p. 18). A case can be a person or several persons, an intervention, an institution, a process, a program, or an event (Salminen, Harra, & Lautamo, 2006). In this study, a case was the fall incident. Multiple viewpoints, multiple methods of inquiry, and multiple data sources were used for data collection to answer “how” and “why” questions about the phenomenon of falls. Case study research can be helpful in relating theory to practice. It is an especially useful approach when studying problems with a practical implication, such as those found in healthcare safety (Salminen et al., 2006). Case study research does not include large samples, and therefore, it is impossible to generalize case study findings to a population. Instead, it has been suggested that case study research can provide referencing and transferability of conclusions to similar situations. Case studies may provide real life examples to others experiencing a similar incident (Salminen et al., 2006). Case study research has also been criticized for its subjectivity and biased data collection, analysis, and conclusions. However, various techniques such as member checking, comparing views, considering counter-instances, and triangulation can be used to alleviate or minimize biases and subjectivity (Salminen et al., 2006). Triangulation is the use of multiple sources of data to confirm a finding. Each finding needs to have as many confirmations from different sources as possible (Stake, 2006). Triangulation can also mean the use of multiple methods of data collection, and the use of multiple researchers in data collection and data analysis (Salminen et al., 2006).

Case study research is often an intensive and time-consuming process because data is collected from multiple sources in order to fully capture the dynamic complexity of the
phenomenon under investigation. “To fulfill the criteria for scientific research, case study research requires a systematic process of data collection and analysis, high-level ethical decision-making and good reporting” (Salminen et al., 2006, p. 7).

In the present study, all investigations were completed by the researcher and three research assistants. All investigations were completed under the supervision of the creator of the SFIM data collection tool, and all sources of data were triangulated using at least three sources. In addition, reflective journaling, as well as reflective discussions with the supervisor, members of the SFIM research team, and members of the advisory committee were utilized in an attempt to ensure trustworthiness and rigor during the research process (Baxter, & Jack, 2008).

2.2 Procedure

2.2.1 Setting and recruitment

In order to better understand the factors contributing to falls in stroke survivors throughout their recovery, falls investigations took place in three distinct settings across the stroke care continuum: an acute care neurology unit, a stroke inpatient rehabilitation unit, and in the homes of the stroke survivors once they were discharged from either acute care or inpatient rehabilitation. Before commencement of the study, management teams from the two participating hospitals were contacted to collaborate on this research project. They readily agreed to take part and assist with participant recruitment. The management teams acted as gatekeepers and played a critical role in identifying stroke patients who had had a fall. From the acute care hospital, one unit manager, one unit coordinator, one clinical nurse educator, and one neurologist agreed to assist not only with participant recruitment but also with familiarizing the study investigators with the unit staff, environment, culture, and policies and practices. Similarly, the unit coordinator at the inpatient rehabilitation unit took on the role of gatekeeper at the rehabilitation setting. Partnering with these centers allowed us to accurately capture and investigate falls in stroke survivors through the continuum. Although this study was originally designed to investigate falls in the long-term care (LTC) setting as well, the LTC facilities where study participants were sent refused to participate in the study. Therefore, all investigations within the community involve only participants who fell at home and not at a LTC facility.
Finally, it is important to mention that partners within the community, such as the Community Care Access Centre (CCAC) and the Community Stroke Rehabilitation Team (CSRT) also provided us with valuable information and served as major players in our investigations throughout the care continuum. Ethics approval for this study was obtained from the UWO Research Ethics Office and Lawson Health Research Institute/Clinical Research Impact Committee (Appendix A-C).

The path to recovery varies for each stroke survivor and is largely dependent on the severity and location of the stroke. All stroke survivors start off in an acute care hospital, the starting and recruitment point in this study. From there, some continue onto the inpatient stroke rehabilitation setting and, once they are deemed ready, they are discharged back into the community (either home or a LTC facility). Others, who are not severely disabled by their stroke, are able to return home or to a LTC facility after acute care.

2.2.2 Participants

2.2.2.1 Primary participants

The primary participants in this study were the stroke survivors who experienced a fall at any of the three settings. From December 2011 to November 2012, all patients who had suffered from a stroke and who were admitted to the neurology inpatient unit were screened for inclusion into the study. All patients who had suffered from an ischemic stroke, a hemorrhagic stroke, or a transient ischemic attack (TIA) were identified upon admission. Before approaching patients for consent, the investigative team spoke with the patient’s healthcare team to confirm the diagnosis, get a better understanding of the cognitive state of the individual, as well as to learn about their prognosis. Once the healthcare team confirmed the stroke diagnosis and agreed that they were suitable for the study, the investigative team approached the patient with a letter of information and consent form (Appendix D-E). In cases where the patient was unable to provide his/her consent due to cognitive impairment, the substitute decision maker was asked to give consent. Upon receiving consent, participants were monitored for a period of six months. Patients were excluded from the study if they did not suffer from a stroke. It is important to note that during the
recruitment process, due to the acuteness of the illness, a firm diagnosis was often not confirmed until many diagnostic tests were completed. Therefore, at times patients who were thought to have suffered from a stroke were later found to have, in actuality, suffered from a different neurological disorder and had to be excluded from the study. Patients were also excluded from the study if they were not willing to sign the written consent form.

If a fall occurred within either hospital setting or community setting within the six month period, the stroke survivor was enrolled into the study and a falls investigation was conducted. When an adverse event took place in the hospital, unit coordinators and managers received an adverse event report form, filled out by staff who had witnessed the event or were directly involved. Once the gatekeepers received these adverse event reports, they immediately contacted the study investigative team to inform us of a fall. Once participants were discharged back into the community, they were placed on a weekly call list. These participants were contacted by telephone twice a week to inquire about any falls or near falls while at home.

2.2.2.2 Secondary sources of information

In addition to interviewing the stroke survivor, individuals who were directly or indirectly involved in the fall incident were also interviewed. These individuals included family members and hospital staff such as nurses, doctors, physiotherapists, occupational therapists, personal support providers, managers, and coordinators. All secondary participants were approached for consent to participate in the investigations (Appendix F-G). Any additional sources of information, such as policies, government documents, manufacturer manuals, and best practice guidelines, were also used in the investigations. Many of the secondary sources of information were identified during weekly data analysis meetings with the SFIM investigative team.

2.2.2.3 SFIM Research team

The SFIM investigative team consisted of six researchers: the original creator of the SFIM tool, Dr. A. Zecevic, an occupational therapist also working on a similar study using the SFIM, and four graduate research assistants. All members of the team were trained on the use of the SFIM tool and the SFIM database during a two-day long training session conducted by Dr. A. Zecevic. The team met once a week to discuss new investigations, to brainstorm, and to
analyze the data gathered. These brainstorming sessions led to the generation of more questions, which directed the path of the investigations. Primary investigators for each case would then continue with the investigation with a new set of ideas and questions to further explore. This process was repeated until it was felt that the investigation had reached a conclusion and a significant amount of detail had been gathered.

2.3 Data Collection

The Systemic Falls Investigative Method (SFIM) was used as the data collection tool for this study. The SFIM has been used in the past to investigate falls in the community, rehabilitation hospitals, as well as long-term care facilities and nursing homes (Zecevic, Halligan et al., 2010; Zecevic, Li et al., 2010). It has been shown to be an effective tool for the identification of systemic contributing factors and causes of falls. A two-day SFIM training workshop was held in October 2011. During this workshop five researchers were trained on how to use the SFIM data collection tool and the web-based SFIM database. Four separate presentations on the study purpose and objectives were given to the staff at the acute care setting in November 2011. Two additional presentations were presented to the staff at the inpatient stroke rehabilitation unit.

Recruitment of study participants began December 2011. Stroke survivors in the inpatient acute care hospital were identified through either the admissions binder or the electronic patient records system and approached for consent.

Sixty-eight stroke patients from the acute care hospital provided informed consent and hence were recruited into the study. These patients were monitored for falls and followed through their progression in stroke recovery. A neon-coloured sticker, informing staff of the patient’s recruitment into the falls study, was placed on the patient chart or nurse’s Kardex (a card-filing patient information system that allows for quick referencing to patient medical information for nursing care). This sticker also provided the investigator’s telephone number in case of a fall.

The unit coordinators at each hospital received adverse event reports when an adverse event took place. If the adverse event was a fall, the coordinators informed the study investigator through email or a telephone call. This process was done at both hospital sites. This allowed for
investigations to take place in a very timely manner, permitting the research team to gather more accurate information. Weekly telephone calls were also made to recruited patients who had been discharged home or to LTC to learn of any falls that had taken place in the previous week in the community setting.

After learning of a fall, the study investigator informed other members of the team. Two or three members of the team then traveled to the site of the fall and initiated an investigation. Prior to beginning the investigation, the investigator either approached the patient for consent, if consent had not already been obtained, or revisited consent to participating in the study, just in case participants had changed their minds. Once consent was obtained, the Mini-Mental State Exam (MMSE) (Appendix H) was completed or the score was collected from the patient’s hospital records. Next, a participant contact form was filled out (Appendix I) for the purposes of weekly telephone calls. If a MMSE score was missing, researchers recorded the MoCA score.

2.4 Systemic Falls Investigative Method

The Systemic Falls Investigative Method is a data collection and integration tool that is divided into six steps (Zecevic et al., 2009). The first two steps involve a continuous, iterative process of reflexivity, triangulation, and generation of further questions. This process continues until the data collected has sufficient depth and detail to provide an accurate summary of the event, represented in a sequence of events. The six steps of the SFIM are as follows:

**Step one:** Completion of a semi-structured interview at the location where the fall occurred (acute care stroke unit, stroke rehabilitation unit, home of the faller or long-term care facility where faller resides). The initial interview was conducted with the faller and/or the care provider. If a participant was cognitively impaired and unable to provide information or recall the circumstances accurately, additional interviews were conducted with healthcare staff and family members. Additionally, information was always confirmed by reviewing patient charts where all adverse events had to be documented. This provided us with some details surrounding the fall such as the location and specific time of the incident.
The objective of the interview was to collect data using the F-SHEL framework:

F—facts about the fallers; includes their physical, physiological, psychological and psychosocial characteristics;

S—software; includes training, policies and procedures, manuals, and/or checklists that were in place, either for the care procedures of the faller or for any equipment that was in use;

H—hardware; includes equipment used, mobility aids, transfer aids, bath aids, layout of items, display screens, and footwear used by individuals involved at the time of the fall;

E—faller’s environment; includes internal conditions such as lighting, temperature, noise, floor conditions and external environment such as weather, and community conditions/particularities;

L—liveware surrounding the faller; includes the other people involved, witnesses, healthcare providers and agencies, other family members, peoples’ attitudes, social networks, and communication.

All interviews were audio recorded unless the person being interviewed requested not to be recorded. In addition, photos were taken of the environment where the fall took place and any pertinent aids used at the time. All information gathered from the interviews and chart reviews was taken back to the research office where two researchers recreated the event. Initial interviews with any identified participant took an average of 30-120 minutes. During step one, the faller’s past medical history, medications, and any other relevant information pertaining to the fall was also collected.

**Step two:** Develop the sequence of events that led up to the event. This step was initiated by the researcher who was assigned to each case (cases were divided amongst four research assistants). A chronological hypothesis of the sequence of events that led to the fall was developed after the initial gathering of information. The preliminary sequence of events was presented to the SFIM research group at the weekly meetings, where researchers worked together to establish more questions and hypotheses and identify gaps in the sequence of events.
The sequence of events was then revised and confirmed through additional data collection, and the events that were safety-significant were identified. Safety significant events (SSEs) were acts and decisions that directly contributed to the adverse event. SSEs were determined by answering the following questions about each event in the sequence:

- Was this task undesirable?
- Was this task non-standard?
- Was this task linked or potentially linked to another undesirable event?
- Was this task one of alternative actions or options available?

If the answer was ‘yes’ to any of the questions, the act was classified as a SSE. Each SSE was then examined more closely by asking further questions regarding the “why”. For example: Why was this task undesirable? The “why” questions uncovered further need for data collection and led to interviews with additionally identified secondary participants, further observations, or further review of additional data sources, such as written materials on policies or medical records. Follow-up interviews were completed at the hospitals, over the phone, or by email, depending on the participants’ preferences and the nature of the information required. Once additional information was collected and the sequence of events clarified, the SFIM research group reviewed the description of the final sequence of events for thoroughness and depth. The description of the sequence of events was reviewed by the research group an average of two times, but often times three to four times, before all members were satisfied. A narrative summary of the fall was then written by the investigator and the de-identified data were entered into the SFIM database. Data in the SFIM database is de-identified and stripped of any personal identifiers and assigned a unique code. The SSEs were further analyzed in step three.

**Step three:** Generic Error Modeling System (GEMS). In the SFIM, unsafe acts and decisions are analyzed further using the Generic Error Modeling System (GEMS) (Reason, 1987). This system of modeling human error was used to determine:

- the mindset of the person at the time of the event
- if the error was skill-based, rule-based, or knowledge-based
- which failure mode corresponded to a skill-based slip or lapse: inattention or over-attention
• which failure mode corresponded to a rule-based or knowledge-based mistake: misapplication of good rules, application of a bad rule, biases, or heuristics?
• which failure modes corresponded to a knowledge-based adaptation: biases or heuristics?

More detailed description of GEMS analysis is available in Reason (1987). The GEMS analysis was completed by A. Zecevic for all cases as part of a larger study, and the results will not be presented in this study.

**Step four:** Swiss cheese Model of Accident Causation analysis. The fourth step of the SFIM puts the contributing factors identified in step two into context of the Swiss Cheese Model of Accident Causation developed by Reason (1990) and adapted for the SFIM by Zecevic et al. (2007). The four levels of this model include: unsafe acts and decisions, preconditions, supervision factors, and organizational factors. According to Reason (1990), most accidents can be traced back to one or more of the four levels of failure: unsafe acts, preconditions, unsafe supervision or organizational factors. In this model, the slices of Swiss cheese represent an organization’s defenses against failure, and the holes represent weaknesses in each of the four levels of defense. These weaknesses or ‘holes’ in the Swiss cheese are continually varying in position and/or size, and only when the holes in the cheese momentarily align, does an accident or failure, such as a fall, occur (Zecevic et al., 2007).
Step five: Identifying Safety Deficiencies and Risk Assessment. A within-case study analysis was conducted to identify the unsafe conditions and underlying factors.

Step six: Development of safety actions. The final step in SFIM investigative process is to develop safety actions. The job of the SFIM investigator was to find what went wrong and inform those directly involved with patient safety either in the hospital setting (Quality care control team or unit managers) or community service providers (Community Care Access Centre and Community Stroke Rehabilitation Team). Knowledge translation activities involve the sharing of the comprehensive SFIM reports with these patient safety teams.
2.4.1 SFIM Database

All information collected as part of the falls investigation was de-identified and entered into a web-based database. Information entered into the database included facts about the faller and the fall, as well as a chronological sequence of events. Information about the faller and the fall was inputted into appropriate boxes. Several variables and rating scales (normally found in the fallers’ medical records) were also part of the data input process (e.g., MoCA scores, FIM scores, MMSE scores, and rate of falls). The database automatically generates sequence of events diagrams based on the information provided by the investigators and full case reports which include the Swiss cheese tables. Full case reports can be seen in Appendix K.

2.5 Data Analysis

Data analysis occurred in two stages. The first was a within-case analysis that took place during the SFIM investigation process, as described above. The data collected from interviews and other sources were reviewed and discussed with members of the SFIM research team. This allowed for multiple perspectives, generation of hypothesis, and formulation and expansion of the list of contributing factors. Each contributing factor was further analyzed for placement within the Swiss Cheese Model of Accident Causation. Upon completion of the investigation, a secondary reviewer thoroughly reviewed the final report and sequence of events of each case study for accuracy, consistency, coherence, and quality.

The second phase of data analysis focused on similarities and patterns between case studies. Twenty-two tables of contributing factors were analyzed using content analysis. This process involved four researchers and two cycles of analysis. The first stage of this analysis involved line by line coding of the Swiss cheese tables, independently completed by four researchers. These codes were then amalgamated into a single coding list and all researchers met to discuss the final code list, to establish consensus, and to ensure that the list was exhaustive and that each code was clearly defined (French, Reynolds, & Swain, 2001). Once the amalgamated coding list was completed, two researchers independently re-coded all contributing factors. Some minor discrepancies were noted and the code list was slightly adjusted and definitions clarified to ensure consensus for a final code list (Appendix J).
Chapter 3

3 Results

In total, 68 stroke survivors were recruited from the acute care stroke unit. From these 68 consented participants, 28 falls occurred by 25 participants, four participants were excluded because they were transferred to hospitals outside the research area, and 2 falls were excluded due to insufficient data. These two falls occurred in LTC facilities and investigations commenced, however, for unknown reasons, the LTC facilities declined to participate in the study and investigations had to be terminated. Therefore, a total of 22 falls by 21 stroke survivors (one participant fell twice: once in acute care and once in inpatient stroke rehabilitation) were investigated. The breakdown of these case study investigations were as follows: six in acute care, ten in the rehabilitation unit, and six in the community. All six cases from the community setting took place within the fallers’ homes.

In this section an overview of the faller’s characteristics are presented, as well as characteristics of secondary sources of information and characteristics of the investigated falls. Next, three case report narrative summaries and conclusions are presented, one from each setting. Finally, an overview of the contributing factors is given, followed by a presentation of codes that were similar across all settings and those that were unique to a particular setting.

3.1 Characteristics of the faller

In total 22 falls investigations were completed. One participant experienced two falls in separate locations, each of which was investigated as a separate case study.

Participants ranged in age from 43 to 98 years, with an average age of 66 years. Table 1 describes characteristics of the fallers, grouped together based on location of fall (first six from acute care, next ten from stroke rehabilitation, and the final six from home). Each faller is identified with a unique database code number. Overall, there were 14 males (one participant fell twice) and seven females included in the study. Eleven suffered from confusion at the time of the fall; nine were clinically diagnosed with depression; one suffered from dementia; and five were noted as having high levels of agitation. Eleven participants had a history of falling. Fourteen fallers were married, three were divorced, two were
widowed, and two were single. Only one faller self-identified as having a fear of falling. Fifteen fallers had to use a wheelchair; seven fallers suffered from osteoarthritis and one from rheumatoid arthritis; ten suffered from muscle deconditioning; seven had Type 2 diabetes; and two suffered from regular dizzy spells. Seven suffered from incontinence, nineteen from general muscle weakness, nine from regular pain, one from Parkinson’s disease, and two from seizures. An average of ten medications was prescribed to each participant (range 2-27).
<table>
<thead>
<tr>
<th>Case Code</th>
<th>Sex</th>
<th>Age</th>
<th>Cognitive Status</th>
<th>MMSE score /30</th>
<th>MoCA score /30</th>
<th>FIM score /126</th>
<th>No. of meds</th>
<th>Falls history</th>
<th>Mobility aids used at time of fall (usual mobility aid used)</th>
<th>Medical problems at time of fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>16336</td>
<td>F</td>
<td>55</td>
<td>Confused, disoriented, impulsive</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>11</td>
<td>Multiple faller (falls regularly)</td>
<td>None (Wheelchair, assistance by others)</td>
<td>Deconditioning, incontinence, Rheumatoid arthritis, muscle weakness, aphasia</td>
</tr>
<tr>
<td>16272</td>
<td>F</td>
<td>55</td>
<td>Depressed</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6</td>
<td>Rare faller</td>
<td>None (Wheelchair, assistance by others)</td>
<td>Depression, incontinence, muscle weakness, cerebellar mutism</td>
</tr>
<tr>
<td>16763</td>
<td>M</td>
<td>71</td>
<td>Confused, disoriented, depressed</td>
<td>N/A</td>
<td>21</td>
<td>N/A</td>
<td>11</td>
<td>Rare faller</td>
<td>Wheelchair (assistance by others)</td>
<td>Osteoarthritis, depression, incontinence, muscle weakness, obstructive sleep apnea</td>
</tr>
<tr>
<td>16774</td>
<td>M</td>
<td>66</td>
<td>Confused, disoriented, depressed, isolated, agitated, aggressive, combative</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>7</td>
<td>Multiple faller (falls regularly)</td>
<td>Walker (assistance by others)</td>
<td>Deconditioning, depression, muscle weakness, pulmonary disease, aphasia</td>
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<tr>
<td>ID</td>
<td>Age</td>
<td>Gender</td>
<td>Clinical Description</td>
<td>Fall History</td>
<td>Assistive Devices</td>
<td>Comorbidities</td>
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<td>16960</td>
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<td>M</td>
<td>Confused, disoriented, agitated, aggressive, combative</td>
<td>N/A</td>
<td>N/A</td>
<td>Rare faller (fell only this one time in the past year)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No (Wheelchair, assistance by others)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Muscle weakness, pain, multiple sclerosis</td>
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<td>16961</td>
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<td>M</td>
<td>Confused, disoriented, depressed</td>
<td>N/A</td>
<td>N/A</td>
<td>Occasional faller (fell more than once in past year)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No (Walker)</td>
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<td></td>
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<tr>
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<td></td>
<td></td>
<td>Depression, incontinence, muscle weakness, Parkinson’s disease, aphasia</td>
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<tr>
<td>14770</td>
<td>66</td>
<td>M</td>
<td>Confused, disoriented, had difficulty finding words</td>
<td>16</td>
<td>22</td>
<td>Occasional faller</td>
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<td></td>
<td>18</td>
<td>27</td>
<td>Wheelchair (assistance by others)</td>
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<td></td>
<td></td>
<td>Anxiety, muscle weakness, osteoarthritis, deconditioning, pain</td>
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</tr>
<tr>
<td>16433</td>
<td>50</td>
<td>M</td>
<td>Agitated, combative, aggressive, frustrated, alert and oriented, isolated and depressed</td>
<td>23</td>
<td>14</td>
<td>Rare faller</td>
<td></td>
<td></td>
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<td></td>
<td>44</td>
<td>5</td>
<td>Wheelchair (assistance by others)</td>
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<td>Deconditioning, depression, incontinence, muscle weakness, pain</td>
<td></td>
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</tr>
<tr>
<td>16767</td>
<td>62</td>
<td>M</td>
<td>Normal, alert, oriented, inconsistently follows commands</td>
<td>27</td>
<td>24</td>
<td>Rare faller</td>
<td></td>
<td></td>
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<td></td>
<td>54</td>
<td>13</td>
<td>Wheelchair (assistance by others)</td>
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<td></td>
<td></td>
<td>Deconditioning, depression, muscle weakness</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16777</td>
<td>54</td>
<td>M</td>
<td>Normal, alert, oriented, impulsive, depressed</td>
<td>N/A</td>
<td>24</td>
<td>Occasional faller</td>
<td></td>
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<td>56</td>
<td>Wheelchair (assistance by others)</td>
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<td>Depression, muscle weakness, pain, multiple sclerosis</td>
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<tr>
<td>17698</td>
<td>57</td>
<td>M</td>
<td>Confused, disoriented, agitated, aggressive, combative</td>
<td>N/A</td>
<td>N/A</td>
<td>Multiple faller (falls regularly)</td>
<td></td>
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<td></td>
<td>Wheelchair (assistance by others)</td>
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<td>Deconditioning, muscle weakness, incontinence, pain</td>
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</tr>
<tr>
<td>ID</td>
<td>Gender</td>
<td>Age</td>
<td>Medical Status</td>
<td>Fall Frequency</td>
<td>Fall Mechanism</td>
<td>Other Conditions</td>
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<tr>
<td>18675</td>
<td>M</td>
<td>69</td>
<td>Normal, alert and oriented, does not speak English</td>
<td>N/A</td>
<td>6</td>
<td>21 18 Occasional faller Wheelchair (assistance by others) Osteoarthritis, deconditioning, muscle weakness</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17915</td>
<td>M</td>
<td>58</td>
<td>Agitated, aggressive, combative, confused and disoriented</td>
<td>21</td>
<td>14</td>
<td>37 5 Rare faller Wheelchair (assistance by others) Muscle weakness</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17914</td>
<td>F</td>
<td>98</td>
<td>Confused and disoriented</td>
<td>15</td>
<td>8</td>
<td>N/A 4 Occasional faller Wheelchair (assistance by others) Muscle weakness, memory loss, osteoarthritis</td>
<td></td>
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</tr>
<tr>
<td>18303</td>
<td>F</td>
<td>74</td>
<td>Normal, alert, oriented</td>
<td>30</td>
<td>N/A</td>
<td>N/A 11 Rare faller None (wheelchair, assistance by others) Deconditioning, muscle weakness, pain</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18677</td>
<td>F</td>
<td>63</td>
<td>Normal, alert, oriented, depressed</td>
<td>N/A</td>
<td>N/A</td>
<td>25 11 Unknown Wheelchair (assistance by others) Depression, muscle weakness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16776</td>
<td>M</td>
<td>62</td>
<td>Normal, alert, oriented, depressed</td>
<td>N/A</td>
<td>25</td>
<td>121 10 Occasional faller None (rollator walker) Osteoarthritis, depression, muscle weakness, seizures, syncope</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16958</td>
<td>M</td>
<td>43</td>
<td>Normal, alert, oriented, fear of falling</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A 2 Rare faller None (cane, assistance by others) Muscle weakness, deconditioning, left hemiplegia, left visual neglect</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16959</td>
<td>F</td>
<td>96</td>
<td>Normal, alert, oriented</td>
<td>27</td>
<td>N/A</td>
<td>N/A 9 Occasional faller None (rollator walker) Osteoporosis, pain, spontaneous fractures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Gender</td>
<td>Age</td>
<td>Status</td>
<td>Falls</td>
<td>Cane Assistance</td>
<td>Conditions</td>
<td></td>
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</tr>
<tr>
<td>17918</td>
<td>M</td>
<td>73</td>
<td>Confused, disoriented, diagnosed with dementia</td>
<td>19</td>
<td>N/A</td>
<td>Multiple faller, Cane (assistance by others), Osteoarthritis, dementia, hypoglycemia, muscle weakness, seizures, insomnia</td>
<td></td>
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</tr>
<tr>
<td>18758</td>
<td>F</td>
<td>55</td>
<td>Normal, alert, oriented</td>
<td>N/A</td>
<td>N/A</td>
<td>Occasional faller, None (assistance by others), Vertigo, osteoarthritis, pain, generalized anxiety disorder</td>
<td></td>
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</tr>
<tr>
<td>17917</td>
<td>M</td>
<td>65</td>
<td>Normal, alert, oriented, depressed</td>
<td>N/A</td>
<td>N/A</td>
<td>Occasional faller, None (cane or rollator walker), Osteoarthritis, deconditioning, depression, hypoglycemia, vertigo, incontinence, muscle weakness, pain</td>
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</tr>
</tbody>
</table>
3.2 Characteristics of secondary participants and secondary sources of information

Secondary participants and secondary sources of information included family members; healthcare providers such as nurses, physicians, physiotherapists, occupational therapists, personal support workers/personal care providers, unit coordinators and managers, nurse educators, Community Care Access Centre (CCAC) and Community Stroke Rehabilitation Team (CSRT) case managers; as well as representatives from manufacturers of beds and restraints; Health Canada documents; Best Practice Guidelines for Stroke Care, Nursing Care, and Pressure Ulcer Care; and hospital policies. Table 2 provides a summary of secondary participants and secondary sources of knowledge used for each case.
<table>
<thead>
<tr>
<th>Case Code</th>
<th>Secondary Participants</th>
<th>Additional Sources of Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>16336</td>
<td>Husband, sister-in-law, night shift nurse, day shift nurse, unit coordinator, clinical nurse educator, physiotherapist (PT), unit clerks</td>
<td>Medical chart, hospital policy on restraint use, adverse event report, Best Practice Guidelines for stroke care (BPGs Stroke)</td>
</tr>
<tr>
<td>16272</td>
<td>Husband, occupational therapist (OT), nurse, clinical nurse educator, second year nursing student, unit coordinator, Hill-Rom® representative to acute care hospital, unit clerks</td>
<td>Medical chart, hospital policy on restraint use, bed manufacturer's website and bed manual, BPGs Stroke</td>
</tr>
<tr>
<td>16763</td>
<td>Daughter, nurse, OT, PT, nurse from skin/wound/ostomy team (SWOT), clinical nurse educator</td>
<td>Medical chart, hospital policy on restraint use, hospital policy on SWOT consultation, Best Practice Guidelines for Pressure sores, BPGs Stroke</td>
</tr>
<tr>
<td>16774</td>
<td>Daughter, nurse, PT, unit coordinator</td>
<td>Medical chart, hospital policy on managing abusive and inappropriate behaviours, BPGs Stroke</td>
</tr>
<tr>
<td>16960</td>
<td>Wife, unit coordinator, 3 nurses, clinical nurse educator</td>
<td>Health Canada website, Pinel® restraint system website, Segufix® restraint system website, hospital policy on restraints, BPGs Stroke, adverse event report</td>
</tr>
<tr>
<td>16961</td>
<td>Daughter, nurse, PT, unit coordinator, clinical nurse educator, neurologist</td>
<td>Medical chart, hospital policy on restraint use, BPGs Stroke, adverse event report</td>
</tr>
<tr>
<td>14770</td>
<td>Wife, daughter, unit coordinator, PT, 2 nurses, OT, OT assistant (OTA)</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>16433</td>
<td>2 nurses, PT, OT, unit coordinator</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>16767</td>
<td>Nurse, PCP, unit coordinator, OT</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>16777</td>
<td>Wife, unit coordinator, nurse, Personal Care Provider (PCP), PT, OT</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>17698</td>
<td>Wife, son, nurse, PT, OT, unit coordinator</td>
<td>Medical chart, hospital policy for managing abusive and inappropriate behaviour, BPGs Stroke</td>
</tr>
<tr>
<td>17914</td>
<td>Two Nurses, Clinical nurse educator in charge of falls prevention for hospital, unit coordinator, PT, OT</td>
<td>Medical chart, hospital policy for repair of assistive devices, BPGs Stroke</td>
</tr>
<tr>
<td>ID</td>
<td>Relationship &amp; Profession</td>
<td>Resources</td>
</tr>
<tr>
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</tr>
<tr>
<td>18675</td>
<td>Son, nurse, PT, OT, PCP, unit coordinator</td>
<td>Medical chart, hospital policy for translators</td>
</tr>
<tr>
<td>17915</td>
<td>Nurse, wife, charge nurse, unit coordinator, PT</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>18303</td>
<td>PCP, unit coordinator, Occupational Health specialist</td>
<td>Medical chart, hospital policy on adjusted workload and maternity leave, Ontario Nurses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Association website, BPGs Stroke</td>
</tr>
<tr>
<td>18677</td>
<td>Husband, unit coordinator, nurse, PT, OT, Social worker, clinical nurse educator for falls prevention</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>16776</td>
<td>Fiancé, nurse from epilepsy unit</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
<tr>
<td>16959</td>
<td>Son, PT and Personal Support Worker (PSW) from CCAC, CCAC case manager, family physician, OT</td>
<td>Medical chart, BPGs Stroke, CCAC patient records, condominium developer’s website (for layout of faller’s apartment)</td>
</tr>
<tr>
<td>16958</td>
<td>Wife, farm helper, CCAC case manager, PT and PSW from CCAC, CSRT case manager, brother and sister-in-law, OT</td>
<td>Medical chart, BPGs Stroke, CCAC and CSRT website and policies on triage of stroke patients in the community</td>
</tr>
<tr>
<td>17918</td>
<td>Wife, CCAC case manager and PT</td>
<td>Medical chart, BPGs Stroke, Alzheimer’s Society website</td>
</tr>
<tr>
<td>18758</td>
<td>CCAC case manager, PT and OT, ophthalmologist, daughter, former CCAC case manager assistant</td>
<td>Medical chart, BPGs Stroke, CCAC policy on home safety assessments</td>
</tr>
<tr>
<td>17917</td>
<td>Wife, CCAC case manager, PT and OT</td>
<td>Medical chart, BPGs Stroke</td>
</tr>
</tbody>
</table>
3.3 Characteristics of falls investigated

A total of 22 falls by 21 stroke survivors were examined for this study. If a stroke survivor fell more than once in one setting, only the most recent fall was investigated. Within the acute care setting, half of the falls occurred in the early hours of the morning, while the other half occurred in the afternoon. In the acute care setting, all falls took place in the patients’ hospital rooms and all were the result of attempting an unsupervised, independent transfer. Something new or unusual (for example, a new activity, new environment, and a new nurse) was present in five out of six cases and only one fall resulted in minor injuries (bruises/scrapes).

In the rehabilitation hospital, half of the falls occurred in the morning and half in the afternoon or evening. In this setting, seven out of ten falls occurred during one of the scheduled nursing shift changes. Seven falls occurred in the patients’ rooms and three in the washroom. Seven falls were the result of independent transfers, six of which were unsupervised and one supervised. Two falls occurred during supervised, assisted transfers, during which the faller reacted impulsively. Two were the result of a buckled knee and one was the result of poor sitting posture (slouching, sliding on wheelchair). Six out of ten falls resulted in minor injuries.

Finally, in the home setting, all but one fall occurred during the afternoon/evening period. Four took place in the faller’s den, one in the bathtub, and one on the driveway of the faller’s home. In two cases, the fallers experienced vertigo before the loss of balance; in two cases, the fallers experienced a loss of consciousness; and in three cases the faller was rushing to complete a task. There was something new or unusual in three out of six cases. Three out of six cases resulted in injury, two moderate and one severe, requiring admission to the hospital. Table 3 provides a detailed view of each fall investigated.
<table>
<thead>
<tr>
<th>Case Code</th>
<th>Age</th>
<th>Fall Location</th>
<th>Time of Fall</th>
<th>Activity at time of fall</th>
<th>Something new or unusual</th>
<th>Injury sustained</th>
</tr>
</thead>
<tbody>
<tr>
<td>16336</td>
<td>55</td>
<td>Acute care hospital room</td>
<td>05:20</td>
<td>Sitting on edge of bed, trying to stand independently.</td>
<td>Yes. First time night RN taking care of faller.</td>
<td>No.</td>
</tr>
<tr>
<td>16272</td>
<td>55</td>
<td>Acute care hospital room</td>
<td>13:45</td>
<td>Rising from chair, attempting to get into bed independently.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>16763</td>
<td>71</td>
<td>Acute care hospital room</td>
<td>12:22</td>
<td>Over-reaching from wheelchair, attempting to pull himself onto bed independently.</td>
<td>Yes. First time RN taking care of faller; first time faller attempted to transfer independently.</td>
<td>No.</td>
</tr>
<tr>
<td>16774</td>
<td>66</td>
<td>Acute care hospital room</td>
<td>15:55</td>
<td>Walking with walker, attempting to transfer to bed independently.</td>
<td>Yes. Walker was new.</td>
<td>No.</td>
</tr>
<tr>
<td>16960</td>
<td>54</td>
<td>Acute care hospital room</td>
<td>06:31</td>
<td>Attempting to rise out of bed, attempting to undo restraints.</td>
<td>Yes. First time RN was taking care of faller; hospital fire alarm went off.</td>
<td>Yes. Minor abrasion/scrape on right hip.</td>
</tr>
<tr>
<td>Patient</td>
<td>Age</td>
<td>Location</td>
<td>Time</td>
<td>Event</td>
<td>Description</td>
<td>Notes</td>
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</tr>
<tr>
<td>16961</td>
<td>84</td>
<td>Acute care hospital room</td>
<td>03:30</td>
<td>Attempting to leave hospital room independently.</td>
<td>Yes. A feeding tube was inserted into faller the day before the fall; first time faller attempted to transfer independently.</td>
<td>No.</td>
</tr>
<tr>
<td>14770</td>
<td>66</td>
<td>Rehab hospital room</td>
<td>12:45</td>
<td>Attempting to transfer into bed from wheelchair independently.</td>
<td>Yes. Attempting an independent transfer for the first time without supervision.</td>
<td>Yes. Minor abrasion/laceration to right knee.</td>
</tr>
<tr>
<td>16433</td>
<td>50</td>
<td>Rehab hospital room</td>
<td>13:00</td>
<td>Attempting to transfer into bed from wheelchair independently.</td>
<td>Yes. Attempting an independent transfer for the first time without supervision.</td>
<td>Yes. Minor abrasion/bruise to right elbow and torso.</td>
</tr>
<tr>
<td>16767</td>
<td>62</td>
<td>Rehab hospital washroom</td>
<td>10:30</td>
<td>Rising from wheelchair to use toilet, right knee buckled.</td>
<td>Yes. First time RN was taking care of faller.</td>
<td>No.</td>
</tr>
<tr>
<td>16777</td>
<td>54</td>
<td>Rehab hospital room</td>
<td>19:30</td>
<td>Quickly rising from wheelchair to transfer to bed, PCP was unable to hold onto faller.</td>
<td>Yes. First time PCP is assisting this patient with a transfer.</td>
<td>Yes. Minor pain in left arm/elbow.</td>
</tr>
<tr>
<td>17698</td>
<td>57</td>
<td>Rehab hospital room</td>
<td>07:20</td>
<td>Attempting to leave room independently, slipped on floor.</td>
<td>No.</td>
<td>Yes. Minor bruise on lower back and left hip.</td>
</tr>
<tr>
<td>Date</td>
<td>Age</td>
<td>Location</td>
<td>Time</td>
<td>Event Description</td>
<td>Transfer Attempt</td>
<td>Fall</td>
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<tr>
<td>17914</td>
<td>98</td>
<td>Rehab hospital washroom</td>
<td>09:55</td>
<td>Attempting to transfer from wheelchair to toilet independently.</td>
<td>No.</td>
<td>Yes.</td>
</tr>
<tr>
<td>18675</td>
<td>69</td>
<td>Rehab hospital room</td>
<td>11:00</td>
<td>Sitting in wheelchair, sliding down and forward to alleviate pain.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>17915</td>
<td>58</td>
<td>Rehab hospital room</td>
<td>15:05</td>
<td>Attempting to transfer from wheelchair to bed independently.</td>
<td>Yes. First time faller attempted an independent transfer.</td>
<td>No.</td>
</tr>
<tr>
<td>18303</td>
<td>74</td>
<td>Rehab hospital washroom</td>
<td>07:30</td>
<td>Attempting to pivot onto toilet from wheelchair, independently, left knee buckled.</td>
<td>Yes. First time PCP assisting faller with a transfer.</td>
<td>Yes.</td>
</tr>
<tr>
<td>18677</td>
<td>63</td>
<td>Rehab hospital room</td>
<td>12:35</td>
<td>Attempting to transfer independently to bed from wheelchair.</td>
<td>Yes. First time faller was feeling ill (complained of stomach pain) and out of character (depressed).</td>
<td>No.</td>
</tr>
<tr>
<td>16776</td>
<td>62</td>
<td>Faller home-den</td>
<td>21:30</td>
<td>Walking from kitchen to den, faller felt dizzy and lost consciousness.</td>
<td>No.</td>
<td>No.</td>
</tr>
<tr>
<td>ID</td>
<td>Age</td>
<td>Location</td>
<td>Time</td>
<td>Event</td>
<td>Medical Notes</td>
<td></td>
</tr>
<tr>
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<tr>
<td>16959</td>
<td>96</td>
<td>Faller’s home-den</td>
<td>15:57</td>
<td>Faller bent forward and down (over-reach) to place a blanket on her son sleeping on the floor.</td>
<td>Yes. First time faller’s son was napping on the floor in den. Yes. Moderate (required medical attention); sprained left foot.</td>
<td></td>
</tr>
<tr>
<td>16958</td>
<td>43</td>
<td>Faller’s home-den</td>
<td>15:00</td>
<td>Faller rushed to close door, did not see baby crawling on floor behind arm chair.</td>
<td>Yes. First time faller was supervising children while wife was in another room. No.</td>
<td></td>
</tr>
<tr>
<td>17918</td>
<td>73</td>
<td>Faller’s home-driveway</td>
<td>14:15</td>
<td>Faller rushed to check mailbox across the street, tripped over own foot.</td>
<td>Yes. First time faller attempted to check the mail since being discharged home. Yes. Serious (required substantial medical attention-EMS); subdural hematoma, bruise on left leg and arm, bump on head, laceration above the left eye, pain.</td>
<td></td>
</tr>
<tr>
<td>18758</td>
<td>55</td>
<td>Faller’s home-bathtub</td>
<td>11:00</td>
<td>Faller was showering, while eyes closed, faller turned to face water, felt dizzy and lost balance, grabbed onto shower curtain and fell out of tub.</td>
<td>No.</td>
<td></td>
</tr>
<tr>
<td>17917</td>
<td>65</td>
<td>Faller’s home-den (in basement)</td>
<td>18:40</td>
<td>Faller was rushing up the stairs to get to the washroom, lost consciousness, fell backwards.</td>
<td>No.</td>
<td></td>
</tr>
</tbody>
</table>

Yes. Moderate (but faller did not seek medical attention); large laceration on back.
3.4 Narrative case summaries

Full-case reports for each investigation, generated by the SFIM database, are presented in Appendix K. Three within-case analysis summaries (one from each setting), describing the multitude of contributing factors and how they combined to lead to a fall are presented here.

3.4.1 Case 16336 (Acute care setting)

The faller, a 55 year old stroke survivor, fell on the floor on Monday, April 30, 2012 at 05:20. When the night shift registered nurse (RN) woke the faller up to check for incontinence, the faller expressed the need to go to the washroom. The RN released the restraints, put on the faller’s shoes and assisted her to stand. The RN then realized that the faller was unsteady on her feet and that she needed more assistance to walk the faller to the washroom. The RN assisted the faller to sit back down on the bed, waited a few minutes to be sure that the faller could sit independently without losing balance and instructed her to remain seated. She went to the room entrance to call for assistance from another nurse at the front desk. When the RN turned towards the faller, she saw that the faller had stood up on her own. Because the faller could not stand on her own, she slowly slid down from the edge of the bed to the floor. The second nurse entered the room and the faller was assisted to the bed by two RNs and assessed for injuries. The faller did not sustain any injuries. She was then taken to the washroom.

Restraints had been placed on the faller the evening before settling in for bed because she often forgot where she was and would try to leave. After deciding to take the faller to the washroom, the RN removed the restraints. However, she did not put restraints back on the faller when she decided to step away to call for help from the entrance to the room. The RN also chose not to use the call bell on the faller’s bed because she believed that the call bell was often not answered right away and that it
would have taken a longer time to receive assistance if she used the call bell instead of stepping away to call for help. There was confusion among unit staff as to who was responsible for answering the call bell, and because most patients in the unit were cognitively impaired, the call bell was often used inappropriately. Therefore, the call bell telephone at the main nursing station was frequently left to ring many times before the appropriate nurse was able to attend to the patient. The call bell was sometimes answered by the unit clerks but this was done inconsistently. The unit clerks had not been clearly instructed that it was their responsibility to answer the call bells. If they answered the call bells they then had to inform the appropriate nurse that his/her patient was asking for help. This was either done by use of the overhead intercom or by finding the nurse and informing him/her. The call bells also malfunctioned at times when either the patients could not be heard properly or the patients could not hear the clerks. A new call bell system had been scheduled to be placed in the unit, but at the time of this investigation this change had not yet been implemented, due to a lack of technical support.

Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

- Due to hydrocephalus, large subarachnoid and intraventricular hemorrhages, infections, a lengthy recovery time, multiple medications, and eight surgical procedures, the faller was disoriented, impulsive, and cognitively impaired. She had difficulty with short-term memory and in particular with laying down new memories. The faller often did not follow instructions, and staff had to repeat instructions constantly. Repetition of instructions was the standard practice in the unit for instructing cognitively impaired patients.

- The faller needed assistance with all activities of daily living and always required one to two people assisting her with transfers and ambulation. Because she was impulsive, she attempted to get out of bed on her own as soon as the nurse stepped away from her, prior to the fall.
• The faller had muscle weakness and poor balance. She was unstable on her feet when she first woke and rose from bed.

• The night RN was not familiar with the faller’s fluctuating balance and believed that she would be able to manage the transfer to the washroom by herself since earlier that evening, when the faller was alert and fully awake, the night RN was able to assist her to the washroom together with the faller’s husband.

• The RN did not settle faller back into bed before stepping away to ask for assistance. She took off the restraints but did not put them back on after deciding that she needed to go to the door and ask for help from another nurse.

• Due to a shortage of regular nursing staff on the unit, the faller’s RN during the night of the fall was from the Nursing Resource Unit. Although the night RN had previous experience working with stroke patients, she had only cared for the faller once in the past. The RN did not have much experience with the faller’s ambulation and transfers because the faller was bedridden the last time the RN took care of her three weeks earlier.

• The night RN did not use the call bell to call for help, because she believed that it would have taken longer to receive assistance if she had used the call bell instead of stepping out of the room to call for help. Overall, the call bell was not answered consistently and promptly, and it often malfunctioned. There were no rules or policy to inform staff whose responsibility it was to answer the call bell. Aware of the current issues with the call bell system, the unit purchased a new call bell system a year earlier, but due to a lack of technical support, this new system has not yet been installed. The new system would allow each nurse to carry a hand held device connected to the specific patients for whom they are caring. This allows calls made by patients to be sent directly to their specific nurse, bypassing the centralized system at the main nursing station.
3.4.2 Case 18303 (Stroke rehabilitation setting)

The faller, a 73 year old stroke survivor fell on Saturday, September 15, 2012 at 07:10. Like any other day, the faller woke up around 07:00 and used the call bell to call for assistance to go to the washroom. Because all seven nurses in the unit were partaking in the scheduled shift change and handover of responsibilities meeting, the personal care provider (PCP) attended to the faller. The PCP, who was 6 months pregnant, checked the transfer status posted above the faller’s bed before assisting her to the washroom. The instructions indicated assistance by at least one person. The PCP assisted the faller into her wheelchair then wheeled her into the washroom. The PCP parked the wheelchair perpendicular to the toilet, then she stood behind the wheelchair as the faller stood up independently and grabbed onto the bathroom grab bars. The faller tried to hold onto the grab bars as she pulled up her nightgown and pivoted around to sit on the toilet. She was cognizant of the fact that the PCP was six months pregnant and was concerned for the well-being of the mother and baby. She attempted to maneuver onto the toilet by herself and decided not to ask for further assistance because she was worried that she would hurt the PCP and her baby. The faller’s left knee buckled and she lost her balance. The faller was no longer able to hold onto the grab bars, and when she let go, she fell to her left side, hitting the wall, and then hitting the toilet with her head. She lay on the ground in front of the toilet and wheelchair while the PCP rushed outside the room to call for help. Three nurses ran to the scene and assisted the faller up. They helped her use the washroom and returned her to bed where she was assessed for injuries. Only minor bruising on her left arm and pain in the left shoulder were observed but no head injuries or changes in level of consciousness were reported.

Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

- The faller had significant hemiparesis involving the left arm more than the left leg with limited ability to move either one. Her fingers remained flexed and she had no intrinsic movements in her hands and straightening her fingers caused her
considerable discomfort. She was not dysarthric (difficulty formulating words) and appeared not to have any significant perceptual deficits but was slow to respond. Due to a stroke affecting the basal ganglia, the faller had difficulty with decision-making abilities.

- The faller had significant muscle weakness and was left side hemiplegic. She had morning fatigue and was unsteady on her feet when she first rose from bed. The faller required the assistance of at least one other person for all transfers and ambulation.

- Although the PCP followed transfer instructions written on the transfer status chart posted above the patient’s bed, the chart did not specifically indicate that the faller needed assistance on her left side. Therefore, during the transfer from wheelchair to toilet, the PCP was positioned inappropriately, because she was standing behind the wheelchair and not on the faller’s left side. The transfer instructions were changed by the PT after the fall.

- Although the faller recognized that she needed more assistance on her left side and that the PCP was not in an optimal position to support her, she chose not to say anything because she was concerned about the well-being of the pregnant PCP. She stated that she did not want to unintentionally harm the PCP or her child if she happened to fall and, instead, decided to transfer herself to the toilet independently.

- The PCP had not visited occupational health for modifications to her workload. Although the PCP felt comfortable performing her roles and responsibilities as usual, this information was not provided to the faller, who assumed, based on the physical appearance of the PCP, that she was incapable of performing her duties.

- Because the PCP did not approach occupational health for workload adjustments, the PCP was expected to perform transfers as usual.
• The organizational policy for workload adjustments does not distinguish between accommodation due to pregnancy, and accommodation due to disability or infirmity.

• During the morning shift change, all seven RNs participate in a mandatory shift change meeting whereby patient information from the night shift RNs is passed on to the day shift RNs. This report meeting took place from 07:00 to 07:30. During this time, there was only one PCP and one porter in the unit to assist 20 patients. If a patient requires assistance with transfers or ambulation, then he/she has to wait for either the PCP or porter or for the RN to be done with reports.

3.4.3 Case 17918 (Community setting)

The faller, a 72 year old right handed male fell on the driveway of his house on July 25, 2012 at approximately 14:15. This was the second fall resulting in serious head injury that this person experienced since the beginning of 2012. Both falls led the faller to seek medical attention in the emergency room and admission to the hospital. On the day of the fall, the faller had an uneventful morning consisting of normal activities such as eating breakfast and resting on the couch. In the afternoon, the faller accompanied his wife to her mammogram appointment and later to the butcher shop. When they returned home after their busy afternoon, the faller’s wife was getting grocery bags out of the trunk of the car when she noticed her husband walking down their driveway, towards the mailboxes situated across the street. She warned the faller not to pick up the mail and that she would go herself later, but he did not listen. After some bickering, the faller rushed towards the mailbox, confident that he was capable of performing such a simple task. He took 5-6 steps on the cobblestone driveway using his cane, then switched his cane from his right hand to his left hand so that his right hand was free to reach into his right pant pocket for the mailbox key. As he was performing these tasks, the faller lost his footing and consequently lost his balance. He fell forward and landed on the ground on his left side. The impact of the fall caused the faller’s glasses to break and the metal frame to cut
the skin near his left eyebrow. The sound of the impact and the sight of blood scared the faller’s wife, and she rushed towards him, dropping everything on her way. She shook the faller to make sure he was breathing and yelled for help. A nearby neighbor heard the commotion and rushed outside to assist. She called an ambulance and within a couple of minutes the paramedics arrived at the scene and transported the faller to the emergency room. The faller did not report losing consciousness, but he was hospitalized for 2 days. This fall resulted in a new small right tentorial smear subdural hematoma, and the faller received two sutures for his eyebrow laceration.

Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

- The faller experienced frequent falls, two of which resulted in subdural hematomas and required hospitalizations. He had muscle weakness, osteoarthritis, Type 2 Diabetes, Alzheimer’s disease, seizures, and chronic insomnia accompanied by daytime fatigue. Due to these reasons, the faller’s wife never left the faller unsupervised and had to take him with her when she ran errands or went to her own medical appointments.

- The faller suffered from chronic insomnia and often felt fatigued. On the day of the fall, the faller had been out with his wife all afternoon, accompanying her to her mammogram appointment and also to the butcher shop. He had not slept well the night before and was tired. Several hours had passed since he last ate, and although his exact blood-glucose levels at the time of the fall are not known, his hunger may have added to his fatigue.

- The faller often did not listen to his wife’s instructions and was overconfident in his abilities to complete tasks that he used to do independently. The faller and his wife argued and bickered often, and at the time of the fall, he was in a hurry to prove to his wife that he was still capable of picking up the mail by himself.
The PT at the hospital recommended a rollator walker for outdoor use, but the faller did not use his walker and instead used a cane. For him, the walker was inconvenient and the cane was easier to use. He needed his cane for support at all times. At the time of the fall, he was using his cane but had switched it from his right to left hand so that he could reach into his right pant pocket to get his mailbox key. Therefore, at the time of the fall, he did not have the support of his cane.

The central mailbox unit, where all mailboxes for the 20 townhomes on the street, was located 25 meters away from the faller’s driveway. This posed a problem for both the faller and his wife, because both suffered from arthritis and because the faller was unsteady on his feet. It was a long distance to walk to retrieve their mail.

After his first fall and subsequent long hospitalization period, the faller was discharged home with minimal CCAC support. Because the faller’s neurological capacity had returned back to baseline, he was deemed eligible to go back home in the care of his wife.

CCAC provided the faller with three PT and three OT sessions. A home assessment was done and recommendations regarding bathroom grab bars were made. Dressing and showering services were refused because the faller and his wife felt more comfortable doing these themselves.

The faller and his wife had no children or relatives, and the faller’s wife was the sole caregiver for the faller. She suffered from many chronic health conditions herself, including breast cancer and arthritis. She was stressed and tired with her increasing responsibilities caring for her husband and herself, as well as taking care of the home and finances. She was in need of respite care. However, the faller was only provided with a half-day adult day program by the CCAC, once a week. This was the only time the faller’s wife was away from the faller. She did not think a nursing home was a viable option but acknowledged that she needed help and support in caring for her husband.
• When the faller’s wife requested house cleaning support from the CCAC they refused because they no longer provided these services due to budget cutbacks. They provided the faller’s wife with a list of vendors who offered cleaning services. These services had to be paid for out-of-pocket by the faller and his wife.

• The faller’s wife felt dissatisfied with the level of support she was receiving from the CCAC but was reluctant to share this information because she feared that they would be cut off from all services if she said anything negative.

3.5 Identified contributing factors

A number of contributing factors (CFs) were identified for each fall investigation. In each investigation, factors at every level of the Swiss Cheese Model of Accident Causation were found. Full case reports for each investigation can be found in Appendix K. Included in these comprehensive reports is a Sequence of Events (SOE) diagram which shows a detailed timeline of the events leading up to the fall (impact), including safety significant events and the associated CFs. The Swiss Cheese Model of Accident Causation summary tables are also included in the full reports. A total of 755 CFs were identified from the 22 cases investigated. On average, there were 34 (range of 24-46) CFs in each investigation. Most CFs were found at the Preconditions level, an average of 17 (total: 368, range 10-25); followed by Unsafe Acts, an average of 8 (total: 182, range 5-12); Supervision, an average of 5 (total: 111, range 2-10) and finally Organizational factors, an average of 4 (total: 94, range 1-9). The 22 Swiss cheese tables were used in content analysis for the development of codes and the identification of similarities between cases.

3.6 Results of content analysis

In order to better understand and be able to identify similarities and patterns in the contributing factors that lead to falls in stroke survivors, the 755 CFs produced from the investigations had to be coded and analyzed.
3.6.1 Coding list formation

The creation of the coding list was a four step process. First, four researchers independently produced codes by analyzing six Swiss cheese tables each. Next, a draft list of all codes was created. The researchers then met to consolidate and discuss discrepancies with the draft list of codes. Once a consensus was reached, two researchers coded all 22 Swiss cheese tables using the new agreed-upon coding list. The final coding list includes 37 codes; 12 main codes, 20 sub-codes (sub-code A) and 14 sub-sub-codes (sub-code B) and can be found in Appendix J. All CFs from the 22 Swiss cheese tables were coded into one of the generated codes.

3.6.2 Factors contributing to falls in stroke survivors with 100% prevalence across all settings

Five codes were found in 100% of cases, across all three settings: other unsafe acts or decisions; balance; physical consequences of stroke; muscle weakness as a consequence of stroke; and medications as a consequence of stroke. They are presented in Table 4, along with a description of each code.
Table 4 Factors Contributing to Falls (100% prevalence)

<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code A</th>
<th>Sub-code B</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsafe acts and decisions</td>
<td>Other unsafe acts or decisions</td>
<td>All other unsafe acts or decisions by stroke survivors, caregivers or healthcare team that do not include rushing, multi-tasking, striving for independence or over-reaching. Example: RN goes to the door to call for assistance.</td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td></td>
<td>Any issues related to balance, including poor balance, loss of balance, poor postural control, poor trunk control, poor dynamic balance, and poor coordination. Could be in relation to either the stroke survivor or anyone else involved in the falls incident. Example: Faller loses balance; PCP loses balance; faller has poor coordination.</td>
<td></td>
</tr>
<tr>
<td>Stroke consequences</td>
<td>Physical</td>
<td>All physical conditions related to the stroke: specific stroke diagnosis, hemiplegia, left side neglect, dysphasia, aphasia, dysarthria, etc. Example: Faller is hemiplegic on left side.</td>
<td></td>
</tr>
<tr>
<td>Stroke consequences</td>
<td>Muscle weakness</td>
<td>Includes: leg gives out, elbow gives out, arm gives out, muscle atrophy, not strong enough, fatigue, frailty, and impaired mobility. Example: Faller is not strong enough to support his weight.</td>
<td></td>
</tr>
<tr>
<td>Stroke consequences</td>
<td>Medications</td>
<td>Any issues related to medications, including poly-pharmacy and side-effects. Example: Faller is on 12 prescription medications.</td>
<td></td>
</tr>
</tbody>
</table>
3.6.3 Factors Contributing to Falls in Stroke Survivors with 80-99% Prevalence Across Settings

Two codes were found to be highly prevalent across settings: comorbidities and staff being unaware (sub-sub-code of formal supervision). The code “staff unaware” was not applicable to the home setting but was found to appear 14 out of 16 times (87.5% prevalence rate) in cases across acute care and rehabilitation hospitals.
Table 5 Factors Contributing to Falls (80-99% prevalence)

<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code A</th>
<th>Sub-code B</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comorbidities</td>
<td></td>
<td></td>
<td>Other illnesses and health issues such as MS, neuropathy, PD, BP, osteoporosis, bradycardia, transient loss of consciousness, incontinence, pain, sleep apnea, poor diet, ulcers, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>Example: Faller suffers from degenerative disc disease.</em></td>
</tr>
<tr>
<td>Supervision</td>
<td>Formal</td>
<td>Staff unaware</td>
<td>Issues related to staff being unaware of patients’ activities when left unsupervised or patients’ fluctuating medical condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>Example: RN is unaware of swelling in faller’s left leg.</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>Note: This code is only applicable to acute care and rehab settings.</em></td>
</tr>
</tbody>
</table>
3.6.4 Factors Contributing to Falls in Stroke Survivors with 60-79% Prevalence Across Settings

Nine codes were found to be frequent contributors to falls: striving for independence, ignored warning signs/missed opportunities/failure to learn, assistive devices, impulsiveness, call bells, patient to staff ratios, policies, inadequate falls prevention, and novelty. The codes “call bells” and “patient to staff ratios” applied only to the hospital settings. However, because they appeared more than 60% of the time across those two settings, they were included as frequent contributors to falls. These codes, along with a description, are presented in Table 6.
<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code A</th>
<th>Sub-code B</th>
<th>Description</th>
</tr>
</thead>
</table>
| Unsafe acts and decisions     | Striving for        | Independence                                                                | Any attempt by the stroke survivor to maintain their independence. Includes: independent and unsupervised transfers and waiting for assistance with transfers.  
*Example:* Faller attempts to transfer to his bed on his own. |
| Ignored warning signs/missed  |                      |                                                                             | Includes: standard practice is left unchanged; falls prevention strategies are left unadjusted after a previous fall, or previous attempts at unsafe acts; BPGs are not followed; not learning from previous mishaps; only following procedures (filling out adverse events reports without follow-up); previous falls.  
*Example:* Faller experiences first fall at acute care hospital while trying to go to the washroom by himself. |
| Assistive devices (AD)        |                      |                                                                             | Any issues with ADs including poorly fitting ADs, uncomfortable ADs, delay in receiving ADs, repairing ADs, new ADs, unfamiliarity with ADs and the comfort, efficiency and design of the ADs.  
*Example:* Faller was previously using a generic hospital wheelchair that did not fit him well. |
| Stroke consequences           | Impulsiveness        |                                                                             | All conditions related to the stroke survivor acting impulsively, including, agitation, anxiety, restlessness, over-estimating one’s ability, over-confidence in one’s ability, aggression.  
*Example:* Faller over-estimated his ability to transfer independently due to better-fitting wheelchair. |
<table>
<thead>
<tr>
<th>Category</th>
<th>Type</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Call bells*</td>
<td>Any issues related to the call bells, including inefficiency of the call bell system, patients waiting for the call bell to be answered, the responsibility of answering the call bell. <em>Example: Usual nursing practice is to call for help from the door rather than to use the call bell because the centralized call bell system is inefficient.</em></td>
<td></td>
</tr>
<tr>
<td>Supervision</td>
<td>Formal</td>
<td>Patient to staff ratio*</td>
<td>Any issues related to staff to patient ratios, including drop in staffing levels during lunch breaks, at night, and during the 30 minutes verbal reporting period at shift change. <em>Example: RN to patient ratio during the night is 1:7.</em></td>
</tr>
<tr>
<td>Supervision</td>
<td>Formal</td>
<td>Policies</td>
<td>Any topic related to hospital policies or BPGs in relation to supervision. Includes lack of policies to increase supervision. <em>Example: Due to aphasia and GJ tube inserted earlier in the day, the faller requires frequent supervision.</em></td>
</tr>
<tr>
<td>Inadequate falls prevention</td>
<td></td>
<td></td>
<td>Any topics related to falls prevention strategies and programs. Includes: falls assessments, reactive falls prevention strategies where something is done only after the fall. <em>Example: Faller is assessed as high risk for falls but individualized falls prevention strategy is not put in place.</em></td>
</tr>
<tr>
<td>Novelty</td>
<td></td>
<td></td>
<td>Includes all issues related to something new and unexpected happening close to the event. <em>Example: The custom-fitted wheelchair is new, faller received it yesterday; this is the first time the RN is caring for this patient.</em></td>
</tr>
</tbody>
</table>

*Notes: * Indicates code was only applicable to hospital settings, and not applicable to home setting.
3.6.5 Factors Contributing to Falls in Stroke Survivors Unique to a Particular Setting

These unique codes included: stroke consequences-cognition (appeared 6/6 cases in acute care setting); transitions of care-environmental changes post-discharge (appeared 6/6 cases in home setting); transitions of care-community services (appeared 6/6 cases in home setting); transitions of care-challenges for informal caregivers (appeared 5/6 cases in home setting). These codes, along with a description of each code, are presented in Table 7.
<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-code A</th>
<th>Sub-code B</th>
<th>Description</th>
<th>Setting (prevalence)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stroke</td>
<td>Cognition</td>
<td>All conditions related to cognition including, poor short term memory, disorientation, confusion, lack of insight into one’s disability, drowsiness, and applying instructions to new situations. Example: Faller has difficulty with memory.</td>
<td>Acute care (6/6)</td>
</tr>
<tr>
<td>Transitions of Care</td>
<td>Changes</td>
<td>Environmental challenges post-discharge</td>
<td>Any issues related to the home environment of the stroke survivor post-discharge from hospital. Includes: inadequate assessment of home environment by CCAC or CSRT; no changes made to home environment upon return home from hospital; stroke survivor has to learn to adapt to hazardous environments. Example: OT safety assessment does not include assessment of furniture.</td>
<td>Home (6/6)</td>
</tr>
<tr>
<td></td>
<td>post-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>discharge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transitions of Care</td>
<td>Changes post-discharge</td>
<td>Challenges for informal caregivers</td>
<td>Home (6/6)</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------</td>
<td>-----------------------------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topics related to informal caregivers (ICG) post-discharge from hospital. Includes: ICG not given enough training, support, or resources to deal with new challenges of caring for a recovering stroke patient; ICG is unable to supervise adequately due to his/her own health issues; ICGs are burnt out with the level of care they are expected to provide; or ICGs are untrained, unprepared, overwhelmed, or uninvolved and isolated (they are sole care providers for stroke survivor).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Example: Epilepsy unit did not provide fiancé with any support or training to help her cope with faller’s frequent dizzy spells and falls.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 4

4 Discussion

Falls in stroke survivors travelling through the continuum of care are complex events with multiple contributing factors. In this study, 22 falls case investigations from three settings across the continuum of care were analyzed. Over 750 contributing factors to falls were identified, each representing a “hole” in one of four levels of the Swiss cheese: Unsafe acts; Preconditions; Supervision; and Organization. Only when holes at all four levels of the Swiss cheese align, does an accident or a systems failure occur. Factors contributing to falls are both sharp-end factors, such as over-reaching for something on the floor, and blunt-end/latent factors, such as the lack of a home safety assessment to check for hazardous placement of furniture. Both sharp-end and blunt-end factors are present in every accident, such as a fall. Cross-case analysis of these contributing factors from each case was completed to better understand similarities across all settings, as well as to identify factors that were unique to a particular setting.

4.1 Contributing factors by prevalence

4.1.1 Factors contributing to falls with 100% prevalence

Five factors contributing to falls in 100% of the cases and settings were identified: unsafe acts and decisions; balance; physical consequences of stroke; muscle weakness as a consequence of stroke; and medications as a consequence of stroke. These five factors mostly represent factors related to the unsafe acts or decisions or the factors directly related to the stroke survivor (preconditions). A stroke profoundly affects a person’s physical abilities, often leading to impairments and severe consequences. Physical consequences of a stroke such as hemiplegia, left-sided neglect, dysphasia, aphasia, and dysarthria often influence falls because they impact how a stroke survivor moves and communicates with his/her environment. Therefore, it is no surprise that stroke specific consequences, especially those relating to balance, were prevalent in all 22 cases.
4.1.2 Factors contributing to falls with 80-99% prevalence

Two other factors were identified as contributing to falls in 80-99% of cases across all settings (or all the settings to which they were applicable): comorbidities; and staff being unaware in the formal supervision category. Comorbidities contribute to falls by interacting with situational factors. For example, most fallers suffered from urinary incontinence after their stroke, and this combined with a lack of mobility or being restrained led to the faller attempting to get out of bed/wheelchair to use the washroom, which when combined with other factors, such as lack of supervision, led to falls. Another example of the interaction of comorbidities and situational factors was the experience of pain. In two cases, fallers experienced back pain, which led to shifting and adjusting positions on either a wheelchair or bed to feel more comfortable. Combined with other factors such as lack of communication due to language barriers, this contributed to falls. Another factor that contributed to falls was staff being unaware, under the broader code of formal supervision. This factor was highly prevalent in both acute care and inpatient rehabilitation settings but was not applicable to the home setting. This factor included issues related to staff being unaware of patients’ activities when they were left unsupervised or staff being unaware of a patient’s fluctuating medical condition. During acute care and particularly during inpatient rehabilitation, stroke survivors begin to regain some of their mobility as they recover and rehabilitate from their stroke. It is at this time that stroke survivors begin to attempt independent transfers, gain confidence in their abilities due to better performance during therapy sessions, and begin to want more autonomy. However, members of the healthcare team are not able to monitor each patient 24 hours a day. It is at these unsupervised times that most patients attempt independent transfers. Staff being unaware of stroke survivor’s activities while they are left unsupervised plays a major role in falls. Better monitoring of patients or more supervision is needed at all times post-stroke, especially during the early phases of rehabilitation therapy.

4.1.3 Factors contributing to falls with 60-79% prevalence

Finally, nine codes were identified as contributing to falls in 60-79% of cases across all settings. These codes included: striving for independence; ignored warning
signs/missed opportunities/failure to learn; assistive devices; impulsiveness; call bells; patient to staff ratios; policies, inadequate falls prevention; and novelty. When the characteristics of falls investigated were reviewed in Chapter 3, it was evident that falls most often occurred when a stroke survivor was striving for independence. This factor is closely linked to the previous factor, staff unaware. When stroke survivors are on the road to recovery, they make every attempt to regain their independence. This is most apparent in cases of independent, unsupervised transfers. Closely linked to striving for independence is impulsivity. During recovery, stroke survivors are often agitated, restless, or anxious. They over-estimate their abilities, not yet accustomed to their impairments. Impulsivity combined with other factors, such as striving for independence, often leads to falls. Another factor found to be a frequent contributor to falls was assistive devices (ADs). Many times, it was found that ADs did not fit well, were uncomfortable, or were in need of repair or there was unfamiliarity with the AD. For example, poor-fitting wheelchairs, which came from a hospital pool of generic wheelchairs, were often given to the stroke survivor. If it was found that there was a problem with these wheelchairs, usually after a fall occurred, the faller was then prescribed a custom-fitted wheelchair. This reactive approach to falls prevention and addressing latent factors in the system was observed in the falls prevention strategies in place at each hospital setting. This code (inadequate falls prevention) was a frequent contributor to falls, because it was found that some fall prevention strategies were implemented only after a patient experienced at least one fall. Many times, falls assessments were completed but no individualized strategies were put into place. Also, falls assessments were inconsistently completed in both hospital settings. In the home setting, falls prevention strategies were non-existent. That is, it appears as though falls prevention was not given high priority in any of the three settings, and in the home setting in particular, falls prevention did not receive any attention by community service providers. Once a patient is discharged home from the hospital, the responsibility of falls prevention is placed on the patient and the patient’s family. It is wrong to assume that stroke survivors and their families will have the necessary resources to prevent falls in their homes once they return from hospital.

Similar to the factor of inadequate falls prevention is the factor of ignored warning signs/missed opportunities/failure to learn. Again, a passive approach was
evident across all settings. Within the hospital settings, falls prevention strategies were left unchanged after a previous fall or previous attempts at unsafe acts, Best Practice Guidelines (BPGs) were not followed, or standard practice was left unchanged even after a previous mishap. For example, within the hospital settings, all adverse events are required to be documented using an online reporting system. Once these adverse event reports were filled out and reviewed by management, it did not appear that further steps were taken to implement change. The issue of ignored warning signs also appeared across all community cases. It appears that stroke survivors in the community rely heavily on others to care for them. That is, in terms of safety, stroke survivors did not seem concerned that it was their responsibility to care for their own safety and prevent falls. They relied very heavily on community services and appeared to believe that it was the responsibility of community service providers to address the issues of safety. However, community outreach services such as CCAC and CSRT were not fully addressing safety issues such as clutter in the home or arrangement of furniture to allow for easy maneuvering of walkers and other assistive devices. There seems to be a gap between what stroke survivors expect and what community service providers offer. Ignored warning signs were a frequent contributor to falls, and yet it was one of the factors that could easily and promptly be addressed across all levels of care.

Another frequent contributor to falls was the lack of formal policies on supervision or the ineffective use of pre-existing supervision policies. Often it was found that hospital policies or BPGs in relation to supervision were either lacking or not adequately being followed. For example, stroke survivors who experienced other medical consequences due to their stroke, such as aphasia, were left unattended and unsupervised. Due to their aphasia, these patients were unable to communicate their needs and ask for assistance, they were frustrated waiting for assistance, and often they attempted to transfer independently. There was a lack of policies to address the specific needs of increased supervision for stroke survivors experiencing additional impairments, whereby their modes of communication were impaired.

Two factors were found to be prevalent in the hospital settings, but were not applicable to the home setting. However, because they were frequent contributors to falls in the hospital settings, they are included here. The first was the issue of patient to staff
ratios, under the broader code of formal supervision. It was found that a drop in staff at specific times in the day, such as lunch time, night shift, or during a 30-minute verbal reporting period before shift change, was a frequent contributor to falls. It was during these times that patients received less supervision and less attention. Patients often became restless waiting and attempted to independently take care of their needs (for example, to use the washroom). A second factor found to contribute to falls in the hospital settings was the call bell system. The call bell technology allows patients to call for assistance from their rooms (call bells are also found in the patient washrooms). These calls are then answered by nurses or unit clerks from a central call bell telephone at the main desk of the unit (in both acute care and rehabilitation hospitals), and the appropriate nurse is notified to assist the patient. It was found that, in the acute care setting, it was not explicitly clear who was responsible for answering the call bell telephone, and often these calls would go unanswered. Staff received a constant bombardment of calls from the call bell system and had adapted by often ignoring the rings. When asked why these calls were left unanswered, several staff pointed out that, most times, patients who are cognitively impaired call when they do not actually require any assistance. Staff also discussed the lack of regulation in terms of who was responsible for answering the call bells. Call bells were difficult for unit clerks, because once they answered a call, they had to look for the appropriate nurse to assist the patient who was calling. This required additional work by the clerks and meant that they had to stop what they were doing to locate the patient’s nurse. A more efficient calling system is needed. A direct walky-talky call bell system had been purchased approximately a year before the commencement of this study, however at the time of the investigations, this system had yet to be installed and utilized. In the rehabilitation hospital setting, the call bell system had specific rules and regulations. The unit clerk was responsible for answering the call bells and notifying the nurses. This was found to be effective in the rehabilitation hospital. However, patients often used the call bells inappropriately or not at all, making them less than a perfect communication tool.

Finally, novelty was found to be a frequent contributor to falls across all settings. Often a fall occurred in relation to something new or unusual. For example, falls often occurred when a nurse was new to taking care of a particular patient, when she/he had no
previous experience with the patient. Falls also tended to occur when a patient received a new assistive device, such as a new wheelchair, with which they did not have any previous experience. It is important to acknowledge and be cognizant of novelty when dealing with falls prevention in the stroke population. Stroke patients often suffer from cognitive impairments and have a difficult time navigating their environments. The added stress of introducing something new and unusual can combine with other factors to lead to a fall.

4.1.4 Factors contributing to falls unique to a particular setting

In addition to looking at similarities across settings, it is also important to draw attention to unique contributing factors that occur only in specific settings across the continuum of care. These factors included: cognition as a consequence of stroke, which was present in all cases in the acute care setting but less prevalent in other settings; transitions of care-environmental changes post-discharge, which appeared in all community cases but not at all in hospital cases; transitions of care-community services, present in all community cases but not applicable to hospital cases; and transitions of care-challenges for informal caregivers, which appeared in five out of six community cases.

During the acute phase of stroke, patients are highly medicated and confused. Issues related to cognition, such as disorientation, drowsiness, inability to apply instructions to new situations, poor short-term memory, and a lack of insight into their disability, all play a role in this phase of stroke recovery. These issues, when combined with other factors, such as lack of supervision, can be detrimental to safety and often lead to an accident, such as a fall.

Factors related to transitions of care, specifically, issues related to the care and safety of patients once they were discharged from hospital were highly prevalent in the community setting. The issue of environmental challenges post-discharge played a major role in falls in all home cases. Post-discharge, stroke survivors return to their home setting where they once lived before the stroke. These home environments were often not adjusted for the new impairments of the stroke survivor. Recommendations were usually
made by hospital staff before a patient was discharged. However, these recommendations were often minor. It was found that community service providers did not provide home safety assessments, or if a home safety assessment was completed, it was completed inconsistently and without a standardized tool. Home safety assessments never included furniture or the arrangement of furniture and the hazards associated with navigating through the home setting. In fact, it was evident that stroke survivors had to learn to adapt to the hazardous environments to which they returned and that the new functional abilities of these patients were not taken into consideration in relation to the home environment. Again, there was a gap in responsibility and care, whereby stroke survivors did not have the resources or were unaware that the home environment posed a safety hazard. Also community service providers did not provide adequate resources and recommendations for home safety, allowing home hazards to combine with the right circumstances to lead to falls in the home setting.

A similar factor, transitions of care-community services, was also found to be a unique factor contributing to falls in the home setting. Stroke survivors’ families felt that community outreach services, namely CCAC and CSRT, did not provide enough support once the stroke survivor returned home. Families felt the follow-ups were inadequate to meet their needs. For example, if recommendations were made (such as to install a grab bar in the shower or to hire additional support for the care of children in the home), it was often left up to the family to implement these recommendations. Apparently because of system constraints in service provision, community service providers were often unable to follow-up with patients or their families after recommendations were made. Similarly, it was found that, due to budget cutbacks, community outreach programs were not able to provide stroke survivors and their families with additional resources, such as assistance with childcare for a family with small children and a parent who is now a stroke survivor dealing with new disabilities, or housecleaning services to an elderly spouse who had to deal with the responsibility of caring for her husband while also dealing with her own health issues. Families of stroke survivors, dealing with these new challenges would benefit from additional resources and guidance on safety from community service providers.
Challenges for informal caregivers were also a unique factor contributing to falls within the community. As discussed above, stroke survivor’s family members felt burnt out and believed they were not given enough resources or support when dealing with the care of a stroke survivor. Informal caregivers reported feeling overwhelmed, unprepared, and untrained to deal with the new challenges they faced in caring for their loved ones. They reported feeling isolated and inundated by the amount of additional work involved with caring for a stroke survivor, which not only affected the quality of life of the caregiver, but also that of the stroke survivor. Again, informal caregivers of stroke survivors were not adequately trained and were not given the appropriate resources to deal with safety in the home.

4.2 More than just risk factors

Knowing when, where, and under what circumstances stroke survivors fall can assist with developing appropriate falls prevention strategies. Circumstances leading to a fall in stroke survivors have distinct patterns, not only in different settings but also across the continuum of care. The multitude of factors leading to a fall in the stroke population is often different and unique to falls that occur in the general elderly population. The results of this study indicate across setting similarities to falls in stroke survivors with varying levels of prevalence and also unique factors that are prevalent in only certain settings across the continuum of care. Studies in the past have mainly focused on identifying risk factors for falls in stroke patients. However, risk factor analysis does not provide a comprehensive picture of all contributing factors that lead to a fall.

Falls have most extensively been looked at during the rehabilitation and community phases, with less attention given to falls in the acute care phase. The few previous studies that have looked at falls in the acute care stage have noted that stroke severity, a history of anxiety, and a loss of functional status were associated with falls. In the rehabilitation phase, Teasell et al. (2002) found that fallers were more likely to be apraxic and have cognitive deficits. Czernuszenko and Czlonkowska (2009) found that most falls in the rehabilitation phase occurred when patients were attempting unsafe activities, such as a transfer or position change. They also found that inadequate staff assistance was a risk factor for falls. The authors also reported that the risk of falls increased as patients
regained their mobility and confidence during inpatient rehabilitation (Czernuszenko & Czlonkowska, 2009). In an integrative review, Campbell and Matthews (2010) found that survivors affected by stroke-specific deficits, such as impaired balance, visuospatial hemineglect, and impaired performance on ADLs, were at highest risk for falls during stroke rehabilitation. Finally, while in the community, factors associated with falls included depressive symptoms, disability, a history of falls, and older age (Kerse et al., 2008). Batchelor et al. (2012) suggest that fall prevention strategies for stroke survivors at home should focus on the home environment and how the stroke survivor needs to adjust to function within the home environment.

In this study, 22 falls investigations led to the identification of multiple contributing factors. Similarities across settings were found and grouped together in three categories varying by the level of prevalence. Contributors to falls that were found across all cases, across all settings included unsafe acts and decisions, balance, physical consequences to stroke, muscle weakness as a consequence of stroke and medications as a consequence of stroke. Similar to previous studies examining risk factors, it was found that stroke specific deficits, in particular, deficits related to balance, and muscle weakness play a major role in falls. Other highly prevalent contributors to falls included comorbidities, staff being unaware of patient’s activities when they were left unsupervised, patients striving for independence, ignored warning signs, assistive devices, impulsiveness, call bells, patient to staff ratios, policies, inadequate falls prevention, and novelty. Studies in the past have mainly focused on person-centered factors leading to falls, with less attention given to organizational and supervision factors. In this study, patterns of falls across settings identified contributing factors at all levels of safety, including organizational and supervision.

Finally, in addition to the identification of similar factors across settings, this study also identified contributing factors to falls that were unique to a particular setting. These factors included cognition as a consequence of stroke at the acute care setting, and factors related to transitions of care (environmental changes, community services, and challenges for informal caregivers post-discharge) at the community setting. These unique factors
indicate that specific factors in each phase of stroke recovery also need to be addressed in order to improve the safety of stroke patients as they recover.

Falls prevention strategies in the past have generally focused on person-centered factors and have highlighted exercise interventions (Weerdesteyn et al., 2008). Few studies have addressed issues of supervision or organizational factors, such as policies, patient to staff ratios, or ineffective communication devices such as call bells. Combined with person-centered factors, such as impairments in balance, muscle weakness, and medications, these system-wide contributors to falls combine and accumulate to result in a fall. The identification of all contributing factors in falls can assist in specific, targeted prevention strategies for the stroke population. This study uniquely contributes to the current body of knowledge of falls in stroke survivors by providing a series of detailed case study examples that identify both the person-centered and greater system-wide contributors to falls. With the use of a systemic investigation method designed to uncover contributing factors in falls, and the use of multiple case study methodology, this study offers an in-depth look at the how and why of falls in stroke survivors across the continuum of care.

4.3 Review of study purpose and objectives

The overall purpose of this study was to identify the factors that contribute to falls in stroke survivors as they transitioned through the stages in the continuum of care, from acute care to rehabilitation to community re-integration or long-term care. Specifically of interest for this research study were the factors that contribute to falls in the various settings, leading to the following research questions:
1. Are there factors contributing to falls that are similar across all settings?
2. Are there factors contributing to falls that are unique to a particular setting?

Four specific objectives were set for this study. The first objective was to conduct a prospective case series study using the SFIM to identify safety deficiencies at the four levels of the Swiss Cheese Model of Accident Causation. This objective was achieved by conducting 22 falls investigations that identified 755 contributing factors: 182 factors at
the Unsafe Acts level; 368 factors at the Preconditions level; 111 factors at the Supervision level; and 94 factors at the Organization level.

The second study objective was to provide evidence on how the system-wide latent factors combine with the actions of people at the sharp end to cause falls in stroke survivors in all three settings. Investigations from all settings uncovered both sharp-end and blunt-end factors contributing to falls. These factors represented “holes” in the Swiss cheese that, when closed, can improve safety and prevent falls in stroke survivors. Through the sequence of events that were created from each falls occurrence, along with the chronological linking of contributing factors, this second study objective was met.

The third objective was to analyze falls reports to identify patterns or similarities of contributing factors specific to stroke survivors, and to identify unique, setting-specific contributors to falls. Through content analysis, patterns with different prevalence rates were observed across the continuum of care.

The final objective of the study was to discuss implications of the identified safety deficiencies and propose recommendations for systemic changes. Each case study contains a “Conclusions” section. In this section, recommendations for the improvement of safety are made. The implementation of these recommendations is beyond the scope of this study. However, all case reports will be delivered to the quality and safety departments and/or management teams in the appropriate organizations.

### 4.4 Implications for improving patient safety

Numerous implications for clinical practice arose from this study. First, the specific organizations that participated in this study can use the case study reports to address the specific safety deficiencies identified in their organizations. Second, although the results of this study cannot be generalized to the greater stroke population, case studies can be used as examples for other organizations to identify similar factors in their settings.
Specifically, factors that were prevalent across settings should be closely monitored and assessed right away upon admission of a stroke patient to a stroke unit or upon returning home. For example, healthcare personnel should be cognizant of the fact that stroke related deficits such as muscle weakness, impairments with balance, medications and other physical deficits of stroke play a large role in falls in the stroke population. Community outreach services should better inform stroke survivors returning home and their family members of the many risks and hazards present in the home setting. Standardized safety assessment tools that are consistently completed would allow for better identification of these safety hazards.

Specific organizations should also be made aware of the unique setting-specific factors to falls that can affect their patients. In addition, through the use of the SFIM data collection tool, it was demonstrated that a systems approach is needed to increase the focus of falls prevention from just the individual to multilayered individual, organizational and supervisory factors. The SFIM is an effective tool to identify factors leading to falls, and inform prevention and management programs of the specific direction of their efforts. The creation of falls prevention teams at each setting (including CCAC and CSRT), composed of practitioners trained to use the SFIM tool might allow for specific identification of factors within each organization, leading to more focused action on the latent factors to falls.

This study confirms the need for prevention programs that will address not only person-centered factors, such as those related to stroke, but also supervision and organizational factors related to the larger systems. There is very little evidence on successful approaches to reducing falls in the stroke population (Batchelor et al., 2010). This may in part be due to the fact that, in the past, studies have focused on the identification of risk factors and not the specific contributing factors that lead to falls.

4.5 Limitations

Several limitations to this study were identified. First, due to unforeseen circumstances, long-term care facilities to which recruited patients were admitted after
discharge from hospital did not want to participate in this study. Therefore, all falls investigated in the community setting occurred in the home environment. A multitude of different factors potentially exist in a LTC setting but they were not able to be identified in this study.

Second, there is the possibility of selection bias when using case study methodology and hindsight bias when using the SFIM tool, which relies on participants’ ability to recall events. Selection bias refers to the likelihood of using portions of the data that support preconceived ideas and hypotheses. Through the utilization of the SFIM research group, all efforts were made to minimize the effects of selection bias by having multiple viewpoints during within-case analysis. Also, because a minimum of two investigators investigated each fall occurrence, multiple viewpoints also existed during the data collection phase of the study. Triangulation was used to counteract hindsight bias. Also, because most stroke patients enrolled into this study suffered from some form of cognitive impairment, the use of triangulation to confirm all collected data was necessary. Additionally, all investigations were closely monitored and supervised by the creator of the SFIM tool. All case studies were checked for depth and breadth of detail by the creator of the SFIM and all reports were reviewed and revised by at least two other researchers.

The final limitation to the study relates to the SFIM tool. Although this tool was effective at identifying system-wide contributing factors to falls, it required a substantial amount of time and resources to complete each investigation. Each investigation required over 30 hours to complete. The most time consuming portion of the investigations was interviewing healthcare staff, who had very limited time to talk to interviewers. Often healthcare staff were off duty, and researchers had to wait for the next available opportunity to interview them. This increased the chances of hindsight bias and made the task of triangulation more difficult. If investigative teams are made up of healthcare workers within the organizations (“insiders”), the process of investigating falls within that particular setting becomes much less challenging. These “insiders” would have better knowledge of the inner workings of an organization. Also, because these “insiders” are familiar with staff, they would not be seen as a threat and members of the healthcare team
would be more willing to discuss the incident without fear of repercussions. Because members of the research team were viewed as “outsiders” by healthcare staff, staff members felt reluctant and scared to share their personal opinions. They feared that they would be held responsible for the incident.

### 4.6 Future Directions

There is a significant research gap in the literature on falls prevention in stroke survivors. This, in part, is due to the fact that research in the past has focused mainly on reporting incidence and risk factors of falls in stroke survivors and less on specific contributing factors. There is a need for longitudinal studies examining the patterns of falls in stroke survivors across all settings. Specifically, an examination of falls in the LTC setting is needed. In addition, as stated before, the implementation of suggested mechanisms to improve safety is beyond the scope of this study. However, it would be interesting to observe if the implementation of these safety defenses has an impact on falls rates in stroke survivors within the three settings. As discussed earlier, the SFIM is a comprehensive and effective tool in identifying safety deficiencies at all levels of the Swiss cheese. However, due to some of its limitations (such as amount of time required to conduct investigations), further research should examine if other, more efficient tools exist for the identification of contributing factors for falls in stroke survivors.
Chapter 5

5 Conclusions

In Canada, there are approximately 50,000 new stroke cases each year, and in 2009 there were 315,000 stroke survivors living with the long-term effects of stroke (Goeree et al., 2005). In all stages of recovery after stroke, falls are a major potential adverse event (Batchelor et al., 2012), with advanced age further compounding the risk. The incidence of stroke survivors experiencing a fall at all levels of the continuum of care is higher than for other patient populations.

Using a systems approach to look at not only intrinsic and extrinsic factors related to the faller, but also everyone and everything surrounding the incident that are considered potential safety barriers, allows for clear identification of the contributing factors to falls in stroke survivors. Identification of reasons stroke survivors fall enables for targeted intervention and prevention strategies, allowing for an increase in safety within the healthcare system and in the community.

Comprehensive investigations, using the SFIM data collection tool allowed for the identification of the multiple contributing factors involved in a falls incident. The investigation of 22 fall case studies across the stroke continuum of care uncovered over 750 contributing factors (an average of 34 CFs per case). Across-case analysis revealed similarities in contributing factors across all settings (with differing prevalence rates) and also contributors to falls unique to a particular setting.

Factors that were prevalent across all settings included disease-specific factors such as problems with balance, muscle weakness, medications, impulsivity, and poor judgements (in making unsafe decisions and carrying out unsafe acts). Other factors included issues with assistive devices and communication devices (such as call bells), lack of supervision, ineffective falls prevention strategies, and a reactive approach to falls safety. There was a failure to learn from past breakdowns in safety, and falls assessments and prevention strategies were inconsistently carried out. Findings also exposed contributing factors to falls unique to a particular setting, such as cognition in the acute phase of stroke, when patients were highly medicated, agitated, and confused. Specific
factors related to the transition of care post-discharge from hospital were found to contribute to falls in the stroke population living at home. Specifically, it was found that stroke survivors were being sent home with minimal community services, little support for their informal caregivers, and without the proper assessments of their home environments. Post-discharge, stroke survivors and their families were expected to take on the responsibility of safety with minimal support.

The implementation of safety recommendations (made in each case study report) has the potential to improve safety in each of the specific organizations. Identification of similar factors within other organizations involved with the care of stroke survivors has the potential to prevent falls and target fall prevention strategies. Future studies should aim at identifying contributing factors to falls in the stroke population residing in long-term care facilities.
References


Appendices

Appendix A: UWO Research Ethics Board Approval

Use of Human Participants - Ethics Approval Notice

Principal Investigator: Dr. Aleksandra Zecevic
Review Number: 18539E
Review Level: Delegated
Approved Local Adult Participants: 30
Approved Local Minor Participants: 0
Protocol Title: Improving safety and preventing falls in stroke survivors through the continuum of care
Department & Institution: Faculty of Health Sciences, University of Western Ontario
Sponsor: Ontario Stroke Strategy

Ethics Approval Date: November 04, 2011  Expiry Date: October 31, 2016
Documents Reviewed & Approved & Documents Received for Information:

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*It is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans and the Tri-Council Good Clinical Practice Practices; Consolidated Guidelines; and UWO applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of the RED also complies with all membership requirements for REBs as defined in Division 5 of the Food & Drug Regulations.

The ethics approval for UWO studies shall remain valid until the expiry date noted above assuming timely and acceptable responses to UWO HSREB’s periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to UWO’s expiry time you must request it using the UWO Updated Approval Request Form.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

The Chair of the HSREB is Dr. Joseph Gilbert. UWO HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB00009490.

This is an official document: Please retain the original copy filed.
Appendix B: Lawson Approval

LAWSON HEALTH RESEARCH INSTITUTE

FINAL APPROVAL NOTICE

RESEARCH OFFICE REVIEW NO.: R-11-598
PROJECT TITLE: Improving safety and preventing falls in stroke survivors through the continuum of care.

PRINCIPAL INVESTIGATOR: Dr. Aleksandra Zecevic

DATE OF REVIEW BY CRIC: January 23, 2012

Health Sciences REB#: 18538E

Please be advised that the above project was reviewed by the Clinical Research Impact Committee and the project:

Was Approved

PLEASE INFORM THE APPROPRIATE NURSING UNITS, LABORATORIES, ETC. BEFORE STARTING THIS PROTOCOL. THE RESEARCH OFFICE NUMBER MUST BE USED WHEN COMMUNICATING WITH THESE AREAS.

Dr. David Hill
V.P. Research
Lawson Health Research Institute

All future correspondence concerning this study should include the Research Office Review Number and should be directed to Sherry Paiva, CRIC Liaison, LHSC, Rm. C210, Nurses Residence, South Street Hospital.

cc: Administration
Appendix C: Clinical Research Impact Committee (CRIC) Approval

November 28, 2011

Dr. A. Zecevic

Dear Aleksandra:

Re: Improving safety and preventing falls in stroke survivors through the continuum of care - REB# 18538

We wish to acknowledge receipt and thank you for your responses to the Parkwood CRIC review queries. We are, therefore, pleased to provide you with this Parkwood Hospital Clinical Research Impact Committee Letter of Approval.

This approval has been forwarded to the Lawson Health Research Institute Administrative Office, who will issue the final approval as projects may not be started until this final approval is received.

Yours sincerely,

Dalton Wolfe, PhD
Chair, Parkwood Hospital Clinical Research Impact Committee

cc ARGC Administration Office
Lawson Administration Office
Appendix D: Letter of Information-Stroke Survivor

**Improving safety and preventing falls in stroke survivors through the continuum of care**

**Principal Investigator:**
Aleksandra Zecevic, PhD
Faculty of Health Sciences,
University of Western Ontario

**Co-Investigator:**
Mona Madady, MSc candidate
Health and Rehabilitation Sciences Graduate Program
University of Western Ontario

LETTER OF INFORMATION – Stroke survivor/Faller

The pronouns ‘you’ and ‘your’ refer to the research participant and not the person reading this letter.

This letter contains information to help you decide whether or not to participate in this research project. It is important for you to know why the data is being collected and the research is being conducted, and what we are asking you to agree to. Please take the time to read this carefully and feel free to ask questions if anything is unclear.

Researchers from the University of Western Ontario and community partners from University Hospital, Parkwood hospital, Dearness home, and the Ontario Stroke Strategy are engaged in ongoing research to better understand how to prevent falls in stroke survivors. **IF during the next six months** of your post-stroke recovery you experience one or multiple falls or near falls, we would like to talk to you in detail about what happened.

Whether the fall occurs in an acute care hospital, in a rehabilitation hospital, at home or somewhere else, an investigator trained in the Systemic Falls Investigative Method will be assigned to investigate this event. The investigator will interview you and others involved to collect detailed information about things that contributed to your fall. Interviews might be audio taped and the location of the fall might be photographed. We are asking for your permission to collect and use the information from your interview and health record for research purposes. This investigation is done to better understand causes of falling and to improve the safety of all stroke survivors. The procedure is similar to the usual follow-up after a fall in a hospital with the exception that the information being collected will be de-identified (your name or identity will not be revealed) and entered into a Systemic Falls Investigative Method Database (from herein called Falls Database).
If you agree to participate, data relating to your health history and current care will be reviewed, summarized and included in the Falls Occurrence Report which is created by the Falls Database. Once you have been discharged home, we will telephone you every week to find out if your medical status has changed, and if you have experienced another fall. If you did have a fall or near fall, we will investigate it the same way as before. All identifying information such as your name or address will be removed and the information in the Falls Database will be identified only by a unique code number. The Principal Investigator will keep the master list of codes in the Falls Database in a secure location at the University of Western Ontario. The Falls Database is managed by EmPower Health Research Inc. and is stored on a secured web server. The data in the Database will be retained indefinitely to allow us to look at trends over time. The data might potentially be shared with other researchers but it will not include any personal identifiers. The consent to participate in the study will be retained at the University of Western Ontario.

Participation in this study is voluntary. You may refuse to participate, or refuse to allow data to go to the Falls Database at any time with no effect on your future care. If you wish to stop your participation just let the investigator know.

Regardless of your decision to participate your continuing care will not be influenced. You do not waive any legal rights by signing the consent form.

If the results of the research are published or presented at scientific meetings, your name will not be used and no information that discloses your identity will be released or published without your explicit consent.

You will not be compensated for your participation in this Database.

There are no known risks to your participation in this study. All records and the Falls Database are secured and access is limited to authorized personnel only.

You will not benefit directly from participation in this research however the results of our study may help other stroke survivors in the future who experience falls similar to yours.

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research. If you have any questions about the research or the database you may contact Dr. Aleksandra Zecevic. ... If you have any questions about your rights as a research participant or the conduct of the study you may contact Dr. David Hill, Director, Office of Research Ethics at the University of Western Ontario at ....

This letter is for you to keep. You will also be given a copy of the consent form if you agree to sign it.

Thank you very much.
Appendix E: Consent Form-Stroke Survivor

Improving safety and preventing falls in stroke survivors through the continuum of care

Principal Investigator:
Aleksandra Zecevic, PhD
Faculty of Health Sciences,
University of Western Ontario

CONSENT FORM

I have read the Letter of Information and have had the nature of the Systemic Falls Investigation Method Database explained to me, I agree to participate. All questions have been answered to my satisfaction.

---------------------------------------------
Name of participant (Print)

---------------------------------------------
Signature of participant Date

Name of legally authorized representative (Print)
(If appropriate)

---------------------------------------------
Signature of legally authorized representative (If appropriate) Date

Name of person obtaining consent (Print)

---------------------------------------------
Signature of person obtaining consent Date
Appendix F: Letter of Information-Generic

Improving safety and preventing falls in stroke survivors through the continuum of care

**Principal Investigator:**
Aleksandra Zecevic, PhD  
Faculty of Health Sciences,  
Western University

**Co-Investigator:**
Mona Madady, MSc candidate  
Health and Rehabilitation Sciences Graduate Program  
Western University

**LETTER OF INFORMATION – Generic (anyone except the faller who was directly or indirectly involved in the fall)**

This letter contains information to help you decide whether or not to participate in this research project. It is important for you to know why the data is being collected, why the research is being conducted and what we are asking you to agree to. Please take the time to read this carefully and feel free to ask questions if anything is unclear.

Recently, a stroke survivor experienced a fall or near fall in the Stroke Rehabilitation unit at Parkwood Hospital. An investigator trained in the Systemic Falls Investigative Method is assigned to investigate the occurrence of this adverse event. The investigator will interview you and others involved to collect detailed information about things that contributed to the fall. Interviews might be audio taped and the location of the fall might be photographed. This investigation is done to better understand causes of falling and improve the safety of stroke survivors. This procedure is not different from usual follow-up after a fall in a hospital with the exception that the information will be de-identified (your name or identity will not be revealed) and entered into a Systemic Falls Investigative Method Database (from here on called Falls Database). We are asking for your permission to collect and use the information from your interview for research purposes.

If you agree to participate, data you provide will be reviewed, summarized and included in the Falls Occurrence Report which is created by the Falls Database. All identifying information such as your name or contact telephone number will be removed and the information in the Falls Database will be identified only by a unique code number. The Principal Investigator will keep the master list of codes in the Falls Database in a secure location at Western University. The Falls Database is managed by EmPower Health Research Inc. and is stored on a secured web server. The data in the Database will be
retained indefinitely to allow us to look at trends over time. The data may potentially be shared with other researchers but it will not include any personal identifiers. The consent to participate in the study will be retained at Western University.

Participation in this study is voluntary. You may refuse to participate, or refuse to allow data to go to the Falls Database at any time. If you wish to stop your participation just let the investigator know.

Your decision to participate will not influence your relationship with the faller or the organization/place where the fall occurred. You do not waive any legal rights by signing the consent form.

If the results of the research are published or presented at scientific meetings, your name will not be used and no information that discloses your identity will be released or published without your explicit consent.

You will not be compensated for your contribution to this Database.

There are no known risks to your participation in this study. All records and the Falls Database are secured and access is limited to authorized personnel only.

You will not benefit directly from participation in this research however the results of our research may help other stroke survivors in the future who experience similar falls.

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research. If you have any questions about the research or the database you may contact Dr. Aleksandra Zecevic. She can be reached at ... . If you have any questions about your rights as a research participant or the conduct of the study you may contact Dr. David Hill, Director, Office of Research Ethics at the University of Western Ontario at ... .

This letter is for you to keep. You will also be given a copy of the consent form if you agree to sign it.

Thank you very much.
Appendix G: Consent Form-Generic

Improving safety and preventing falls in stroke survivors through the continuum of care

Principal Investigator:
Aleksandra Zecevic, PhD
Faculty of Health Sciences,
University of Western Ontario

CONSENT FORM

I have read the Letter of Information and have had the nature of the Systemic Falls Investigation Method Database explained to me, I agree to participate. All questions have been answered to my satisfaction.

Name of participant (Print)

Signature of participant Date

Name of legally authorized representative (Print) (If appropriate)

Signature of legally authorized representative (If appropriate) Date

Name of person obtaining consent (Print)

Signature of person obtaining consent Date
Appendix H: Mini Mental State Exam

Mini Mental State Examination

The Mini-Mental Status Examination offers a quick and simple way to quantify cognitive function and screen for cognitive loss. It tests the individual’s orientation, attention, calculation, recall, language and motor skills. Each section of the test involves a related series of questions or commands. The individual receives one point for each correct answer.

To give the examination, seat the individual in a quiet, well-lit room. Ask him/her to listen carefully and to answer each question as accurately as he/she can. Don’t time the test but score it right away. To score, add the number of correct responses. The individual can receive a maximum score of 30 points. A score below 20 usually indicates cognitive impairment.

The Mini-Mental Status Examination
Name: ____________________________________  DOB: __________________
Years of School:_____________________________ Date of Exam: ___________

Mark as CORRECT/INCORRECT

Orientation to Time
What is today’s date?  ↑  ↑
What is the month?  ↑  ↑
What is the year?  ↑  ↑
What is the day of the week today?  ↑  ↑
What season is it?  ↑  ↑

Total: ____/5

Orientation to Place
Whose home is this?  ↑  ↑
What room is this?  ↑  ↑
What city are we in?  ↑  ↑
What county are we in?  ↑  ↑
What state are we in?  ↑  ↑

Total: ____/5

Immediate Recall
Ask if you may test his/her memory. Then say “ball”, “flag”, “tree” clearly and slowly, about 1 second for each. After you have said all 3 words, ask him/her to repeat them – the first repetition determines the score (0-3):
Ball  ↑  ↑
Flag  ↑  ↑
Tree  ↑  ↑

Total: ____/3

Attention
A) Ask the individual to begin with 100 and count backwards by 7. Stop after 5 subtractions.
Score the correct subtractions.
93  ↑  ↑
86  ↑  ↑
OR

B) Ask the individual to spell the word "WORLD" backwards. The score is the number of letters in correct position.
D  ↑  ↑
L  ↑  ↑
R  ↑  ↑
O  ↑  ↑
W  ↑  ↑

Total: _____/5

Delayed Verbal Recall
Ask the individual to recall the 3 words you previously asked him/her to remember.
Ball  ↑  ↑
Flag  ↓  ↓
Tree  ↓  ↓

Total: _____/3

Naming
Show the individual a wristwatch and ask him/her what it is. Repeat for pencil.
Watch  ↑  ↑
Pencil  ↑  ↑

Total: _____/2

Repetition
Ask the individual to repeat the following:
“No if, ands, or buts”  ↑  β-Stage Command

Total: _____/1

Complex Commands
Give the individual a plain piece of paper and say, “Take the paper in your hand, fold it in half, and put it on the floor.”
Takes  ↑  ↑
Folds  ↑  ↑
Puts  ↑

Total: _____/3

Reading
Hold up the card reading: “Close your eyes” so the individual can see it clearly. Ask him/her to read it and do what it says. Score correctly only if the individual actually closes his/her eyes.

Total: _____/1
Writing
Give the individual a piece of paper and ask him/her to write a sentence. It is to be written spontaneously. It must contain a subject and verb and be sensible.

Copying
Give the individual a piece of paper and ask him/her to copy a design of two intersecting shapes. One point is awarded for correctly copying the shapes. All angles on both figures must be present, and the figures must have one overlapping angle.

Total: _____/1

Total Score:_____/30
Appendix I: Stroke Survivor Contact Information Form

Stroke Survivor Contact Information Form
PLEASE KEEP CONFIDENTIAL

ID Code: ______

Contact Information

Name: __________________________________________________________

Gender (please circle):      Male        Female

Address:
Street number and name:____________________________________________

Apartment #: ______________________

City: _____________________________

Postal code: _______________________

Home Phone Number: (        ) ___________________________

E-mail Address: ______________________________________

Primary caregiver or legally authorized representative:
______________________________________________

Relationship to patient: __________________________
Appendix J: Consolidated Codes

**Stroke Study - Consolidated Codes**

<table>
<thead>
<tr>
<th>#</th>
<th>Code</th>
<th>Sub-code A</th>
<th>Sub-code B</th>
<th>Description and examples</th>
<th>Setting</th>
</tr>
</thead>
</table>
| 1 | Unsafe Acts and Decisions    | Rushing            |            | Stroke survivor, caregiver or a member of the healthcare team is rushing to complete a task.  
Example: *Faller rushes from kitchen to living room to close door before baby gets outside.* |         |
| 2 |                               | Multi-tasking      |            | Stroke survivor, caregiver or a member of the healthcare team is doing more than one thing at the same time.  
Example: *Faller is multi-tasking.* |         |
| 3 |                               | Striving for independence |              | Any attempt by the stroke survivor to maintain their independence. Includes: independent and unsupervised transfers and waiting for assistance with transfers. This is sometimes implied and not explicitly stated. Related to independent transfers. Double code where applicable.  
Example: *Faller attempts to transfer to his bed on his own.* |         |
|   | 4 | Over-reaching | All incidences involving extending too far or beyond something.  
Example: Faller reaches forward and to the side with left arm. |   |
|---|---|--------------|------------------------------------------------------------------|---|
| 5 | 5 | Other unsafe acts or decisions | All other unsafe acts or decisions by stroke survivor, caregiver or healthcare team that do not include rushing, multi-tasking, striving for independence or over-reaching.  
Example: RN goes to the door to call for assistance. |   |
| 6 | 6 | Balance | Any issues related to balance, including poor balance, loss of balance, poor postural control, poor trunk control, poor dynamic balance, and poor coordination. Could be in relation to either the stroke survivor or anyone else involved in the falls incident.  
Example: Faller loses balance, PCP loses balance, Faller has poor coordination. |   |
| 7 | 7 | Ignored warning signs / Missed opportunities / Failure to learn | Includes: standard practice is left unchanged, falls prevention strategies are left unadjusted after a previous fall, or previous attempts at unsafe acts; Best Practice Guidelines are not followed; note learning from previous mishaps; only following procedures (filling out adverse events reports without follow-up); previous falls. Does not include: issues with falls prevention program (code 27) or community health services (code 31).  
Example: Faller experiences first fall at acute care hospital while trying to go to the washroom by himself. |   |
<table>
<thead>
<tr>
<th></th>
<th>Assistive devices (AD)</th>
<th>Any issues with ADs including poorly fitting ADs, uncomfortable ADs, delay in receiving ADs, repairing ADs, new ADs, unfamiliarity with ADs and the comfort, efficiency and design of the ADs. Does not include bed rails (code 24). May overlap with novelty (code 33). <em>Example: Faller was previously using a generic hospital wheelchair that did not fit him well.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Stroke consequences</td>
<td>Physical All physical conditions related to the stroke: specific stroke diagnosis, hemiplegia, left side neglect, dysphasia, aphasia, dysarthria, left sided neglect (linked to impulsiveness). <em>Example: Faller is hemiplegic on left side.</em></td>
</tr>
<tr>
<td>10</td>
<td>Needs due to Physical Consequences</td>
<td>The need for assistance with activities of daily living; issues with recovery time or hospital stay. <em>Example: Faller needs assistance from at least one person for all transfers.</em></td>
</tr>
<tr>
<td>11</td>
<td>Cognition</td>
<td>All conditions related to cognition including, poor short term memory, disorientation, confusion, lack of insight into one's disability, drowsiness, and applying instructions to new situations. <em>Example: Faller has difficulty with memory.</em></td>
</tr>
<tr>
<td>12</td>
<td>Impulsiveness</td>
<td>All conditions related to the stroke survivor acting impulsive including, agitation, anxiety, restlessness, over-estimating one’s ability, over-confidence in one’s ability, not listening to or following instructions. <em>Example: Faller over-estimates his ability to transfer independently due to better-fitting wheelchair.</em></td>
</tr>
<tr>
<td>13</td>
<td>Depression</td>
<td>Includes: no motivation for therapy, isolation, depression. <em>Example: Faller has no motivation to recover.</em></td>
</tr>
<tr>
<td>14</td>
<td>Muscle weakness</td>
<td>Includes: leg gives out, elbow gives out, arm gives out, muscle atrophy, not strong enough, fatigue, frailty, and impaired mobility.. <em>Example: Faller is not strong enough to support his weight.</em></td>
</tr>
<tr>
<td>15</td>
<td>Medications</td>
<td>Any issues related to medications, including poly-pharmacy and side-effects. <em>Example: Faller is on 12 prescription medications.</em></td>
</tr>
</tbody>
</table>
| 16 | Comorbidities | Other illnesses and health issues such as MS, neuropathy, PD, BP, osteoporosis, bradycardia, transient loss of consciousness, incontinence, pain, sleep apnea, poor diet, ulcers, etc.  
Example: Faller suffers from degenerative disc disease. |
| 17 | Communication | Patient | Includes all issues related to the stroke survivor’s communicating to others, language barriers, inappropriate speech, or not talking to others due to fear of worrying them.  
Example: Faller thinks nurses are busy and doesn’t want to bother them. |
| 18 | Staff | Staff to staff | Any issues related to communication between members of the healthcare team. Includes: communication between staff during shift change, communication to new staff, poor safety discussions or information sharing.  
Example: During shift change verbal reporting, RN #3 was not informed of faller’s anxiety, impulsive behavior and previous occupation. |
| 19 | Useless repetition of instructions | Ineffective repetition of instructions to cognitively impaired patients.  
Example: Staff continuously reminds the faller to use the call bell. |
| 20 | Poor adherence to instructions | Stroke survivors do not follow or adhere to instructions.  
*Example: Faller does not adhere to staff instructions.* |
|---|---|---|
| 21 | Call bells | Any issues related to the call bells, including inefficiency of the call bell system, patients waiting for call bell call to be answered, the responsibility of answering the call bell. Where appropriate, double code with instructions to use the call bell (code 18) or stroke survivor’s reluctance to use the call bell (code 19).  
*Example: Usual nursing practice is to call for help from the door rather than to use the call bell because the centralized call bell system is inefficient.* |
| 22 | Supervision | Formal  
Patient to staff ratio | Any issues related to staff to patient ratios, including drop in staffing levels during lunch breaks, at night, and during the 30 minutes verbal reporting period at shift change. Closely related to but does not include issues related to workload (code 21). Double code where appropriate.  
*Example: RN to patient ratio during the night is 1:7.* |
| 23 | Workload | Issues related to workload whereby the quality of care is compromised due to heavy workloads. Includes: RNs are very busy, bypassing recommendations from manufacturers, PT skipping full assessments, no time for better patient supervision, PT leaving patients unsupervised after therapy sessions due to heavy workload, shortage of PTs/RNs/OTs in hospital.  
*Example: Faller is left unattended in the room.* |
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| 24  | Staff unaware                    | Issues related to staff being unaware of patients’ activities when left unsupervised or patient’s fluctuating medical condition. Double code when needed.  
*Example:* RN is unaware of swelling in faller’s left leg. |
| 25  | Supervised transfers             | Transfer of stroke survivor from one position to another is supervised by health care provider or informal caregiver.  
Does not include unsupervised or attempts to independently transfer (code 3).  
This is usually implied and not explicitly stated. Evident when looking at SOEs, where a staff member is present.  
*Example:* PCP’s position is inappropriate for transferring this patient. |
| 26  | Inadequate transfer instructions | Includes any issues related to misinformed transfer instructions such as misleading information on transfer status charts posted above patient’s bed.  
*Example:* Transfer chart does not take into account size of care providers. |
| 27  | Restraints                       | Any issues related to the use of restraints. Includes restraint policies, bedrails, lap trays used as forms of restraint, the use of hired sitters in place of restraints. Does not include informal caregivers/family members used as sitters or obtaining informed consent for the use of restraints (code 26).  
*Example:* RN places the Pinel system waist restraint with beavertail attachment on faller. |
<table>
<thead>
<tr>
<th>Topic</th>
<th>Code</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies</td>
<td>28</td>
<td>Any topic related to hospital policies or best practice guidelines in relation to supervision. Includes lack of policies to increase supervision. <em>Example: Due to aphasia and GJ tube inserted earlier in the day, the faller requires frequent supervision.</em></td>
<td></td>
</tr>
<tr>
<td>Informal</td>
<td>29</td>
<td>Any issues related to informal caregivers before stroke survivor is discharged from hospital. Includes informed consent for the use of restraints, issues with finding or paying for sitters, family members acting as sitters, and any issues that were not discussed with family members. Does not include informal caregiver issues post discharge (code 35). <em>Example: Monitoring strategies were discussed with faller’s wife in lieu of restraints but were never implemented.</em></td>
<td></td>
</tr>
<tr>
<td>Inadequate falls prevention</td>
<td>30</td>
<td>Any topics related to falls prevention strategies and programs. Includes: falls assessments, reactive falls prevention strategies where something is done only after the fall. <em>Example: Faller is assessed at high risk for falls but individualized falls prevention strategy is not put in place.</em></td>
<td></td>
</tr>
<tr>
<td>Transitions of Care</td>
<td>31</td>
<td>Any issues related to the transfer of information at the time of discharge: from one hospital to another, from hospital to long-term care, incomplete or wrong information transferred, falls history not communicated, falls prevention not discussed at discharge. <em>Example: Information about falls is not high priority during exchange of patient information when patients transfer between hospitals.</em></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Changes post discharge</td>
<td>Long-term health changes</td>
<td>Any changes in the stroke survivor’s health status post-discharge such as dizziness, frequent losses of balance and transient loss of consciousness. The stroke survivor is expected to adjust to and live with this new normal. Related to code 6, 9 &amp; 15. Must look in context of whole case. Mostly found in community. Double code where needed. Example: Faller has frequent dizzy spells.</td>
</tr>
<tr>
<td>33</td>
<td>Environmental challenges post discharge</td>
<td>Any issues related to the home environment of the stroke survivor post discharge from hospital. Includes: inadequate assessment of home environment by CCAC or CSRT, no changes made to home environment upon return home from hospital, stroke survivor has to learn to adapt to hazardous environments. Similar to code 31 but all home safety assessment issues should be included in this code. Example: OT safety assessment does not include assessment of furniture.</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Community health services</td>
<td>Any topic related to: poor or non-existent support, inadequate follow-up, lack of community outreach policies and practices, lack of community involvement with stroke survivor or stroke survivor’s family before or after the stroke, issues with doctors post discharge, inadequate support from CCAC or CSRT. Example: Faller has minimal assistance with grocery purchase and no assistance with meal preparations.</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Challenges for informal caregivers</td>
<td>Topics related to informal caregivers (ICG) post discharge from hospital. Include: ICG not given enough training, support or resources to deal with new challenges of caring for a recovering stroke patient, ICG is unable to supervise adequately due to his/her own health issues, or ICGs are burnt out with the level of care they are expected to provide, ICGs are untrained, unprepared, overwhelmed or uninvolved, and isolated (sole care provider for stroke survivor). Example: EMU did not provide fiancé with any support or training to help her cope with faller’s frequent dizzy spells and falls.</td>
<td></td>
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<tr>
<td></td>
<td>Novelty</td>
<td></td>
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<tr>
<td></td>
<td>Includes all issues related to Something new and unexpected happening</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>close to the event. Double code where appropriate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Example: The custom-fitted wheelchair is new, faller received it</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>yesterday. This is the first time the RN is caring for this patient.</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All other bullet points in Swiss Cheese tables that were not included</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>in any other code.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Example: Faller woke up. Faller is 175.3 cm tall and weighs 81.8 kg,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RN is approximately 160 cm tall and weighs 60 kg. Faller has 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>children, Faller is only wearing socks.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix K: Full Case Reports

Case 16336: From Restraints to Floor
Case 16727: Bedrail Climber
Case 16763: Impatient Lunchtime Transfer
Case 16774: Frequent Faller, Frail and Isolated
Case 16960: Hanging by Restraints Trying to Escape
Case 16961: Night Walker
Case 14770: Transfer with Over-confidence
Case 16443: Grumpy Lack of Insight
Case 16767: Buckled Knee Near Fall
Case 17914: Leaning on Wall Near Fall
Case 17915: Left-sided Brain Neglect Wheelchair Transfer
Case 17698: Leaving Room in Socks
Case 18303: Assisted to Washroom by Pregnant PCP
Case 18675: Sliding off Wheelchair
Case 18677: Having a Bad Day Trying to go to Bed
Case 16776: Fiance Catch
Case 16959: Reaching for Blanket
Case 16958: Tripped Over Baby
Case 17918: Picking Up Mail
Case 18758: Feeling Dizzy Near Fall in the Shower
Case 17917: Falling Down Basement Stairs
SFIM Investigative Report

From Restraints to Floor
Fall Information

2.1 Date of the fall: 2012-04-30
2.2 Day: Monday
2.3 Time of fall: 24-hour clock
   5:20
2.4 Witnesses: Witnessed
   Number of people at the scene? 1
2.5 Location of the fall:
   - Indoors
   - Public building (includes hospitals or long term care homes)
   - Hospital or LTC room
2.6 Activity at the time of the fall:
   - Standing on both feet
2.6a Was this person multi-tasking? No
2.7 Action by the faller prior to loss of balance:
   - Transferring (in-out bed, in-out seat, in-out wheelchair)
2.8 Type of fall:
   - Slide against a wall or an object
2.9 Direction of the fall:
   - Down (as in collapse)
2.10 Environment at the fall location:

☑️ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑️ None

2.12 Footwear worn by the faller at the time of the fall:

☑️ Shoes

2.13 How did faller get up after the fall?

☐ Assisted by another person

☑️ Nurse/Other staff

Please specify how the faller was assisted:

☑️ Manual Aide (e.g. cane/walker/wheelchair)

☑️ Manual lift (no aide by device)

2.14 Injury? ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

Night nurse was from NRU and unfamiliar with patient.
3.1. Demographics:

Year of birth: 1957  
Gender: Female

Population (Check all that apply):  
☐ Senior  
☐ Acquired brain injury  
☐ Cognitive impairment (Check only if permanent)  
☐ Stroke survivor

Age Calculated: 55

3.2 Falls history:

☐ Multiple faller (falls regularly)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Number of falls in the last week: 4
Number of falls in the last month: 4
Number of falls in the last year: 4

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

☐ Unknown

3.4 Marital status:

☐ Married

3.5 Mental status:

☐ Confused or disoriented

☐ Other, please specify:

impulsive

3.6 MMSE score:

☐ Not available

3.7 Education:

☐ Secondary school partial

3.8 Mobility aids:
11 Number of prescription medications used by the faller on the day of the fall

Medication Name:

- Amitriptyline
- Carvebilol
- Citalopram
- Dalteparin
- Docuste Sodium
- Acrilube opthalmic ointment
- Lansoprazole
- Leflunomide
- Levetiracetam
Levothyroxine

Medication Name:

Metformin

0  Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 55 year old stroke survivor, fell on the floor on Monday, April 30, 2012 at 05:20. When the night shift registered nurse (RN) woke the faller up to check for incontinence, the faller expressed the need to go to the washroom. The RN released the restraints, put on the faller’s shoes and assisted her to stand up. The RN then realized that the faller was unsteady on her feet and that she needed more assistance to walk the faller to the washroom. The RN assisted the faller to sit back down on the bed, waited a few minutes to be sure that the faller could sit independently without losing balance and instructed her to remain seated. She went to the room entrance to call for assistance from another nurse at the front desk. When the RN turned towards the faller, she saw that the faller had stood up on her own. Since the faller could not stand on her own, she slowly slid down from the edge of the bed to the floor. The second nurse entered the room and the faller was assisted to the bed by two RNs and assessed for injuries. The faller did not sustain any injuries. She was then taken to the washroom.

The faller
This 55 year old stroke survivor had previously sustained a subarachnoid hemorrhage in 1984 and had her right middle cerebral artery aneurysm clipped. She had a re-bleed with subarachnoid hemorrhage in 1986 and another re-bleed in 1988 due to an arteriovenous malformation which was partially resected surgically. She also had surgery for a Chiari I abnormality in the 1990s and the insertion of a ventriculoperitoneal shunt. Faller was admitted to the intensive care unit (ICU) on January 13, 2012 with a large left temporal hematoma with extension into the ventricular system. Between February 18, 2012 and April 22, 2012, she underwent eight operative procedures for external ventricular drainage, clipping posterior cerebral artery and removal of ventriculoperitoneal shunt, ventriculoperitoneal shunt revision, and replacement of shunt due to infection. She was transferred from the ICU to the neurosurgery unit for further treatment and recovery on April 22, 2012. Faller was receiving physiotherapy and occupational therapy after her surgeries. She showed some improvement in her physical abilities however, there was decline in her cognitive abilities. She remained confused, disoriented to time and place and showed impulsive behavior. Her progression during her stay in the neurosurgery unit was slow but steady. She showed improvements in transferring independently from lying to sitting positions but still required assistance from one to two persons when walking. Her balance during standing and walking fluctuated due to her reduced cognitive abilities and impulsive behavior. The faller was able to follow commands but did not remember instructions. After her last surgery, she was diagnosed with aphasia. On April 25, 2012, she was put on restraints to prevent her from falling as well as pulling out tube feeds. The extensive number of procedures she underwent resulted in reduced cognitive capacity, poor short term memory, impulsive behavior and a reduced ability to effectively communicate with staff and family. It was noted by the healthcare team that the faller “had no ability seemingly to lay down new memories.” Given the severity of her illness, the multiple complications and issues encountered related to her large subarachnoid and intraventricular hemorrhage, the faller remained disoriented for the duration of her stay in acute care as well as the rehabilitation hospital.

The faller wore incontinence briefs and was often unable to control the passing of urine. However, she still notified staff during their regular checks if she felt the urge to urinate and preferred to be taken to the washroom. The faller was identified as high risk for falls using the Morse Fall Scale. This information was written on the nursing Kardex (a quick summary of patient’s care needs used by nurses). She had a “high risk for falls” wrist band placed on her wrist as well as a sign posted above her bed. Prior to the investigated fall, she had three other falls while in the acute care hospital. During her first fall on April 24, 2012, the faller tried to climb over the bedrails. She later sustained a bruised knee and shoulder when she fell out of bed after restraints were taken off on April 26, 2012. She fell for a third time when she slipped out of bed again on April 26, 2012. These three previous falls were not investigated because the family initially refused to provide consent to participate in the study.

Environment
At the time of the fall the faller was in a two-person room where the second bed was unoccupied. The room was well-lit and the faller’s bed was closest to the window. The washroom was 6 meters away from the bed and she was always assisted to the washroom by nurse(s) and sometimes her husband.
Family
The faller’s husband and sister-in-law visited the faller on a daily basis at varying times. Faller’s husband was very supportive and patient with his wife’s recovery. The evening before the fall (April 29 at 19:30) the faller’s husband, along with the nurse assisted the faller to the washroom. The faller’s family was upset and frustrated with the number of falls the faller had during her hospital stay and although they refused consent to participate in the study at an earlier time, they later changed their minds and agreed to participate in this study in hopes of finding a solution.

Restraints
Due to ongoing confusion, impulsive behavior and previous falls, the faller was placed on restraints after being assessed as high risk for falls. Restraints were also used because the faller often forgot where she was and would try to escape. As per hospital policy, consent from the faller’s husband was obtained and wrist restraints were placed while the faller was in bed. The bed rails were also used to prevent the faller from getting out of bed. Restraints were usually removed while the faller’s family was visiting because they would supervise her and remind her if she attempted to get out of bed. On the day of the fall, wrist restraints were used while the faller slept. However, when the nurse assisted the faller out of bed to use the washroom, she removed the restraints and did not put them back on when leaving the faller to call for help.

The Nurse and the Nursing Resource Unit
The night RN was from the Nursing Resource Unit (NRU), and was unaware of the patient’s fluctuating level of balance while walking. While assisting the faller to the washroom with the help of faller’s husband earlier that evening, the night RN judged that assistance from one person would have been sufficient. Faller’s medical records also indicated that she required assistance from only one person for that day. According to the night R, “she was more steady in the evening so I thought I could do it on my own, but she was unsteady in the morning, probably because she just woke up.”

The NRU was a dynamic staffing strategy recently developed at this acute care hospital. The NRU team was made up of full-time and part-time nurses who were assigned to a variety of clinical areas in response to staffing needs. Staff were booked for full shift and were assigned a certain number of patients. NRU nurses were assigned to multiple units, referred to as clusters, based on their interest, expertise and learning needs. The clusters, based on specialty and common competencies and skill sets, were: medical/surgical, critical care, women’s health, pediatrics and psychiatry. Nurses in the NRU were provided with a comprehensive orientation and competency development program. Nurses could be cross-trained into multiple clusters based on interest and career goals.

The night nurse had been working in the NRU at the acute care hospital for 1.5 years. During this time she worked with different units in the hospital based on staffing needs. She previously had four years experience working with stroke patients in a rehabilitation hospital. She had taken care of the faller once before three weeks ago. However, during her prior shift with the faller she did not walk her anywhere as faller was not yet stable enough to stand. During her shift on April 30, 2012, the night of the fall, the night RN was taking care of 5 other patients, which she found to be manageable. The night RN mentioned that she usually started to feel fatigued around 03:00 when she worked night shifts.

RNs in the unit were required to check on their patients every 2 hours. They always checked on the patient (to make sure they were still breathing). According to nursing leaders, “because there are some patients who are quite confused and Sundown (Sundown syndrome is a term that describes the onset of confusion and agitation that generally affects people with dementia or cognitive impairment and usually strikes around sunset) at night - if it takes these patients longer to finally fall asleep, the RN might skip one check or space it out to every 3 hours. They will still check in on these patients but they may let them sleep a bit longer before waking them. This is a difficult one because you don’t want to leave someone in a wet ends however, sleep is a huge part of the brain’s recovery process”.

Call bells
Call bells used in the unit were the Dukane StaffCallPro Nurse Call System (Dukane was acquired by General Electric in 2006). When a call bell button was pushed by a patient, a central telephone located at the main clerk’s station rang and flashed the room number. A light above the room and one above the hallway entrance also lit up. The call bell phone at the main desk was sometimes answered by the clerks or by the nurses without consistency. If the phone was answered by a clerk, she was required to tell the appropriate nurse or any available nurse to assist the patient. This created additional work for the unit clerks. Patients who were disoriented and confused often used
the call bell inappropriately. The call bell telephone at the front desk was often ignored and rang for long periods of time, sometimes up to 3-4 minutes. There were no clear instructions as to who was responsible for answering the call bells. Nurses and clerks had expressed dislike and dissatisfaction with the call bell system.
When the night RN realized that she needed assistance walking the faller to the washroom, she chose to “pop her head out of the room to call for help” instead of using the call bell located on the faller’s bed. The night RN stated that “either way I would’ve had to take a few steps away from her [faller].” The night RN stated that she “knew that other nurses were sitting at the desk so it would be quicker than using the call bell because sometimes the call bell isn’t answered right away.” She also said that she would use the call bell in emergency situations where she could not leave the patient.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

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StaffcallPro_232.jpg
It is standard practice to check up on patients every 2-3 hours, especially when the patient is cognitively impaired.

The standard practice at the unit for instructing cognitively impaired patients is to continuously repeat instructions to them.

Usual nursing practice is to call for help from the door rather than to use the call bell because the centralized call bell system is inefficient.

No organizational policy exists to inform staff who is responsible for answering the call bell.

A new call bell system was purchased one year ago but not yet installed due to lack of technical support.

- Night RN is from Nursing Resource Unit.
- There is a shortage of regular nursing staff on the unit tonight.
- It is standard practice to check up on patients every 2-3 hours, especially when the patient is cognitively impaired.
- The standard practice at the unit for instructing cognitively impaired patients is to continuously repeat instructions to them.
- Usual nursing practice is to call for help from the door rather than to use the call bell because the centralized call bell system is inefficient.
- No organizational policy exists to inform staff who is responsible for answering the call bell.
- A new call bell system was purchased one year ago but not yet installed due to lack of technical support.

- RN does not put restraints back on the faller before leaving her side.
- Faller needs assistance from at least one person for all transfers.
- Call bell is not answered right away.
- RN believes that faller will follow instructions.

- During the evening washroom transfer, night RN judges that faller only requires assistance from one person.
- Night RN is not familiar with faller's fluctuating ability to balance and need for assistance during transfers.
- Waking patient up at night disrupts her sleep cycle and contributes to her confusion and disorientation.
- Faller has difficulty communicating due to cognitive impairment.
- Faller just woke up.
- Faller is completely disoriented because it is early in the morning.
- Faller suffered a large intracerebral hematoma four months ago.
- Faller has hydrocephalus.
- Faller needs assistance with all activities of daily living.
- Faller lacks insight into her own disabilities.
- Faller does not follow instructions.
- Faller has impaired short-term memory.
- Faller is on 11 medications.
- Faller is impulsive when left unattended.
- Faller has muscle weakness.
- Faller is cognitively impaired.
- Faller has history of neurological disorders and surgeries.
- Faller has difficulty with her balance.
Unsafe Acts:

- Faller is assisted to washroom by night RN and husband. 20:00
- RN wakes the faller up to check for incontinence. 5:10
- Faller is unstable on her feet. 5:18
- RN instructs faller to stay seated. 5:18
- RN goes to the door to call for assistance. 5:18
- Faller tries to stand up on her own. 5:19
- Faller loses control of her balance.
- Faller slowly slides from edge of the bed to floor. 5:20
Conclusions

The faller, a 55 year old stroke survivor, fell on the floor on Monday, April 30, 2012 at 05:20. When the night shift registered nurse (RN) woke the faller up to check for incontinence, the faller expressed the need to go to the washroom. The RN released the restraints, put on the faller’s shoes and assisted her to stand up. The RN then realized that the faller was unsteady on her feet and that she needed more assistance to walk the faller to the washroom. The RN assisted the faller to sit back down on the bed, waited a few minutes to be sure that the faller could sit independently without losing balance and instructed her to remain seated. She went to the room entrance to call for assistance from another nurse at the front desk. When the RN turned towards the faller, she saw that the faller had stood up on her own. Since the faller could not stand on her own, she slowly slid down from the edge of the bed to the floor. The second nurse entered the room and the faller was assisted to the bed by two RNs and assessed for injuries. The faller did not sustain any injuries. She was then taken to the washroom.

Restraints had been placed on the faller the evening before settling in for bed because she often forgot where she was and would try to escape. After deciding to take the faller to the washroom the RN removed the restraints. However, she did not put restraints back on the faller when she decided to step away to call for help from the entrance to the room. The RN also chose not to use the call bell on the faller’s bed because she believed that the call bell was often not answer right away and that it would have taken a longer time to receive assistance if she used the call bell instead of stepping away to call for help. There was confusion among unit staff as to who was responsible for answering the call bell and since most patients in the unit were cognitively impaired, the call bell was often used inappropriately. Therefore, the call bell telephone at the main nursing station was frequently left to ring many times before the appropriate nurse was able to attend to the patient. The call bell was sometimes answered by the unit clerks but this was done inconsistently. The unit clerks had not been clearly instructed that it was their responsibility to answer the call bells. If they answered the call bells they then had to inform the appropriate nurse that his/her patient was asking for help. This was either done by use of the overhead intercom or by finding the nurse and informing him/her. The call bells also malfunctioned at times when either the patients could not be heard properly or the patients could not hear the clerks. A new call bell system had been scheduled to be placed in the unit but at the time of this investigation this change had not yet been implemented, due to a lack of technical support.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* Due to hydrocephalus, large subarachnoid and intraventricular hemorrhages, infections, a lengthy recovery time, multiple medications, and eight surgical procedures, the faller was disoriented, impulsive and cognitively impaired. She had difficulty with short-term memory and in particular with laying down new memories. The faller often did not follow instructions and staff had to repeat instructions constantly. This was the standard practice in the unit for instructing cognitively impaired patients.

* The faller needed assistance with all activities of daily living and always required one to two people assisting her with transfers and ambulation. Because she was impulsive she attempted to get out of bed on her own as soon as the nurse stepped away from her, prior to the fall.

* The faller had muscle weakness and poor balance. She was unstable on her feet when she first woke and rose from bed.

* The night RN was not familiar with the faller’s fluctuating balance and believed that she would be able to manage the transfer to the washroom by herself since earlier that evening, when the faller was alert and fully awake, the night RN was able to assist her to the washroom together with the faller’s husband.

* The RN did not settle faller back into bed before stepping away to ask for assistance. She took off the restraints but did not put them back on after deciding that she needed to go to the door and ask for help from another nurse.

* Due to a shortage of regular nursing staff on the unit, the faller’s RN during the night of the fall was from the Nursing Resource Unit. Although the night RN had previous experience working with stroke patients, she had only cared for the faller once in the past. The RN did not have much experience with the faller’s ambulation and
transfers since the faller was bedridden the last time the RN took care of her three weeks ago.
* The night RN did not use the call bell to call for help since she believed that it would have taken longer to receive assistance if she had used the call bell instead of stepping out of the room to call for help. Overall, the call bell was not answered consistently and promptly, and it often malfunctioned. There were no rules or policy to inform staff whose responsibility it was to answer the call bell. Aware of the current issues with the call bell system, the unit purchased a new call bell system a year ago but due to the lack of technical support, this new system has not yet been installed. The new system allows each nurse to carry a hand held device connected to the specific patients they are caring for. This allows calls made by patients to be sent directly to their specific nurse, bypassing the centralized system at the main nursing station.
Faller has surgery for a Chiari I abnormality, 1990

Faller undergoes surgery for hydrocephalus, 2003

Faller has another re-bleed due to an arteriovenous malformation, 1988

Faller undergoes surgery for clipping of left posterior cerebral artery and removal of ventriculo-peritoneal shunt, Feb 18, 2012

Faller is admitted to the emergency room and diagnosed with a large left temporal intracerebral hematoma, January 13, 2012

Faller is admitted to intensive care unit for subarachnoid hemorrhage, Jan 13, 2012

Faller is transferred to neurosurgery unit, Apr 22, 2012

Faller is restrained for the first time, Apr 25, 2012

Faller is restrained again, April 26-29, 2012

Faller experiences first fall, April 25, 2012

Faller undergoes surgery for shunt replacement due to infection, Apr 22, 2012

Faller has 2 more falls when restraints are removed, April 26, 2012

Faller has dinner, Apr 29, 2012, 19:00

Faller's family arrives to visit faller, 19:30

Faller is assisted to washroom by night RN and husband, 20:00

Faller's family leaves, 20:30

During the evening washroom transfer, night RN judges that faller only requires assistance from one person.

Night RN is not familiar with faller's fluctuating ability to balance and need for assistance during transfers.

Night RN is from Nursing Resource Unit.

There is a shortage of regular nursing staff on the unit tonight.
Faller expresses the need to go to the washroom. 5:16

It is standard practice to check up on patients every 2-3 hours, especially when patient is cognitively impaired.

Waking patient up at night disrupts her sleep cycle and contributes to her confusion and disorientation.

Faller has difficulty communicating due to cognitive impairment.

Faller is sleeping in bed with restraints on. Apr 29, 21:00 - Apr 30, 5:10

RN wakes the faller up to check for incontinence. 5:10

RN finds that the incontinence brief is full. 5:15

Faller expresses the need to go to the washroom. 5:16

RN removes the restraints. 5:16

RN lowers the bedrails on the right side of the bed. 5:16

RN assists the faller to sit up. 5:17

RN puts on faller’s shoes for her. 5:17

RN helps the faller stand up. 5:18

Faller is unstable on her feet. 5:18

RN assists faller to sit back to the side of the bed. 5:18

RN ensures that faller can sit on her own. 5:18

Faller just woke up.

Faller is completely disoriented because it is early in the morning.

Faller suffered a large intracerebral hematoma four months ago.

Faller has hydrocephalus.

Faller needs assistance with all activities of daily living.
RN instructs faller to stay seated. 5:18

The standard practice at the unit for instructing cognitively impaired patients is to continuously repeat instructions to them.

Faller lacks insight into her own disabilities.

Faller does not follow instructions.

Faller has impaired short-term memory.

Faller is on 11 medications.

RN does not put restraints back on faller before leaving her side.

RN looks towards nursing station for assistance without leaving the room. 5:19

RN waves to another RN at nursing station for assistance. 5:19

Another RN at nursing station notices faller's RN asking for help. 5:19

RN turns towards faller. 5:20

Faller slowly slides from edge of the bed to floor. 5:20

RN rushes towards faller. 5:20

Second RN enters room. 5:20

Two RNs assist the faller back onto the bed. 5:20

Faller tries to stand up on her own. 5:19

Faller has muscle weakness.

RN believes that faller will follow instructions.

Faller is cognitively impaired.

Faller has history of neurological disorder and surgeries.

Faller has difficulty with her balance.

Faller needs assistance from at least one person for all transfers.

Faller is impulsive when left unattended.

Usual nursing practice is to call for help from the door rather than to use the call bell because the centralized call bell system is inefficient.

Call bell is not answered right away.

No organizational policy exists to inform staff who is responsible for answering the call bell.

A new call bell system was purchased one year ago but not yet installed due to lack of technical support.
RN checks faller for injuries. 5:21

Two RNs assist faller to the washroom to change the incontinence brief. 5:23
SFIM Investigative Report

Bedrail Climber
Fall Information

2.1 Date of the fall: 2012-05-01
2.2 Day: Tuesday

2.3 Time of fall: 24-hour clock
13:45

2.4 Witnesses: Un-witnessed

2.5 Location of the fall: Indoors
- Public building (includes hospitals or long term care homes)
- Bedroom

2.6 Activity at the time of the fall:
- Standing on both feet

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
- Rising out of bed, chair, toilet, bath
- Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:
- Slide against a wall or an object

2.9 Direction of the fall:
2.10 Environment at the fall location:

- Bed railing
- Transition between surfaces

2.11 Mobility aid used at the time of the fall:

- None

2.12 Footwear worn by the faller at the time of the fall:

- Socks only

2.13 How did faller get up after the fall?

- Assisted by another person
  - Nurse/Other staff

Please specify how the faller was assisted:
- Manual Aide (e.g. cane/walker/wheelchair)

2.14 Injury?  No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

- No
3.1. Demographics:

Year of birth: 1957       Age Calculated: 55
Gender: Female
Population (Check all that apply):
☑ Stroke survivor

3.2 Falls history:
☑ Rare faller (fell only this one time in the past year)

3.4 Marital status:
☑ Married

3.5 Mental status:
☑ Confused or disoriented
☑ Depressed
☑ Other, please specify:
Loss of memory.

3.6 MMSE score:
☑ Not available

3.7 Education:
☑ College or equivalent completed

3.8 Mobility aids:
☑ Assistance by another person ☐ All of the time

☑ Wheelchair ☐ All of the time

3.9 Other aids used by the faller:
☑ Bathroom grab bar
☐ Glasses
☐ Handrail

☐ Shower chair

3.10 Medical problem at the time of the fall:

☐ Blood pressure (high or low)

☐ Depression

☐ Incontinence

☐ Muscle weakness

☐ Stroke Functional Independence Measure Score (Maximum score 126):
  ☐ Not available

Montreal Cognitive Assessment Score (Maximum score 30):
  0

Montreal Cognitive Impairment Score (MoCA < 26):
  ☐ Not available

☐ Other, please specify:

Difficulty swallowing

3.11 Medications:

6 Number of prescription medications used by the faller on the day of the fall

Medication Name:
Amlodipine 7.5 mg PO q12 h

Medication Name:
Citalopram 20 mg GJ tube daily

Medication Name:
Dalteparin 5000 units/0.2 ml

Medication Name:
Docusate sodium syrup 100mg

Medication Name:
Protein flush

Medication Name:
Lansoprazole 30 mg

0 Number of over-the-counter medications used by the faller on the day of the fall
Summary of the fall:

The faller, a 55 year old female stroke survivor, fell to the ground on May 1, 2012 at 13:45. After several hours of lying in bed, the faller felt the urge to urinate and decided to use the washroom by herself despite being instructed by her nurse to call for help. She sat herself up in bed by using the bedrails and then slowly climbed over the bedrails. She then stood by her bedside, only to realize that she was unable to walk to the washroom due to poor balance, coordination and strength. Thus, she decided to climb back into bed but was unable to do so. Instead she chose to slowly lower herself to the ground where she lay for approximately 10-15 minutes. The cleaning staff noticed her lying on the floor and notified her nurse. The faller was then assisted back into bed by two nurses. She was assessed for injuries but none were found. The room was only occupied by the faller and there were no witnesses at the time of the fall.

The faller:

Prior to her stroke the faller was a healthy, well-functioning, middle-aged woman. The faller was admitted to the emergency room (ER) on January 16, 2012 with a post-coital headache. In the ER she suddenly lost consciousness and became unresponsive and was subsequently intubated and seen by the neurosurgery team. A CT scan was performed and showed intraventricular blood with hydrocephalus as well as a large clot in the posterior fossa going into the 4th ventricle. The patient was then taken to the operating room and a craniectomy of the posterior fossa was performed for evacuation of clot. The neurosurgery team also found the arteriovenous malformation (AVM), which they removed. She was transferred to the Critical Care Trauma Centre postoperatively as she remained intubated, sedated and paralyzed. Her progress between February and March was slow. The faller was fairly stable postoperatively, however, due to an extensive tongue swelling the team was reluctant to extubate her. On February 1, 2012 a tracheostomy was performed. Fallers neural recovery while at the acute care hospital was slow. She made some progress but then plateaued. On February 4, 2012 the faller was transferred to another acute care hospital within the city for closer observation by the neurosurgery team. On February 5, 2012 the faller had a lumbar procedure done to assess for suspected infections due to her decreasing level of consciousness. On February 14, 2012 a cerebral angiogram was performed to confirm a residual AVM and on March 22, 2012 this residual AVM was removed. All these events and surgeries resulted in reduced cognitive capacity and reduced ability to communicate with staff and family.

The faller’s speech function was an issue throughout her stay. She appeared to have developed cerebellar mutism, a unique postoperative syndrome typically arising 1 to 2 days after removal of a midline posterior fossa tumor; it consists of diminished speech progressing to mutism, emotional lability, hypotonia, and ataxia. The faller was able to mouth a few words but her voice appeared to be quite weak and her spontaneous speech output was poor. Her speech appeared to be “gargled” due to excessive saliva accumulating in her mouth. She used thumbs up to communicate. Although she received speech therapy, she made very little progress in her verbal abilities and issues with her tongue swelling prevented her from speaking.

Other issues encountered during her hospital stay included: dysphagia, hydrocephalus, which seemed to resolve itself, urinary tract infections due to catheterization, chest/tracheostomy infection, depression (started antidepressants on April 18, 2012) and an earlier fall (February 21 @ 05:00) which resulted in a head injury. The nature of this initial fall was very similar to the one being investigated presently (i.e. Fallers attempted to climb out of bed independently). The patient remained fairly weak in all extremities; she responded to simple commands and was not able to produce full sentences.
The faller wore incontinence briefs and was often unable to control the passing of urine. However, she preferred to use the washroom and during regular checks would notify nursing staff if she felt the urge to urinate. Instructions for her transfers indicated that she should be assisted by a minimum of one person and usually two people, depending on the size of the person doing the transfer. The faller was 178 cm tall and weighed 84 kg. The faller was unable to walk independently.

During her stay in the intensive care unit from January 19, 2012 to February 2, 2012, the faller was started on tube feeds which she received for 18 hours per day from 16:00-10:00. At the time of the fall, the faller was attached to tube feeds. This schedule continued until May 2, 2012 when it was changed to 12 hours nocturnal regimen in preparation for her discharge to a rehabilitation hospital.

Environment

At the time of the fall the faller was in a two-patient room where the second bed was unoccupied. The room was well-lit and the faller’s bed was closest to the window. The washroom was 6 meters away from the bed and she was always assisted to the washroom by nurse(s) or her husband. The immediate physical environment in the room was in good repair.

Faller’s husband and family

The faller’s husband was a self-employed gentleman who was very supportive and highly involved with his wife’s recovery. He visited her every day from 15:00-20:00 and often supervised her and took her for outings around the hospital. The faller also had two daughters who attended university and often visited their mother in the evenings. According to hospital policy, if a patient requires constant supervision, the family is invited to either hire sitters or stay with the patient if they are concerned with the patient injuring themselves.

Restraints

After her first fall on February 21, 2012, and several attempts to pull out the feeding tubes due to confusion and impulsivity, the medical team found the use of physical restraints necessary. As per hospital policy, her husband’s consent was obtained and wrist restraints were placed while the patient was in bed. The bed rails were also used to prevent the patient from getting out of bed. However, the patient soon learned how to climb over or squeeze between the bedrails to get out of bed. When the patient was sitting in a chair by her bed, a lap tray was used to act as a restraint because it prevents patients from getting up. On the day of the fall, staff observed and reassessed her using the restraint policy algorithm and decided that restraints were no longer needed. According to the hospital policy administration document entitled Use of Restraint: “restraint use must be reassessed by the Health Care Team and the Patient/Family/Substitute Decision Maker at a minimum every 24 hours and the rationale for continued use must be documented”. In this situation, the hospital protocol was followed.

Call Bell

The patient was repeatedly instructed by her healthcare team to use the call bell and although she gave the impression that she understood the instructions (by using thumbs up) she never used the call bell to call for assistance. The call bell remote control was placed in her bed and was easily accessible.

The bed and bedrails

The hospital beds in this unit are the Upgradeable Advance Series manufactured by Hill-Rom (http://www.hill-rom.com/canada/index.asp). These beds feature tuckaway siderails both at the head end as well as the foot end. The bed measures at 231 cm from headboard to footboard (length) and 105 cm from siderail to siderail (width). The height of the bed measures a maximum of 115 cm (high position) to a minimum of 80 cm (low position). The manufacturers suggest that when a patient is unattended the bed should be left in the low position in order to reduce the possibility of patient falls and resultant injuries. According to the manual for the Advance Series beds manufactured by Hill-Rom (available on their website): “Siderails are intended to be a reminder, not a patient
restraining device.” According to Hill-Rom representatives, the siderails are meant to be a reminder for the staff. Nevertheless, according to the hospital restraint policy, bedrails act as a form of environmental restraint, meaning that they are “intended to prevent a patient’s movement from one location to another.”

Hill-Rom, along with the nurse educators at the unit, provide staff with semi-annual information/training sessions on the use of the beds. Nurses receive basic training on the proper use of hospital beds during their four year clinical nursing education but learn about the beds mostly through their clinical experiences. At the time of the fall, the bed was in a semi-raised position, the head of the bed was at 40 degrees and all siderails were up.

Staffing

No specific document exists that states how many stroke patients or other type of patient a nurse may care for. However, based on the patient intensity measurement system Acuity Plus, which is a measurement of appropriate workload used in nursing practice, the average number of staff needed to care for a typical inpatient is determined. Based on daily clinical judgements of the leadership on the unit a decision may be made to increase or decrease the number of staff based on current needs. Interviews with nursing staff indicated that, from a nursing perspective, the optimal ratio for stroke patients was 1 nurse for every 3 patients, although this ratio would vary based on the complexity of each patient. At the time of the fall, the ratio was 1 nurse for 5 patients.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

IMG_0695-smallest.jpg
IMG_0694_smaller2.jpg
IMG_0696_small.jpg
Family is encouraged by hospital staff to supervise patients or hire sitters if they are concerned for patient's safety.
- Current RN to patient ratio (1:5) is less than what nurses perceive as optimal ratio of 1:3.
- There is discrepancy between bed rail manufacturer’s view of role of bedrails as form of restraint and current practice on the unit.

Staff assessed the faller that morning and decided that faller did not need restraints on that day.
- At the time of the fall RN is too busy to check on faller every 15-20 minutes.
- Low RN to patient ratio (1:5) prevents the RN to dedicate sufficient time to each patient.
- Staff is unaware that faller is attempting to go to the washroom by herself.
- Bed rail design does not prevent the faller from leaving the bed.
- Bed manufacturer advises bedrails only as a reminder for staff, not a restraining device.
- Bedrails are used as a form of restraint.

Faller is cognitively impaired and disoriented.
- Faller is impulsive.
- Faller is on six medications.
- Faller attempts to get out of bed when not restrained.
- Faller was diagnosed with intraventricular hemorrhage on Jan 16/12.
- Faller needs assistance with every activity of daily living.
- Faller needs two people assisting with transfers and ambulation.

Faller was not restrained on that day.
- Patient never uses call bell.
- Faller has cerebral mutism and cannot call out for help.
- Faller cannot talk due to issues with tongue and excess saliva.
- Faller feels dizzy when she stands up.
- Faller has general muscle weakness.
- Faller has poor balance control and coordination problems while walking.
- The bed rails prevent faller from going back into bed.

Faller experiences a fall when she gets out of bed independently. Feb 21, 2012
- Restraints are discontinued after discussion between the healthcare team and family. Apr 24, 2012
- Faller decides to go to washroom by herself. 13:40
• Faller maneuvers herself between bed rails to get out of bed. 13:42
• Faller stands beside bed holding onto bed rails. 13:42
• Faller realizes that she is unable to go to washroom by herself. 13:42
• Faller realizes that she is unable to climb back into the bed. 13:44
• Faller loses control of her balance.
• Faller allows herself to safely slide on the floor. 13:45
Conclusions

The faller, a 54 year old female patient, fell to the ground on May 1, 2012 at 13:45. After several hours of lying in bed, the faller felt the urge to urinate and decided to use the washroom by herself, despite being instructed by her nurse to call for help. She sat herself up in bed and slowly climbed over the bed rails. She then stood by her bedside, only to realize that she was unable to walk to the washroom due to her poor balance, coordination and strength. She then decided to climb back into bed but was unable to do so. Instead she slowly lowered herself to the ground where she lay for approximately 10-15 minutes.

The faller was in a room by herself. Her husband was very supportive and visited her every day. Due to a previous fall 10 days earlier, her impulsive behavior and confusion, the faller was restrained. However, on May 1, 2012, after reassessing her, the health care team decided that she did not need to be restrained anymore. The faller was repeatedly instructed to use the call bell to call for help. However, due to swelling issues with her tongue/throat and her speech impairment, the faller never used the call bell. All four bed rails on her bed were up at the time of the fall, to prevent her from getting out of the bed. But, she was able to squeeze herself through the gap between the top and bottom siderails. Although the nurse regularly checked on her every 15 minutes, on the day of the fall the nurse was caring for 5 patients (including the faller) and was unable to attend to her within the 15 minutes. The faller was unable to communicate her urge to urinate and decided to go to the washroom by herself, unaware of her inability to stand or walk without assistance.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below.

- Due to her brain injury, surgery, medications and long length of stay, the faller was cognitively impaired, disoriented and impulsive.

- The RN was too busy to check on faller every 15-20 minutes. The RN to patient ratio at the time of the fall was 1:5 which prevented the RN from attending to each patient in a timely manner. According to nursing staff, the optimal RN to patient ratio is 1:3.

- Faller needed assistance with all activities of daily living and always required two people assisting her with transfers and ambulation. Since she was impulsive and confused she would often attempt to leave her bed or do things on her own. At the time of the fall she was unsupervised.

- 2.5 months before the investigated fall, the faller attempted to get out of bed when not restrained, which resulted in a very similar fall. On the day of the fall, she was not restrained the day of the fall because staff assessed that she did not need restraints that day.

- Although the bedrails were up (in order to prevent patients from leaving bed, according to hospital restraint policy), they failed to stop faller from climbing over and out of bed. The function of the bedrails was perceived differently by hospital staff and the manufacturer of the beds. According to the Hill-Rom (the manufacturer), the bedrails are to act only as a reminder to the staff that the patient is impulsive and tries to escape. However, according to the hospital policy and staff testimonials, the bedrails are used as a form of environmental restraint.

- Due to poor balance, coordination and general muscle weakness, the faller was unable to move once she got out of bed, and unable to climb back into bed because the bedrails are up.
In spite of regular instructions by staff on the use of the call bell, faller has never used the call bell to ask for help. Although she received regular speech therapy sessions, her verbal abilities improved slowly due to her speech impairment, excess saliva, and swelling of the tongue and throat.
Case 16272: Sequence of Events

1. Faller is a 55 year old healthy female living at home with husband and two children. 2003
2. Faller undergoes surgery for thyroidectomy. 2004
5. Faller is admitted to the hospital (emergency room) for intraventricular hemorrhage. Jan 16, 2012
7. Faller is transferred from the neurosurgical unit to the intensive care unit due to decline in health. Jan 19, 2012
9. Faller is readmitted to the neurosurgery unit. Feb 2, 2012
10. Faller starts occupational therapy. Feb 04, 2012
11. Faller starts physiotherapy. Feb 05, 2012
12. Faller experiences a fall when she gets out of bed independently. Feb 21, 2012
13. Faller is cognitively impaired and disoriented.
14. Faller is impulsive.
15. Faller is on six medications.
16. Restraints are discontinued after discussion between the healthcare team and family. Apr 24, 2012
17. Faller attempts to get out of bed when not restrained.
18. Family is encouraged by hospital staff to supervise patients or hire sitters if they are concerned for patient's safety.
19. Faller was diagnosed with intraventricular hemorrhage on Jan 16/12.
RN helps faller wash up in the morning, May 01, 2012, 9:30

Faller rests in bed, 9:30-13:40

Faller feels the urge to urinate, 13:40

Faller decides to go to washroom by herself, 13:40

Faller needs two people assisting with transfers and ambulation.

Faller was not restrained on that day.

Staff assessed the faller that morning and decided that faller did not need restraints on that day.

At the time of the fall RN is too busy to check on faller every 15-20 minutes.

Low RN to patient ratio (1:5) prevents the RN to dedicate sufficient time to each patient.

Current RN to patient ratio (1:5) is less than what nurses perceive as optimal ratio of 1:3.

Staff is unaware that faller is attempting to go to the washroom by herself.
Faller grabs bed rail to pull herself up. 13:41

Faller sits up in bed. 13:41

Faller maneuvers herself between bed rails to get out of bed. 13:42

Faller stands beside bed holding onto bed rails. 13:42

Bed rail design does not prevent the faller from leaving the bed.

Patient never uses call bell.

Faller has cerebral mutism and cannot call out for help.

Faller cannot talk due to issues with tongue and excess saliva.

Bed manufacturer advises bedrails only as a reminder for staff, not a restraining device.

Bedrails are used as a form of restraint.

There is discrepancy between bed rail manufacturer's view of role of bedrails as form of restraint and current practice on the unit.

Faller feels dizzy when she stands up.
Faller realizes that she is unable to go to washroom by herself. 13:42

- Faller has general muscle weakness.
- Faller has poor balance control and coordination problems while walking.

Faller turns to her right to get back into bed. 13:43

The bed rails prevent faller from going back into bed.

Faller realizes that she is unable to climb back into the bed. 13:44

Faller loses control of her balance.

Faller allows herself to safely slide on the floor. 13:45

Faller lies on the floor on her back. 13:45-14:00

- The cleaning staff walks by the room. 14:00
- Cleaning staff notices patient on the floor. 14:00

Faller is assisted to bed by 2 RNs. 14:02

- Faller is uninjured.

Cleaning staff calls RN. 14:00
SFIM Investigative Report

Impatient Lunch Time Transfer
Fall Information

2.1 Date of the fall: 2012-05-10

2.2 Day: Thursday

2.3 Time of fall: 24-hour clock
12:22

2.4 Witnesses: Un-witnessed

2.5 Location of the fall:
- Indoors
- Public building (includes hospitals or long term care homes)
- Hospital or LTC room

2.6 Activity at the time of the fall:
- Sitting (wheelchair)

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
- Reaching forward
- Reaching to the side
- Rising out of bed, chair, toilet, bath

2.8 Type of fall:
- Over - reach

2.9 Direction of the fall:
2.10 Environment at the fall location:

- Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

- Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

- Shoes

2.13 How did faller get up after the fall?

- Assisted by another person
  - Nurse/Other staff

  Please specify how the faller was assisted:
  - Manual lift (no aide by device)

2.14 Injury?  No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

- Yes, please specify:
  First time RN taking care of faller, first time faller attempted to transfer independently.
Information About the Faller

3.1. Demographics:

Year of birth: 1941
Gender: Male
Population (Check all that apply): Senior, Acquired brain injury, Stroke survivor

3.2 Falls history:

- Rare faller (fell only this one time in the past year)

3.4 Marital status:

- Married

3.5 Mental status:

- Confused or disoriented
- Depressed

3.6 MMSE score:

- Not available

3.7 Education:

- University partial

3.8 Mobility aids:

- Assistance by another person, All of the time
- Walker with 2 wheels, Occasionally
- Wheelchair, All of the time

3.9 Other aids used by the faller:

- Bath bench/shower seat
- Bed alarm
☑ Bed rails

☑ Raised toilet seat/Commode

☑ Seat belt in wheelchair

3.10 Medical problem at the time of the fall:

☑ Acquired brain injury ☑ Hemorrhagic

☑ Arthritis ☑ Osteoarthritis

☑ Blood pressure (high or low)

☑ Depression

☑ Diabetes (hypoglycemia)

☑ Heart conditions

☑ High Cholesterol

☑ Incontinence

☑ Muscle weakness

☑ Stroke Functional Independence Measure Score (Maximum score 126):
  ☑ Not available

Montreal Cognitive Assessment Score (Maximum score 30):
  21

Montreal Cognitive Impairment Score (MoCA < 26):
  ☑ Yes

☑ Other, please specify:
  Obstructive sleep apnea, cellulitis in right leg.

3.11 Medications:

11 Number of prescription medications used by the faller on the day of the fall

Medication Name:
Amlodipine 5mg

Medication Name:
Bezafibrate SR 400mg

Medication Name:
Bisoprol 10mg

Medication Name:
Dalteparin 5000units/.2mL

Medication Name:
Docusate Sodium 100 mg

Medication Name:
Metformin 1000mg

Medication Name:
Multivitamin

Medication Name:
Zic gluconate175mg
Medication Name:
Zinc Oxide 25% paste

Medication Name:
Lansoprazole 30mg

Medication Name:
Insuline NPH (Novolinge NPH)

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 71 year old stroke survivor fell to the ground on May 10, 2012 at 12:20. The day of the fall the faller had an occupational therapy (OT) session at 10:00 in order to complete the Montreal Cognitive Assessment (MOCA). He also participated in a physiotherapy (PT) session in the hallway of the unit at 11:15. After the session the physiotherapist sat him up in his wheelchair 50 cm away from his bed with lap tray on and call bell close by. The faller rested for 45 minutes on his wheelchair. He ate at noon while sitting on his wheelchair and then decided that he would rather lie in bed. He did not use the call bell to call for help and managed to take the wheelchair lap tray off by himself. As he tried to reach the mattress on his bed the faller’s left arm gave out causing him to lose balance and fall backward to the ground. He was able to slow his fall by holding onto the side of the bed and as a result landed without injury with his head resting underneath the bed. A nurse walking by noticed the faller lying on the ground and called for help. Three nurses rushed to the faller’s aide and assisted him to his bed. The faller was assessed for injuries by one of the nurses and no injuries were reported.

The faller
This 71 year old stroke survivor’s past medical history included Type II diabetes, dyslipidemia, hypertension, atrial fibrillation, obstructive sleep apnea (for which he was not being treated) osteoarthritis, cellulitis in his right leg and prostate cancer. He had radical prostatectomy in 2005 as well as a previous left hip replacement in 2011. The faller was active and was still working as a stock broker before his stroke. In the morning of March 12, 2012, while on his way to a funeral service, the faller experienced a sudden, very sharp and painful headache. He was brought to the emergency room by family where he was diagnosed with subarachnoid hemorrhage and subsequently transferred to the neurosurgery unit. On March 14, 2012 the faller underwent a cerebral angiogram, to evaluate the blood vessels and blockage, and embolization. On March 20, 2012 a pressure ulcer was noted on faller’s coccyx. Faller’s recovery after the surgery was slow but steady. He was not able to walk and transfer independently. His transfer status indicated assistance from 1-2 person(s), depending on the size and ability of the person providing assistance, and he also required a two-wheeled walker for walking during his hospital stay. The faller was oriented to his name, place but not date and year. As a consequence of his SAH, the faller suffered from cognitive impairment, memory loss and confusion. He also lost weight and had general muscle weakness and fatigue, which was exacerbated by his obstructive sleep apnea. He was also taking 11 different medications.

Environment
The faller was moved to a two-patient room. On the day of the fall the room was only occupied by the faller and there were no witnesses. At the time of the fall (12:20) the room was well lit by overhead lighting and a large window facing the beds. The faller was sitting in his wheelchair which rested in between the two beds. The curtains which separate the two beds were not drawn and the faller was close enough to the unoccupied bed to reach it while sitting in his wheelchair. He used the unoccupied bed to lay down his lap tray when he decided to transfer to his bed on his own. The lap tray was used as a form of restraint to discourage patients from getting out of their wheelchairs unsupervised. The faller was not wearing a chair Posey (a form of seatbelt for the wheelchair). The top right bedrails were up while the bottom right bedrails were down and all left bedrails were up. Because the bottom bedrails were down, the faller thought he could get into bed by himself without difficulty. He over-reached from his wheelchair to the mattress and lost balance.

Wound Care Management and pressure ulcer
On March 20, 2012 the faller developed a coccyx ulcer. The healthcare team in the neurosurgery unit cared for his pressure ulcer which seemed to get worse over time. On May 7, 2012 the specialized wound care management team (SWOT) was consulted and they completed an initial assessment. The ulcer was diagnosed as an unstageable pressure ulcer and SWOT prescribed a special pillow for the faller’s wheelchair which was used to help offload...
pressure on the tissue under the coccyx.

Nurse and lunch break coverage practices
On the day of the fall, the faller was a new patient for the day RN on duty. Although she had seen the faller before and assisted a colleague in caring for the faller, she had not yet been assigned as his primary nurse. At the time of the fall the nurse had gone for lunch break and a covering RN was in charge of looking after the faller. The RN did not inform the faller that she was going for lunch. During lunch time, the unit staffing levels are reduced by 40-50%. Half of the RNs go for lunch while the other half care for their own patients as well as 4-5 additional patients.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

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According to BPG for pressure ulcer care, patients should be repositioned in wheelchair every 2 hours.
- During lunch time, staff levels are reduced by 40-50%.
- Standard practice at the unit does not specify if bedrails should be raised to discourage patients from attempting to go back to bed independently.

Organizational Factors:

Faller's energy level and fatigue are not appropriately considered by staff.
- The laptray is supposed to act as a form of restraint but Faller knows how to remove it.
- Faller's RN is new to taking care of Faller, today is her first time with him.
- Faller's RN believed that Faller did not need chair posey.
- RN is on lunch break.
- Fewer RNs on duty during lunch time means less frequent checks on patients.
- Faller requires assistance from at least one person for bed to wheelchair transfers.

Preconditions:

Prolonged sitting aggravates ulcer wound on Faller's coccyx.
- Faller developed coccyx ulcer on March 20, 2012.
- Faller has Type 2 Diabetes.
- Faller's wheelchair is close enough to bed to make Faller believe that he can transfer by himself.
- Faller suffers from obstructive sleep apnea and is often tired.
- Faller has mild cognitive impairment, difficulty with short term memory and processing speed.
- Faller is on 11 prescription medications.
- Faller has difficulty communicating due to aphasia and cognitive impairment.
- Most times Faller does not adhere to staff instructions.
- Faller feels discomfort due to ulcer.
- Faller ignores the call bell.
- The upper/top bedrail is up and the lower bedrail is down.
- Faller is impulsive.
- Faller is fatigued after PT and OT sessions.
- Faller has general muscle weakness.
- Faller has lost weight recently (3kg in 5 days - May 9/12).
- Faller suffered a SAH on March 12, 2012.
- Faller did not sleep well last night due to obstructive sleep apnea.

Unsafe Acts:

- Faller sits in wheelchair after OT session. 10:30 - 11:15
- PT positions and locks Faller's wheelchair 50 cm away from the bed. 11:35
• PT instructs faller to call for help if he wants to leave the wheelchair. 11:35
• Faller sits in his wheelchair with lap tray and call bell. 11:35 - 11:55
• Faller decides to go to bed independently. 12:20
• Faller over-reaches.
• Faller reaches forward and to the side with left arm. 12:21
• Faller attempts to pull himself onto his bed. 12:21
• Faller loses control of his balance.
• Faller’s left arm gives out. 12:22
Conclusions

The faller, a 71 year old stroke survivor fell to the ground on May 10, 2012 at 12:20. The day of the fall the faller had an occupational therapy (OT) session at 10:00 in order to complete the Montreal Cognitive Assessment (MOCA). He also participated in a physiotherapy (PT) session in the hallway of the unit at 11:15. After the session the physiotherapist sat him up in his wheelchair 50 cm away from his bed with lap tray on and call bell close by. The faller rested for 45 minutes on his wheelchair. He ate at noon while sitting on his wheelchair and then decided that he would rather lie in bed. He did not use the call bell to call for help and managed to take the wheelchair lap tray off by himself. As he tried to reach the mattress on his bed the faller’s left arm gave out causing him to lose balance and fall backward to the ground. He was able to slow his fall by holding onto the side of the bed and as a result landed without injury with his head resting underneath the bed. A nurse walking by noticed the faller lying on the ground and called for help. Three nurses rushed to the faller’s aide and assisted him to his bed. The faller was assessed for injuries by one of the nurses and no injuries were reported. The faller was sitting in his wheelchair which rested between the two beds. The curtains which separate the two beds were not drawn and the faller was close enough to the unoccupied bed to reach it while sitting in his wheelchair. He used the unoccupied bed to lay down his lap tray when he decided to transfer to his bed on his own. The lap tray was used as a form of restraint to discourage patients from getting out of their wheelchairs unsupervised. The faller was not wearing a chair Posey (a form of seatbelt while in the wheelchair).

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. There are discussed below:

* On March 20, 2012 the faller developed a coccyx ulcer. The healthcare team in the neurosurgery unit cared for his pressure ulcer which seemed to get worse over time. On May 7, 2012 the specialized wound care management team (SWOT) was consulted and they completed an initial assessment. The ulcer was diagnosed as an unstageable pressure ulcer and SWOT prescribed a special pillow for the faller’s wheelchair which was used to help offload pressure on the tissue under the coccyx. However, faller felt discomfort from prolonged sitting. He had been sitting in his wheelchair since 10:00 with only a 20 minute PT session at which time he practiced walking in the hallway. According to Canadian BPGs for Risk Assessment and Prevention of Pressure Ulcers “Clients should be repositioned in the wheelchair every 2 hours.” This is also reiterated on the hospital’s website under Wound Care Management.

* Prior to the fall, the faller ate lunch, felt tired and decided that he would rather lie in bed. Canadian BPGs for stroke care require that “all patients admitted to hospital with acute stroke should be mobilized as early and as frequently as possible”. In practice, this recommendation means that the faller was left sitting in the wheelchair as opposed to lying in bed for prolonged periods of time. However, at this time faller’s energy level and fatigue were not appropriately considered by staff.

* When the OT assisted faller out of bed, the OT lowered the bottom right bedrails to allow faller to get out of bed. The bedrails were left in that position. It is common practice to leave the bedrails in the lowered position after assisting a patient out of bed. However, this might encourage patients, as in this case, to attempt to get into bed independently without supervision or assistance.

* Due to subarachnoid hemorrhage, surgery, eleven medications, and a lengthy recovery time, the faller was confused, impulsive and had difficulty with short-term memory. The faller often did not follow instructions. Staff had to repeat instructions constantly as this was the standard practice in the unit for confused patients. When left alone, the staff instructed the faller not to move independently and to use the call bell for help. However, the faller’s level of comprehension and retention of instruction was poor and when left unsupervised, he frequently attempted to transfer independently. There was no alternative practice or policy to address the inability of cognitively impaired patients to follow instructions.

* The faller needed assistance with all activities of daily living and always required assistance from at least one other person for transfers and ambulation. Because he was impulsive and confused he attempted to move on his
own and was unaware of his disability. Supervision of this patient was inadequate.
* The faller had general muscle weakness, recent weight loss, and balance problems.
* The PT returned faller back to his room after the therapy session (which took place outside faller’s room in the hallway) and left him sitting in his wheelchair. Although the wheelchair was locked, call bell was nearby and the lap tray was in place, the wheelchair was placed too close to the faller’s bed. This mislead the faller to believe that he was close enough to the bed to be able to transfer himself without assistance. The faller’s wheelchair was also close to the other (vacant) bed in the room, allowing him to easily place his lap tray on it.
* The lap tray was used as a reminder for the patient not to attempt to get up. However, the faller knew how to remove the lap tray thereby nulling its function as a form of restraint.
* The use of a chair posey (seat belt) was not deemed necessary by the faller’s RN. The faller’s RN on the day of the fall was new to this patient and therefore unfamiliar with his impulsiveness and his inability to follow instructions. Although she had seen the patient in the unit before and had previously assisted a colleague with his care, she had never been his primary RN.
* At the time of the fall the faller’s RN had gone for her lunch break. She had not informed the faller that she was going for lunch break but had informed a covering RN. During lunch time, staffing levels in the unit were reduced by 40-50%.
According to BPG for pressure ulcer care, patients should be repositioned in wheelchair every 2 hours.

Faller developed coccyx ulcer on March 20, 2012.

Faller has Type 2 Diabetes.

<table>
<thead>
<tr>
<th>Event</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faller is on his way to a friend's funeral.</td>
<td>March 12, 2012, 9:00</td>
</tr>
<tr>
<td>Faller experiences very painful and sharp headache.</td>
<td>March 12, 2012, 10:00</td>
</tr>
<tr>
<td>Faller is admitted to emergency room and is diagnosed with subarachnoid hemorrhage due to a rupture of an aneurysm in the anterior communicating artery.</td>
<td>March 12, 2012, 11:18</td>
</tr>
<tr>
<td>Faller is admitted to neurosurgery unit.</td>
<td>March 12, 2012, 16:23</td>
</tr>
<tr>
<td>Faller has cerebral angiogram surgery.</td>
<td>March 14, 2012</td>
</tr>
<tr>
<td>Faller recovers slowly and uneventfully.</td>
<td>March 16, 2012 - May 10, 2012</td>
</tr>
<tr>
<td>Faller is seen by Skin Wound Ostomy Team (SWOT) for the first time.</td>
<td>May 7, 2012</td>
</tr>
<tr>
<td>Faller has breakfast in bed.</td>
<td>May 10, 2012, 8:15</td>
</tr>
<tr>
<td>RN assists faller with a quick wash in washroom while he is sitting in his wheelchair.</td>
<td>9:30</td>
</tr>
<tr>
<td>RN transfers faller back to bed.</td>
<td>9:35</td>
</tr>
<tr>
<td>OT arrives to room to start OT session.</td>
<td>10:00</td>
</tr>
<tr>
<td>Faller transfers from lying to sitting independently.</td>
<td>10:00</td>
</tr>
<tr>
<td>OT helps faller get out of bed.</td>
<td>10:01</td>
</tr>
<tr>
<td>Faller walks with 2-wheeled walker and assistance of OT to a chair.</td>
<td>10:02 - 10:30</td>
</tr>
<tr>
<td>Faller completes Montreal Cognitive Assessment.</td>
<td>10:03 - 10:30</td>
</tr>
<tr>
<td>OT leaves.</td>
<td>10:30</td>
</tr>
<tr>
<td>Faller sits in wheelchair after OT session.</td>
<td>10:30 - 11:19</td>
</tr>
<tr>
<td>PT picks the faller up for physiotherapy session.</td>
<td>11:15</td>
</tr>
<tr>
<td>Faller has physiotherapy session in hallway.</td>
<td>11:15 - 11:35</td>
</tr>
<tr>
<td>PT brings the faller back to his room.</td>
<td>11:35</td>
</tr>
</tbody>
</table>
Faller's wheelchair is close enough to bed to make faller believe that he can transfer by himself.

Faller's energy level and fatigue are not appropriately considered by staff.

Faller suffers from obstructive sleep apnea and is often tired.

Faller's wheelchair with lap tray
The lap tray is supposed to act as a form of restraint but faller knows how to remove it.

Faller has mild cognitive impairment, difficulty with short term memory and processing speed.

Faller is on 11 prescription medications.

Faller has difficulty communicating due to aphasia and cognitive impairment.

Most times faller does not adhere to staff instructions.

Faller sits in his wheelchair with lap tray and call bell. 11:35 - 11:55
Faller's RN is new to taking care of faller, today is her first time with him.

Faller's RN believed that faller did not need chair posey.

Faller's RN comes into room to check up on faller. 11:55

PSW brings faller's lunch to his room. 12:00

Faller's RN goes for her lunch break. 12:00

Faller eats lunch on his own while sitting in his wheelchair. 12:00 - 12:20
Faller decides to go to bed independently. 12:20

- Faller feels discomfort due to ulcer.
- Faller ignores the call bell.
- RN is on lunch break.
- Fewer RNs on duty during lunch time means less frequent checks on patients.
- During lunch time, staff levels are reduced by 40-50%.

Faller takes lap tray off the w/c. 12:20

Faller puts lap tray on an empty bed on his right side. 12:20

Faller reaches forward and to the side with left arm. 12:21

- Faller over-reaches.
- The upper/top bedrail is up and the lower bedrail is down.
- Standard practice at the unit does not specify if bedrails should be raised to discourage patients from attempting to go back to bed independently.
Faller attempts to pull himself onto his bed. 12:21
Faller's left arm gives out. 12:22
Faller slowly lands on the floor. 12:22
Faller lies on floor on his back with his head under the bed. 12:22

Faller requires assistance from at least one person for bed to wheelchair transfers.
Faller is impulsive.
Faller is fatigued after PT and OT sessions.
Faller has general muscle weakness.
Faller has lost weight recently (3kg in 5 days - May 9/12).
Faller suffered a SAH on March 12, 2012.
Faller did not sleep well last night due to obstructive sleep apnea.
Faller loses control of his balance.

Covering RN passing by sees faller on floor and calls for help. 12:23
3 RNs arrive to room and lift faller onto bed and assess him for injuries. 12:24
SFIM Investigative Report

Frail and Isolated Frequent Faller
2.7 Action by the faller prior to loss of balance:

- Walking (task-oriented)

2.8 Type of fall:

- Trip

2.9 Direction of the fall:

- Forward

2.10 Environment at the fall location:

- Public building (includes hospitals or long term care homes)
- Hospital or LTC room
2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

Faller had started using new, hospital walker 3 days ago.

☐ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☐ Walker without wheels

2.12 Footwear worn by the faller at the time of the fall:

☐ Shoes

2.13 How did faller get up after the fall?

☐ Assisted by another person

☐ Nurse/Other staff

Please specify how the faller was assisted:

☐ Manual lift (no aide by device)

2.14 Injury?  ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

Faller had started using new, hospital walker 3 days ago.
3.1. Demographics:

Year of birth: 1946
Gender: Male
Population (Check all that apply):
- Acquired brain injury
- Cognitive impairment (Check only if permanent)
- Stroke survivor
Age Calculated: 66

3.2 Falls history:
- Multiple faller (falls regularly)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency
   - Number of falls in the last week: 1
   - Number of falls in the last month: 3
   - Number of falls in the last year: 3

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):
- Unknown

3.4 Marital status:
- Divorced

3.5 Mental status:
- Agitated/aggressive/combative
- Isolated
- Confused or disoriented
- Depressed

3.6 MMSE score:
- Not available

3.7 Education:
- Unknown
3.8 Mobility aids:

☑ Assistance by another person ☐ All of the time
☑ Walker without wheels ☐ All of the time
☑ Wheelchair ☐ Occasionally

3.9 Other aids used by the faller:

☑ Bath bench/shower seat
☑ Bathroom grab bar
☑ Bed rails
☑ Glasses ☑ for distance

3.10 Medical problem at the time of the fall:

☑ Acquired brain injury ☐ Anoxic
☑ Blood pressure (high or low)
☑ Deconditioning
☑ Depression
☑ High Cholesterol
☑ Muscle weakness
☑ Pulmonary Disease
☑ Stroke ☑ Functional Independence Measure Score (Maximum score 126):
  ☑ Not available
  ☐ Montreal Cognitive Assessment Score (Maximum score 30):
    25
  ☐ Montreal Cognitive Impairment Score (MoCA < 26):
    ☑ Yes

☑ Other, please specify:
Confusion, swallowing, balance loss, coordination.

3.11 Medications:

7 __ Number of prescription medications used by the faller on the day of the fall

Medication Name:
Acetylsalicylic acid EC 81 mg

Medication Name:
Lodipine 5 mg PO daily

Medication Name:
Atorvastatin 20 mg daily

Medication Name:
Cyanocobalamin SR 1,200 mcg PO
Medication Name:
Docusate Sodium 100 mg PO BID

Medication Name:
Enoxaparin 40 mg 10.4 mL 8c

Medication Name:
Ramipril 10 mg PO daily

____ Number of over-the-counter medications used by the faller on the day of the fall
Investigative Report Summary

The faller, a 66 year old stroke survivor fell in an acute care hospital room on Thursday, May 17, 2012 at approximately 15:55. After an afternoon physiotherapy session, the faller was assisted to the washroom in his hospital room by the physiotherapist (PT). The faller was able to walk with his walker but required assistance and supervision by at least one other person. The faller left his walker just outside the washroom door and before leaving him the PT reminded the faller to call his RN using the call bell in the washroom when he was ready to leave. The faller used the call bell to call for help but after 5 minutes of waiting became impatient and decided to go to his bed independently. He stepped out of the washroom and grabbed onto his walker. As he started walking his foot hit the walker and he tripped over the walker. He lost balance and fell forward to the ground. The RN walked into his room and noticed the faller on the floor. She rushed to the room doorway and called for assistance from other nurses nearby. Two other RNs arrived and helped the faller into his bed. Fallers were assessed for injuries and no injuries were found.

The faller
This 66 year old gentleman experienced his first stroke in 2008. At the time he lived alone and had not seen a doctor in many years. He did not seek medical treatment for this stroke and self-diagnosed himself. After this event, the faller’s health started to decline. He was experiencing 2-3 falls per week and in 2010 he noticed the onset of slurring of words. He began to use a walker, which was given to him by a friend, inconsistently as he was becoming increasingly weak due to significant muscle wasting. His diet at this time consisted mainly of chocolate bars. The faller was a chain smoker and heavy drinker. His mobility around the apartment began to decline to the point of spending the majority of his days sitting in an armchair watching television. Due to his decreased mobility the faller used empty jars to urinate in and these jars rested around his armchair within arm’s reach. On May 13, 2012, the faller felt very weak and uncoordinated in his movements, and he fell three times. The first fall occurred when he lost his balance and landed on the armchair. He was unable to pick himself up and his landlord had to help him back up. The second time he missed his chair and landed in a seated position on the floor. He sat there for several hours before his landlord saw him and helped him back up. During the third fall the faller fell to the ground while trying to reach the telephone, he was unable to pick himself up and lay there for seven hours before his landlord came by to check up on him again. His landlord called an ambulance and the faller was taken to the emergency room. The faller was diagnosed with right caudate putamen stroke. On May 14, 2012, the faller was transferred to the neurology unit where he stayed until May 30, 2012 at which time he was discharged to a stroke rehabilitation hospital. During his stay at the acute care hospital the faller’s recovery progressed slowly due to his lack of motivation to participate in therapies. The faller had pronounced speech impairments and communicated with great difficulty. His speech was slurred and difficult to understand. The faller was also inappropriate in his speech, often times cursing and using vulgar language that easily offended others. Although he did not physically harass members of the health care team, his inappropriate language made him an unpleasant patient. The faller had been suffering from depression for many years and it was believed that his depression was linked to personal and family issues.

Family
The faller was divorced and estranged from his children. He did not have any friends or family other than his landlord who periodically checked up on him and occasionally assisted with groceries. The basement apartment that he lived in was owned by the landlord who lived upstairs. After his second stroke in May 2012, the faller’s daughter started to visit her father and became more involved with his care. After his discharge from the rehabilitation hospital the faller’s daughter visited faller once or twice a week to assist with groceries.

Environment
At the time of the fall the faller was walking from the washroom of his hospital room to his bed. The room was occupied by the faller and one other patient. The curtains around the faller’s bed were drawn to separate the faller’s space from his roommate’s. The washroom was shared by the faller and his roommate. His roommate was...
not in the room at the time of the fall. The faller’s bed was closest to the washroom, approximately 6 meters away. The room was lit by overhead lighting and a large window closest to the faller’s roommate's bed. The room environment was kept in good condition.

Walker
The faller used a four wheeled walker at home. This walker was given to him by a friend but it is unclear where it was acquired from. He did not use this walker frequently as it was large and difficult to maneuver around his home. When he arrived at the stroke unit at the acute care hospital, the faller was assessed for and given a generic walker by the OT. This walker did not have wheels and belonged to the hospital. The faller received this walker 3 days before his fall and was still adjusting to it.

CCAC
The Community Care Access Centre (CCAC) was not involved with the faller’s care before his second stroke. Because he never visited a hospital or doctor no one was made aware of the faller’s declining health and living conditions. His landlord acted as his only informal support and was only able to provide the faller with minimal assistance.

Right caudate putamen stroke
According to a study published in the Journal of Neuroscience, a stroke in the right caudate putamen can affect many types of motor skills including: controlling motor learning, motor performance and tasks, motor preparation, specifying amplitudes of movement and movement sequences. This form of stroke can also affect reinforcement and implicit learning. Reinforcement learning is necessary for interacting with the environment and catering actions to maximize the outcome. Implicit learning is a passive process where people are exposed to information and acquire knowledge through exposure. Stroke affecting the putamen has also been shown to impair performance of rule-based tasks (Sapir, A., Kaplan, J.B., He, B., & Corbetta, M., 2007). The faller suffered a right caudate putamen stroke and consequently suffered from motor deficits similar to the ones described above.

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Swiss Cheese Report

Organizational Factors:
- Faller does not have a formal support network.

Supervision:
- Faller does not have a family doctor.
- Faller does not have consistent medical follow up.
- Faller has minimal assistance with grocery purchase and no assistance with meal preparations.
- Faller does not have an informal support network.
- Faller requires supervision when using the toilet.
- RN is assisting another patient.
- RN is very busy caring for 5 other patients and can't assist faller immediately.
- Faller requires one person assistance for all transfers.
- Staff perceive the faller as a difficult patient due to his inappropriate behaviour.

Preconditions:
- Faller is isolated.
- Faller has significant muscle wasting.
- Faller is malnourished.
- Faller has poor diet, which consists mainly of chocolate bars and cigarettes.
- Faller is unable to pick himself up.
- Faller is frail.
- Faller's recovery is slow.
- Faller lacks motivation to participate in activities of daily living.
- Faller is depressed.
- Faller is on seven medications.
- Faller has difficulty communicating due to aphasia.
- Faller perceives that he has been waiting for longer than 5 minutes for assistance.
- Call bell call is unanswered.
- Faller is confused.
- Faller is impulsive.
- Faller has impaired learning due to stroke.
- Faller speaks inappropriately and often swears at staff.
- Faller was unfamiliar with the walker given to him in the hospital 3 days before.
- Although the faller was shown how to use the walker by PT he is still adjusting to it.
- Faller is unstable and has difficulty controlling limb movements.
- Faller suffered a right caudate putamen stroke.
- Faller's legs often give out.
- Fall has poor coordination.

Unsafe Acts:
- Faller loses balance regularly after his initial stroke. 2008 - 2010
- Faller starts inconsistently using a walker given to him by a friend. 2010
- Faller lies on floor for seven hours after the third fall. May 13, 2012
• Faller rests in bed for most of day. May 17, 2012
• PT instructs faller to use call bell to call for assistance when he is done. 15:44
• Faller waits 5 minutes for RN to arrive. 15:49 - 15:54
• Faller decides to leave washroom without help. 15:54
• Faller’s right foot hits walker. 15:55
• Faller trips over the walker. 15:55
• Faller loses balance. 15:55
Conclusions

The faller, a 66 year old stroke survivor fell in an acute care hospital room on Thursday, May 17, 2012 at approximately 15:55. After an afternoon physiotherapy session, the faller was assisted to the washroom in his hospital room by the physiotherapist (PT). The faller was able to walk with his walker but required assistance and supervision by at least one other person. The faller left his walker just outside the washroom door and before leaving him the PT reminded the faller to call his RN using the call bell in the washroom when he was ready to leave. The faller used the call bell to call for help but after 5 minutes of waiting became impatient and decided to go to his bed independently. He stepped out of the washroom and grabbed onto his walker. As he started walking his foot hit the walker and he tripped over the walker. He lost balance and fell forward to the ground. The RN walked into his room and noticed the faller on the floor. She rushed to the room doorway and called for assistance from other nurses nearby. Two other RNs arrived and helped the faller into his bed. Fallers were assessed for injuries and no injuries were found.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* Due to a stroke affecting the right caudate putamen region, the faller had difficulty executing and learning limb movements and motor tasks. Three days before the fall, he was given a walker that he was unfamiliar with and had difficulty walking with it.
* The faller needed assistance with most activities of daily living and always required assistance and supervision from at least one other person with transfers and ambulation. Because he was impulsive and impatient the faller attempted to leave the washroom to head back to his bed by himself instead of waiting for assistance from his RN. He was a difficult patient who used inappropriate language with staff. He was impatient and perceived that he waited for the RN to assist him from the washroom longer than 5 minutes.
* The faller had significant muscle weakness and wasting, as well as poor balance. He was unsteady on his feet, uncoordinated in walking movements and his legs often gave out. He was confused and frail and often did not follow instructions. He suffered from depression and was not at all motivated to get better or participate in therapies.
* Before his second stroke, which brought him to the hospital, the faller lived alone in a basement apartment owned by a friend. He lacked any kind of formal support and his only source of informal caregiving was the friend who owned the apartment. The landlord lived in the apartment above the faller and periodically visited the faller to help with grocery shopping.
* In 2008 the faller suffered what he self-diagnosed as a stroke. He never sought medical attention for this incident. He did not have a family physician and had not seen a doctor in many years. Soon after this event his health began to decline. His mobility around the apartment began to decrease to the point of spending most of his days on an armchair watching television. His general muscle weakness and wasting compounded the problem further. The faller suffered from depression and became increasingly isolated. He was malnourished as his diet consisted of chocolate bars and cigarettes. He lacked the will to live and thrive and this was evident in his living conditions. He used empty jars to urinate into and placed them around his armchair.
* The faller was divorced and estranged from his children due to his alcoholism. It was at this time that faller became depressed. Although his only source of assistance and caregiving came from his landlord, the landlord was not knowledgeable in community care resources that were available. He was not sure what to do for the faller and therefore continued to provide him with minimal assistance when his time permitted.
* Although the PT brought the faller back to his room and assisted him to the washroom, she was unable to wait for faller and assist him back to his bed due to time constraints. The PT informed the RN that the faller was in the washroom. The faller was left unsupervised during the time he used the washroom, even though staff were aware that the faller was impulsive.
* Because the RN was caring for 5 other patients that day, she was busy and unable to assist the faller immediately. However, she did answer his call bell call within 5 minutes, which is standard practice at the unit.
Faller has minimal assistance with grocery purchase and no assistance with meal preparations.

Faller does not have a formal support network.

Faller's landlord finds Faller on the floor. May 13, 2012

Faller's landlord takes Faller to the ER. May 14, 2012

Faller is diagnosed with right caudate putamen stroke. May 14, 2012

Faller is admitted to stroke unit. May 14, 2012
Front of washroom door. RN is very busy caring for 5 other patients and can't assist faller immediately. Faller perceives that he has been waiting for longer than 5 minutes for assistance. Call bell call is unanswered. Faller decides to leave washroom without help. 15:54

Faller rests in bed for most of day, May 17, 2012. Faller's recovery is slow. Faller lacks motivation to participate in activities of daily living. Faller is depressed. Faller is on seven medications. Faller has difficulty communicating due to aphasia. PT instructs faller to use call bell to call for assistance when he is done. 15:44 Faller requires supervision when using the toilet. Faller attends PT session. May 17, 2012, 15:15-15:40 PT escorts faller to the washroom at the end of his therapy session. 15:41 Faller waits 5 minutes for RN to arrive. 15:49 - 15:54 RN is assisting another patient. RN is very busy caring for 5 other patients and can't assist faller immediately. Faller perceives that he has been waiting for longer than 5 minutes for assistance. Call bell call is unanswered. Faller is confused. Faller is impulsive. Faller has impaired learning due to stroke. Faller requires one person assistance for all transfers. Faller speaks inappropriately and often swears at staff.
Faller grabs onto walker. 15:54
Faller walks forward. 15:54
Faller’s right foot hits walker. 15:55
Faller trips over the walker. 15:55
Faller was unfamiliar with the walker given to him in the hospital 3 days before.
Faller is unstable and has difficulty controlling limb movements.
Although the faller was shown how to use the walker by PT, he is still adjusting to it.
Faller suffered a right caudate putamen stroke.
Faller loses balance. 15:55
Faller falls forward onto floor of washroom. 15:55
RN arrives at room and finds faller on floor. 15:56
RN rushes to hallway to call for help. 15:56
Faller’s legs often give out.
Faller has poor coordination.
Two RNs assist faller back to his bed and assess him for injuries. 15:57
SFIM Investigative Report
Hanging by Restraints, Trying to Escape
2.6a Was this person multi-tasking?  Yes

2.7 Action by the faller prior to loss of balance:

- Laying
- Reaching to the side
- Rising out of bed, chair, toilet, bath
- Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:

- Slide against a wall or an object

2.9 Direction of the fall:
2.10 Environment at the fall location:

- Bed railing
- Equipment failure contributed to the fall

2.11 Mobility aid used at the time of the fall:

- None

2.12 Footwear worn by the faller at the time of the fall:

- Socks only

2.13 How did faller get up after the fall?

- Assisted by another person
  - Nurse/Other staff

  Please specify how the faller was assisted:
  - Manual lift (no aide by device)

2.14 Injury?  Yes

2.15 Injury severity:

- Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

- Abrasion/scrape

2.17 Injury location:
2.18 Type of medical attention received:

☑ Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

1. Fire alarm went off and faller was an emergency responder; 2. New RN looking after him.
3.1. Demographics:

Year of birth: 1958 Age Calculated: 54
Gender: Male
Population (Check all that apply): ☑ Acquired brain injury
☑ Stroke survivor

3.2 Falls history:
☑ Rare faller (fell only this one time in the past year)

3.4 Marital status:
☑ Married

3.5 Mental status:
☑ Agitated/aggressive/combative
☑ Confused or disoriented

3.6 MMSE score:
☑ Not available

3.7 Education:
☑ College or equivalent completed

3.8 Mobility aids:

☑ Wheelchair ☑ All of the time

3.9 Other aids used by the faller:

☑ Bath bench/shower seat
☑ Bathroom grab bar
☑ Bed rails
☑ Glasses ☑ for distance

☑ Raised toilet seat/Commode
Seat belt in wheelchair
Shower chair

3.10 Medical problem at the time of the fall:

- Muscle weakness
- Pain
- Recovering from surgery
- Stroke

- Functional Independence Measure Score (Maximum score 126):
  - Not available
- Montreal Cognitive Assessment Score (Maximum score 30):
  - 0
- Montreal Cognitive Impairment Score (MoCA < 26):
  - Not available

Other, please specify:
multiple sclerosis

3.11 Medications:

9 Number of prescription medications used by the faller on the day of the fall

- Dalteparin 5000 unit/0.2mL
- Docusate Sodium 100mg
- Interferon 44 mg
- Citalopram 10mg
- Perindopril 8mg
- Raintidine 150mg
- Metoprolol 25mg
- Tylenol 650mg
- Acetaminophen 325-650mg

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 53 year-old stroke survivor fell on Thursday, May 31, 2012 at approximately 6:32. Prior to this fall, the faller experienced two other falls while at acute care hospital. The previous falls were the result of the faller’s attempts to transfer to the washroom independently during the middle of the night, on May 29th and 30th. During the night of May 31st, the faller was feeling very restless, confused and agitated. He was unable to sleep and tossed and turned for the majority of the night. The RN placed wrist restraints on the faller to prevent him from pulling out tubes or wires. At 2:00 the faller decided to get out of bed by himself without calling for help. Although the bedrails were up and the faller’s wrists were restrained he was able to sit himself up and put his right leg underneath the bottom bedrail. The RN walked in for a scheduled check and when she noticed the faller attempting to once again get out of bed, she repositioned him and placed a Pinel system waist restraint with the “beavertail” attachment on him and removed the wrist restraints. The faller was still unable to sleep and lay in bed awake from approximately 2:10-6:30. At 6:30 the hospital fire alarm went off and since the faller was trained as a first responder/firefighter, he naturally felt the urge to respond to the alarm. The faller pulled and twisted the restraint straps and somehow repositioned himself so that his head was at the foot of the bed. Next, the faller squeezed himself in between the bedrails, through the space between the top and bottom bedrails, while he was still restrained, and fell off the side of the bed. Two RNs heard the commotion and the faller yelling for help and rushed to his room. The RNs found the faller hanging at the side of the bed, face up, with the “beavertail” restraint still around his waist. The RNs struggled to free the faller but were unable to do so because the weight of the faller pulled down on the restraints and caused the magnetic lock to jam (refer to picture). Six other RNs in the unit rushed into room. Together they were able to snap open the waist restraint by cutting it with scissors and gently lower the faller to the ground. The faller was lifted back into bed and assessed for injuries but no major injuries were found. The faller sustained a minor abrasion on his right hip.

Faller
The faller was a 53 year old right-handed gentleman who had a sudden onset of hemiplegia on May 19, 2012. The faller was in the shower when he noticed that his left hand and later his left leg stopped working. He was taken to the emergency room of a local hospital in a smaller town and later transferred to the regional acute care hospital for further evaluation. The faller was diagnosed with an intraparenchymal hemorrhage in his premotor gyrus with edema surrounding it. The faller was previously diagnosed with multiple sclerosis in 2008 and suffered from degenerative disc disease and carpal tunnel syndrome. During his stay in the acute care hospital, the faller was alert and oriented during the day, but confused and restless at night. He had an eye deviation to the right with inability to look to the left. He had a left facial weakness and dense left hemiplegia and significant left sided neglect.

Family
The faller’s wife was a registered nurse and worked both in their small hometown hospital as well as in the regional acute care hospital. She was very supportive and visited her husband every day after work. The faller also had extended family in the city, who visited often.

The faller’s wife expressed dissatisfaction with the use of restraints on her husband. According to the hospital restraint policy: “A patient may be restrained or confined or a monitoring device (as a restraint) or a safety and protective device used ONLY if the use of restraint or confining or monitoring is authorized by a plan of treatment to which the patient or substitute decider has consented.” However, the faller’s wife stated that she was not consented for the use of the Pinel waist restraint on her husband the evening of the fall. Hospital staff stated that attempts were made to contact the faller’s wife, but they were unable to reach her in the middle of the night when there was an increased risk to his safety due to agitation, impulsivity and restlessness. According to hospital policy, in emergency situations the consent of the patient or substitute decision maker is not needed to restrain a patient, however, it is unclear if the night of the fall was deemed an emergency scenario.

Restraints
The faller was not restrained after his first fall because before the first fall, the faller’s wife did not give consent for
the use of restraints. The faller was restrained after his second fall as this was assessed to be an emergency situation. She later expressed that she was not content with the use of restraints and would rather monitor the faller herself or ask a relative to monitor him. She was made aware of the need for restraints after the night of the third fall when hospital staff informed her of the fall and the use of restraints. She was upset and said that she was not made aware of the need to restrain her husband using the waist restraint and that no one discussed the use of restraints with her. Hospital staff stated that because it was an emergency situation and because they were unable to reach her by telephone (it was late at night), they restrained the faller without her consent.

The night of the third fall, investigated here, the faller was placed on the Pinel Beavertail Restraint by an RN. The Pinel restraint system is a lock and key belt that is used for the positioning of restless or combative patients. The system consists of cloth covered straps that latch together by means of a magnetic key. The waist strap is the biggest and most widely used portion of this restraint system. Other parts include shoulder, thigh, wrist, ankle and head straps. Only the waist strap was used on the faller. The restraint system comes with lengthy instructions on proper use. The manufacturer of the Pinel restraint system does not recommend the use of this system when parted bedrails are used, unless a solid gap protector is inserted to prevent patients from slipping through the gap. “Using bed rails with the Pinel Waist Belt is redundant; however for reasons of perceived security some staff will place the rails in the up position. If these are split rails (of sufficient spread between rails to tempt a patient’s escape), it is recommended that the Gap Cover be used to close this gap. It is an inexpensive means of blocking this gap and prevent a patient from trying to slide between the rails” (Pinel restraining and de-restraining instruction booklet, page 24).

Other recommendations made by the manufacturer and Health Canada for the proper use of the Pinel waist restraint systems include the continuous monitoring of restless, agitated or aggressive patients. Also, according to both manufacturers and Health Canada, the diagonal restraint (one hand and opposing foot restraint) should be used to prevent accidents in cases where constant monitoring is not available.

Nursing
The faller had not previously been in the care of the night nurse who was taking care of him the night of the fall. She was unfamiliar with his impulsive behaviour, and previous occupation as a first responder, as this information was not clearly discussed during RN verbal reporting during shift change, the night of the fall.

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Swiss Cheese Report

Organizational Factors:

- Restraints were the only falls prevention strategy implemented for this frequent faller at high risk.
- Pinel manufacturer and Health Canada both state that the waist restraint system should not be used with parted bedrails unless a gap protector is used.
- Pinel manufacturer and Health Canada both recommend that a diagonal restraint (one hand and opposing foot) should be used when patients can’t be monitored continuously.
- Unit staff rarely use a gap protector and diagonal restraints due to the additional time needed for their set-up and installation.
- According to hospital policy, staff are required to obtain consent from substitute decision maker before the application of restraints.

Supervision:

- Monitoring strategies were discussed with faller’s wife (in lieu of restraints) but were never implemented.
- Staff is unaware of faller’s actions.
- Faller’s wife was not consulted prior to application of restraints to the faller.
- During shift change verbal reporting, RN #3 was not informed of faller’s anxiety, impulsive behavior and previous occupation.

Preconditions:

- Faller is disoriented to time and place.
- Faller is at high risk for falls (Morse Fall Score > 51).
- Faller was diagnosed with Multiple Sclerosis (MS) in 2008.
- MS causes faller to experience transient sensory deficits including lapses in motor control.
- Faller suffered an intraparenchymal hemorrhage 11 days ago.
- Faller has poor trunk control.
- Faller is hemiplegic on left side.
- Faller had complained of pain in lower back and hip earlier in the day.
- Faller is extremely impulsive.
- Faller is restless.
- Faller is agitated due to medications and cognitive state.
- Faller does not adhere to staff instructions.
- Due to confusion and disorientation the faller does not have insight into purpose of bedrail.
- Faller’s anxiety level peaks.
- Faller is preconditioned to respond to an emergency alarm.
- Faller used to work as a fire fighter.
- It is the first time RN #3 is taking care of faller.
- Restraints are ineffective.
- The waist Pinel beavertail was not tight enough to prevent faller from twisting it.
- The space between the bedrails (approximately 30 cm) allows faller to get out of bed.
- A solid gap protector was not used to prevent faller from slipping in between bedrail gap.
- Faller is on 9 prescription medications.
- Faller is confused.
- Faller has muscle weakness.

Unsafe Acts:

- Faller experiences first fall at acute care hospital while trying to go to the washroom by himself. May 29, 2012, 2:30
- Faller experiences second fall while attempting to get out of bed. May 30, 2012, 00:45
- Faller loses control of his trunk. 23:54
- Faller topples over towards his right side. 23:55
- Faller tries to get out of bed independently. 2:00
- Faller puts his right leg underneath the bottom bedrail. 2:01
- RN #3 places the Pinel system waist restraint with beavertail attachment on faller. 2:05
- The hospital fire alarm goes off. 6:30
- Faller repositions himself with his head at the foot of the bed.
- Faller squeezes between the bedrails while he is restrained. 6:31
- Faller loses control of his balance.
- Faller falls off the side of the bed.
Conclusions

The faller, a 53 year-old stroke survivor fell on Thursday, May 31, 2012 at approximately 6:32. Prior to this fall, the faller experienced two other falls while at acute care hospital. The previous falls were the result of the faller’s attempts to transfer to the washroom independently during the middle of the night, on May 29th and 30th. During the night of May 31st, the faller was feeling very restless, confused and agitated. He was unable to sleep and tossed and turned for the majority of the night. The RN placed wrist restraints on the faller to prevent him from pulling out tubes or wires. At 2:00 the faller decided to get out of bed by himself without calling for help. Although the bedrails were up and the faller’s wrists were restrained he was able to sit himself up and put his right leg underneath the bottom bedrail. The RN walked in for a scheduled check and when she noticed the faller attempting to once again get out of bed, she repositioned him and placed a Pinel system waist restraint with the “beavertail” attachment on him and removed the wrist restraints. The faller was still unable to sleep and lay in bed awake from approximately 2:10-6:30. At 6:30 the hospital fire alarm went off and since the faller was trained as a first responder/firefighter, he naturally felt the urge to respond to the alarm. The faller pulled and twisted the restraint straps and somehow repositioned himself so that his head was at the foot of the bed. Next, the faller squeezed himself in between the bedrails, through the space between the top and bottom bedrails, while he was still restrained, and fell off the side of the bed. Two RNs heard the commotion and the faller yelling for help and rushed to his room. The RNs found the faller hanging at the side of the bed, face up, with the “beavertail” restraint still around his waist. The RNs struggled to free the faller but were unable to do so because the weight of the faller pulled down on the restraints and caused the magnetic lock to jam (refer to picture). Six other RNs in the unit rushed into room. Together they were able to snap open the waist restraint by cutting it with scissors and gently lower the faller to the ground. The faller was lifted back into bed and assessed for injuries but no major injuries were found. The faller sustained a minor abrasion on his right hip.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accidental Causation. These are discussed below:

* The faller was disoriented and confused at night and was at a high risk for falls. He recently had a stroke and was previously diagnosed with MS which caused him to experience transient sensory difficulties including lapses in motor control, confusion and jumbled thoughts. He also did not have truck control and was hemiplegic on his left side. The faller was extremely impulsive and during the night he was restless and agitated. He had previously complained of lower back and hip pain. The faller used to work as a first responder/firefighter and was conditioned to respond to emergency alarms. When the hospital fire alarm went off he automatically felt the urge to get up and go.

* Information about the faller’s impulsive behaviour, anxiety and past occupation was not communicated to the nurse taking care of him the night of the fall. There was a lack of communication between the day shift RN and the night shift RN during regular verbal reporting at shift change. This was the first time the night shift RN was taking care of the faller and she was not familiar with him.

* Although the faller experienced 2 falls in the last two nights, restraining was the only falls prevention strategy implemented after the second fall. The faller’s wife was not in agreement with the use of restraints and did not consent to the use of restraints on her husband after his first fall. She preferred to either monitor him herself or have a family member monitor him instead of using restraints. However, on the night of the third fall, need for restraints was not discussed with her because the faller’s impulsive and restless behaviour started late in the night when it was difficult to contact her.

* The waist Pinel restraint with “beavertail” attachment was not tight enough to prevent the faller from twisting it and repositioning himself (ie. helicoptering in the bed). The night RN (RN #3) was familiar with this restraint system and believed that she had fastened the restraint tight enough to restrain patient and also allow him to be comfortable.

* A solid gap protector was not used to prevent the faller from slipping in between bedrail gap. Staff stated that, “we do have a couple of sets of gap protectors but generally they are not used as they are bulky and must be
removed to allow the bed rail to be lowered”. Because the installation and removal of the gap protectors required additional time, it increased the workload for staff and hence gap protectors were rarely used in the unit.

* Pinel manufacturer and Health Canada state that this restraint system should not be used with parted bedrails unless a gap protector is used.

* The recommendation made by the manufacturer and Health Canada for the use of a diagonal restraint (one wrist and opposing ankle restraint) was also not followed due to time constraints.

* Although both of these recommendations were communicated to staff through information sessions by the manufacturer or learning sessions organized by the unit management team, standard practice was to avoid the use of the gap protectors and diagonal restraints because heavy nursing workload.
Faller notices he is unable to move his left hand while taking shower at home. May 19, 2012

Faller is diagnosed with intraparenchymal hemorrhage. May 19, 2012

Faller experiences first fall at acute care hospital while trying to go to the washroom by himself. May 29, 2012, 2:30

Faller is oriented to time and place.

Faller is at high risk for falls (Morse Fall Score > 51).

Faller has the urge to urinate. May 30, 23:50

Faller attempts to use bed pan with right hand. 23:54

Faller loses control of his trunk. 23:54

Faller was diagnosed with Multiple Sclerosis (MS) in 2008.

MS causes faller to experience transient sensory deficits including lapses in motor control.

Faller suffered an intraparenchymal hemorrhage 11 days ago.
Faller topples over towards his right side. 23:55

Faller has poor trunk control.

Faller is hemiplegic on left side.

Faller had complained of pain in lower back and hip earlier in the day.

RN #3 catches the faller. 23:55

RN #3 tells the faller "you can't do this on your own." 23:55

RN #3 assists faller to use bed pan. 23:55

RN #3 raises both bed rails and places wrist restraints on faller. 23:56

Faller tosses and turns in his bed. May 31, 2012, 00:00 - 2:00

Faller tries to get out of bed independently. 2:00

Faller puts his right leg underneath the bottom bedrail. 2:01

Faller is extremely impulsive.

Faller is restless.

Faller is agitated due to medications and cognitive state.

Faller does not adhere to staff instructions.

Staff is unaware of faller's actions.

Due to confusion and disorientation the faller does not have insight into purpose of bedrail.
Case 16960: Sequence of Events

Consent from substitute decision maker before the application of restraints.

Faller lives in bed awake.

RN #3 places the Pinel system waist restraint with beavertail attachment on faller. 2:05

Faller lies in bed awake. 2:10-6:30

Pinel manufacturer and Health Canada both state that the waist restraint system should not be used with parted bedrails unless a gap protector is used.

Pinel manufacturer and Health Canada both recommend that a diagonal restraint (one hand and opposing foot) should be used when patients can't be monitored continuously.

Unit staff rarely use a gap protector and diagonal restraints due to the additional time needed for their set-up and installation.

Faller's wife was not consulted prior to application of restraints to the faller.

According to hospital policy, staff are required to obtain consent from substitute decision maker before the application of restraints.
Faller squeezes between the bedrails (approximately 30 cm) allows faller to lose control of his balance. 6:30

Faller’s anxiety level peaks.

Faller is preconditioned to respond to an emergency alarm.

Faller is on 9 prescription medications.

It is the first time RN #3 is taking care of faller.

The space between the bedrails (approximately 30 cm) allows faller to get out of bed.

A solid gap protector was not used to prevent faller from slipping in between bedrail gap.

Faller is confused.

During shift change verbal reporting, RN #3 was not informed of faller’s anxiety, impulsive behavior and previous occupation.

Faller is moved to the bed and assessed for injuries.

Faller is lifted back into his bed and assessed for injuries.

Faller sustains minor abrasion on right hip.

Faller repositions himself with his head at the foot of the bed. 6:31

Restraints are ineffective.

The waist Pinel beavertail was not tight enough to prevent faller from twisting it.

A solid gap protector was not used to prevent faller from slipping in between bedrail gap.

Faller is on 9 prescription medications.

It is the first time RN #3 is taking care of faller.

The hospital fire alarm goes off. 6:30

Faller pulls and twists the restraint straps. 6:30

Faller repositions himself with his head at the foot of the bed. 6:31

Restraints are ineffective.

The space between the bedrails (approximately 30 cm) allows faller to get out of bed.

A solid gap protector was not used to prevent faller from slipping in between bedrail gap.

Faller is confused.

During shift change verbal reporting, RN #3 was not informed of faller’s anxiety, impulsive behavior and previous occupation.

Faller is moved to the bed and assessed for injuries.

Faller is lifted back into his bed and assessed for injuries.

Faller sustains minor abrasion on right hip.

Faller is moved to the bed and assessed for injuries.

Faller is lifted back into his bed and assessed for injuries.

Faller sustains minor abrasion on right hip.
SFIM Investigative Report

Night Walker
SFIM
Case ID: 1200612       Date: 2013-06-06       Subject #: 16961

Fall Information

2.1 Date of the fall: 2012-06-20
2.2 Day: Wednesday

2.3 Time of fall: 24-hour clock
3:30

2.4 Witnesses: Un-witnessed

2.5 Location of the fall:
- Indoors
- Public building (includes hospitals or long term care homes)
- Hospital or LTC room

2.6 Activity at the time of the fall:
- Standing on both feet

2.6a Was this person multi-tasking? Yes

2.7 Action by the faller prior to loss of balance:
- Walking (task-oriented)

2.8 Type of fall:
- Slide against a wall or an object

2.9 Direction of the fall:
2.10 Environment at the fall location:

- Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

- None

2.12 Footwear worn by the faller at the time of the fall:

- Socks only

2.13 How did faller get up after the fall?

- Assisted by another person
  - Nurse/Other staff

  Please specify how the faller was assisted:
  - Manual lift (no aide by device)

2.14 Injury?  

- No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

- Yes, please specify:
  Feeding tube was inserted into faller the day before the fall. Faller got up and out of bed independently for the first time.
3.1. Demographics:

Year of birth: 1928  
Age Calculated: 84

Gender: Male

Population (Check all that apply):
- Senior  
- Acquired brain injury  
- Stroke survivor

3.2 Falls history:

- Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Number of falls in the last week: 0
Number of falls in the last month: 0
Number of falls in the last year: 1

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

- Unknown

3.4 Marital status:

- Widowed

3.5 Mental status:

- Confused or disoriented
- Depressed

3.6 MMSE score:

- Not available

3.7 Education:

- Primary school partial
3.8 Mobility aids:

- ✔ Walker without wheels
- ✔ Walker with 4 wheels for indoor or outdoor use (rollator)

Walker without wheels was used in hospital.

3.9 Other aids used by the faller:

- ✔ Bathroom grab bar
- ✔ Bed rails

3.10 Medical problem at the time of the fall:

- ✔ Blood pressure (high or low)
- ✔ Depression
- ✔ Diabetes (hypoglycemia)
- ✔ High Cholesterol
- ✔ Incontinence
- ✔ Muscle weakness
- ✔ Parkinson’s Disease

- ✔ Stroke Functional Independence Measure Score (Maximum score 126):
  - ✔ Not available

- ✔ Montreal Cognitive Assessment Score (Maximum score 30):
  - 0

- ✔ Montreal Cognitive Impairment Score (MoCA < 26):
  - ✔ Not available

- ✔ Other, please specify:
  Trouble speaking due to aphasia. Chronic anemia.

3.11 Medications:

11  Number of prescription medications used by the faller on the day of the fall

- Medication Name:
  - Acetaminophen liquid 640mg/20
- Medication Name:
  - Atorvastatin 10mg
- Medication Name:
  - Clopidogrel 75mg
- Medication Name:
  - Levodopa-carbidopa 100/25mg
Medication Name:
Levodopa-carbidopa 200/50mg

Medication Name:
Metformin 500mg

Medication Name:
Mitazapine 30mg

Medication Name:
Ranitidine 150mg

Medication Name:
Thiamine 100mg

Medication Name:
Vitamin D3

Medication Name:
Insulin aspart (Novorapid)

Number of over-the-counter medications used by the faller on the day of the fall
The faller, an 84 year old gentleman fell in an acute care hospital room on Wednesday, June 20, 2012 at 3:28. The faller was admitted to the emergency room on June 5, 2012 where he was diagnosed with a left middle cerebral artery (MCA) stroke which left him with significant aphasia and right-sided weakness. During the 15 days in the hospital he remained calm and stable, and had never attempted to ambulate on his own. On June 20, 2012 the faller had a gastrojejunostomy (GJ) feeding tube inserted as he was unable to swallow appropriately. The night of the fall (June 20), the faller was positioned in bed and checked on every 90 minutes by his nurse. He felt restless and agitated and was unable to sleep. At approximately 3:25 the faller decided to get out of bed for unknown reasons. He pulled out his feeding tube and then walked five meters to the doorway of his hospital room, and stood briefly at the doorframe. He then lost balance and slid against the doorframe and fell to the ground. Two RNs, who were standing at the end of the hall near the nursing station of the unit, saw the faller lying on the ground of his room and rushed over to assist him. They helped him back to his bed and assessed him for injuries. No injuries were found.

The faller
This 84 year old stroke survivor was widowed 4 months prior to his stroke and he now lived alone. On June 5, 2012 he suffered a left MCA stroke, which was thought to be cardioembolic. He suffered from atrial fibrillation, hypertension, type 2 diabetes, chronic anemia, Parkinson’s disease, Cholecystitis, and alcoholism, as well as a remote history of smoking. He had significant difficulty communicating, especially word-finding but was able to say ‘yes’ and ‘no’. Medical staff found it very difficult to get answers from him during assessments due to his limited communication abilities. He had no control over swallowing and a GI tube was therefore inserted on June 20, 2012. Originally the GJ tube was scheduled to be inserted on June 19, 2012 but due to faller’s very low heart rate, the procedure was rescheduled. The faller suffered from very low heart rate (bradycardia) but refused a pacemaker. Because the faller was confused, it was not known if he had the cognitive capacity to make the decision for himself. His bradycardia posed continued risk to his safety. He was confused, and according to the physician, most probably suffered from neuropathy due to diabetes and alcoholism. Neuropathy causes a decrease in proprioception and sensation in the feet, making walking difficult and unsafe. The physician stated that in retrospect, due to confusion and possible neuropathy, this patient should not have been allowed out of bed at all, especially since he was assessed at high risk for falls upon admission. During his hospital stay he was given a walker and was ambulating only under supervision during physiotherapy sessions.

Medications
The faller was taking 11 prescription medications including medication for Parkinson’s disease (Levodopa-carbidopa). These medications are known to cause orthostatic hypotension, or a drop in blood pressure due to the change in body position from laying to standing. This may have led to a transient loss of consciousness and subsequently, the loss of balance.

Falls Prevention
Upon admission, patients who are assessed as high risk for falls are given a small bracelet that identifies them as at risk for falls. This bracelet is meant to be a visual cue for both hospital staff and the patient, to remind them not to fall. However, the capacity to understand what this means is low in stroke patients suffering from cognitive impairment. Although the faller was assessed as high risk for falls no specific strategy was put in place to prevent him from falling. Because the faller had not previously exhibited impulsive behaviour, increased safety measures were not put in place to prevent him from falling in case he did attempt to transfer or ambulate independently. Although the faller was given a walker and instructed on the use of the walker, his mental capacity to understand, learn or remember these instructions was very low. Standard practice in the unit was to continuously repeat
instructions to confused or cognitively impaired patients.

Monitoring of patients
Patients who suffer from confusion, neuropathies and especially aphasia, who are unable to verbally communicate their needs require more frequent if not continuous monitoring. The faller was confused and unable to understand and navigate the hospital environment. Due to his severe aphasia and confusion, the faller was incapable of communicating the reasons behind his decision to get out of bed. According to one of the attending physicians and the two RNs on duty the night of the fall, the faller could have been experiencing pain and discomfort due to a number of health conditions, including a newly inserted GJ feeding tube, bradycardia, peptic ulcers, cholecystitis, alcohol withdrawal and Parkinson’s disease. He was also suffering from diabetic neuropathy and had little sensation in his feet which caused problems with balance. Due to polypharmacy and the side-effects of stroke, the faller required frequent monitoring by nursing staff. The volatile combination of medications, confusion, decreased proprioception and an inability to communicate was not counterbalanced with good communication within the healthcare team so that the faller would have adequate supervision and monitoring for nonverbal communication and cues.

Unit staffing at night time
During the night shift there was one nurse taking care of seven patients. The RN was unable to supervise the faller more frequently than every 90 minutes due to a heavy workload and time constraints. According to a physician, “confused patients need to be watched more carefully. He is out of acute injury and it is a busy ward, they need to hire nurses to take care of people who are acutely ill because the sickest patients are the ones they’re going to be focusing on. We do not have enough nurses, we need more nurses. The cardiac observation monitoring is very expensive but we need more nurses!”

Communication with patients suffering from aphasia
Common characteristics displayed by a person who has aphasia may include decreased attention, decreased memory, inability to recall specific words, poor auditory comprehension, lack of ability to use words or gestures to make needs known and high levels of frustration. Nurses in the stroke unit are specially trained to care for stroke patients, including those suffering from aphasia. When communicating with aphasic patients, clinicians must talk simply and naturally and encourage the patient to respond in whatever way he/she can, encourage gestures and talking with hands. Nurses are instructed to tactfully change the subject when the patient is frustrated in trying to explain something and keep any instructions and explanations simple. Staff is encouraged to ask direct questions requiring a simple “yes” or “no” rather than those requiring complex answers. Staff is not to confuse the patient with too much idle chatter or too many people/distractions in the room (http://www.aphasia.org/naa_materials /communicating_with_people_who_have_aphasia.html). In the case of the faller, staff relied on “yes” and “no” responses from him and used visual aids such as body diagrams to indicate location of pain and calendars to orient him to date. The faller’s needs (stomach pain, frustration, and agitation) were not recognized by staff.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

IMG_1993.jpg
IMG_1994.jpg
IMG_1996.jpg
Low staffing at night does not allow more frequent patient supervision.
Falls safety assessment performed at time of admission identifies at risk patients and a bracelet is placed on their wrists.
A bracelet worn by high falls risk patients to remind them 'not to fall' is ineffective.
Discussion between RNs, physicians and other staff regarding patient safety due to falls in inadequate.
Faller is assessed as high risk for falls but an individualized falls prevention strategy is not put in place.

Organizational Factors:

- RN to patient ratio during the night is 1:7.
- Due to aphasia and GJ tube inserted earlier in the day, the faller requires frequent supervision.

Preconditions:

- Faller is restless.
- Faller suffers from depression.
- Faller's wife passed away four months ago.
- Faller is unable to communicate his discomfort due to aphasia.
- Faller feels discomfort due to GJ tube.
- Faller is an alcoholic going through alcohol withdrawal.
- Faller feels abdominal pain.
- Faller is confused and unable to understand where he is.
- Faller is on 11 prescription medications.
- Faller suffered a left MCA stroke two weeks ago.
- Faller does not adhere to staff instructions.
- Faller requires assistance of rollator to walk.
- Faller has poor sensation in his feet due to neuropathy.
- Faller suffers from Parkinson's disease.
- Medications for Parkinson's disease are known to cause orthostatic hypotension.
- Orthostatic hypotension can cause transient loss of consciousness.
- Faller suffers from bradycardia.
- Faller has muscle weakness.

Unsafe Acts:

- Faller's nurse checks up on faller every 90 mins. June 20, 2012. 2:25
- Faller is unable to sleep during night. June 20, 21:00- 3:25
- Faller gets out of his bed independently. 3:25
- Faller walks 5 meters towards the hospital room door. 3:27
- Faller loses his balance. 3:28
Conclusions

The faller, an 84 year old gentleman fell in an acute care hospital room on Wednesday, June 20, 2012 at 3:28. The faller was admitted to the emergency room on June 5, 2012 where he was diagnosed with a left middle cerebral artery (MCA) stroke which left him with significant aphasia and right-sided weakness. During the 15 days in the hospital he remained calm and stable, and had never attempted to ambulate on his own. On June 20, 2012 the faller had a gastrojejunostomy (GJ) feeding tube inserted as he was unable to swallow appropriately. The night of the fall (June 20), the faller was positioned in bed and checked on every 90 minutes by his nurse. He felt restless and agitated and was unable to sleep. At approximately 3:25 the faller decided to get out of bed for unknown reasons. He pulled out his feeding tube and then walked five meters to the doorway of his hospital room, and stood briefly at the doorframe. He then lost balance and slid against the doorframe and fell to the ground. Two RNs, who were standing at the end of the hall near the nursing station of the unit, saw the faller lying on the ground of his room and rushed over to assist him. They helped him back to his bed and assessed him for injuries. No injuries were found.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller was confused and unable to understand and navigate the hospital environment. Due to his severe aphasia and confusion, the faller was incapable of communicating the reasons behind his decision to get out of bed. According to one of the attending physicians and the two RNs on duty the night of the fall, the faller could have been experiencing pain and discomfort due to a number of health conditions, including a newly inserted GJ feeding tube, bradycardia, peptic ulcers, cholecystitis, alcohol withdrawal and Parkinson’s disease. He was also suffering from diabetic neuropathy and had little sensation in his feet which caused problems with balance.

* Because the faller had difficulty communicating and following commands it was not possible to determine if he lost consciousness before he fell. The faller was taking 11 prescription medications including medication for Parkinson’s disease (Levodopa-Carbidopa). These medications are known to cause orthostatic hypotension. This may have led to a transient loss of consciousness and subsequently, the loss of balance.

* The faller was identified as at a high risk for falls upon admission but his safety was not analyzed or discussed in sufficient depth amongst the healthcare team. There was a lack of communication between members of the healthcare team about individualized falls prevention. Falls safety was not high priority during rounds or verbal reporting at shift change.

* Due to polypharmacy and the side-effects of stroke, the faller required frequent monitoring by nursing staff. The volatile combination of medications, confusion, decreased proprioception and an inability to communicate required better communication within the healthcare team so that the faller would have adequate supervision and monitoring for nonverbal communication cues.

* The faller was unable to swallow safely and had a GJ tube inserted on June 20, 2012. This procedure was originally scheduled for June 19th but because he had a very low heart rate the procedure was rescheduled. A pacemaker was recommended but the faller refused. Because the faller was confused, it was not known if he had the cognitive capacity to make the decision for himself. His bradycardia posed continued risk to his safety.

* Although the faller was given a walker and instructed on the use of the walker, his mental capacity to understand, learn or remember these instructions was very low. Repetition of instructions to confused or cognitively impaired patients was an ineffective strategy to improve their safety. Also, patients who were assessed as high risk for falls were given a small bracelet that identifies them as at risk for falls. This bracelet is meant to be a visual cue for both hospital staff and the patient, to remind the patient not to fall. However, the capacity to understand what this means was low in stroke patients suffering from cognitive impairment.

* Patients who suffer from confusion, neuropathies and especially aphasia, who are unable to verbally
communicate their needs require more frequent if not continuous supervision by hospital staff.
* Due to the limited number of nurses during the night shift (1 nurse for 7 patients), the RN was unable to supervise the faller more frequently than every 90 minutes. According to a physician, “confused patients need to be watched more carefully. He is out of acute injury and it is a busy ward, they need to hire nurses to take care of people who are acutely ill because the sickest patients are the ones they’re going to be focusing on. We do not have enough nurses, we need more nurses. The cardiac observation monitoring is very expensive but we need more nurses!” Without more resources, it is not possible to decrease the number of falls in the unit.
* Although the faller was assessed as high risk for falls, no specific strategy was put in place to prevent him from falling. Because the faller had not previously exhibited impulsive behaviour, increased safety measures were not put in place to prevent him from falling in case he did attempt to transfer or ambulate independently.
Faller's condition is stable while at unit. June 5-19.

Faller is ineffective.

Discussion between RNs, physicians and other staff regarding patient safety due to falls in inadequate.

Faller is unable to sleep away four months ago.

Faller feels discomfort going through alcohol withdrawal.

Case 16961: Sequence of Events

https://secure.empowerhealthresearch.ca/report/soe
Faller pulls out his feeding tube. 3:25

Faller gets out of his bed independently. 3:25

Faller feels abdominal pain.

Faller is confused and unable to understand where he is.

Faller is assessed as high risk for falls but an individualized falls prevention strategy is not put in place.

Faller is on 11 prescription medications.

Faller suffered a left MCA stroke two weeks ago.

Faller does not adhere to staff instructions.

Faller walks 5 meters towards the hospital room door. 3:27

Faller requires assistance of rollator to walk.

Faller has poor sensation in his feet due to neuropathy.

Faller grabs onto the door frame. 3:28
Faller stands motionless for 10 seconds. 3:28

Faller loses his balance. 3:28

Faller slides against the door frame. 3:28

Faller lands on the floor. 3:28

Faller suffers from Parkinson's disease.

Medications for Parkinson's disease are known to cause orthostatic hypotension.

Orthostatic hypotension can cause transient loss of consciousness.

Faller suffers from bradycardia.

Faller has muscle weakness.

Two nurses see the faller lying on his right backside in doorway. 3:29

Two RNs rush to assist the faller. 3:30

Two RNs assist faller back to his bed and assess him for injuries. No injuries are found. 3:32
Fall Information

2.1 Date of the fall: 2012-02-14
2.2 Day: Tuesday

2.3 Time of fall: 24-hour clock
   12:45

2.4 Witnesses: Un-witnessed

2.5 Location of the fall: Indoors
   Public building (includes hospitals or long term care homes)
   Hospital or LTC room

2.6 Activity at the time of the fall:
   Sitting (wheelchair)

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
   ✔ Getting into bed, chair toilet, bath, shower
   ✔ Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:
   Loss of support

2.9 Direction of the fall:
   Forward
2.10 Environment at the fall location:

☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

☑ Slippers

2.13 How did faller get up after the fall?

☑ Assisted by another person

☑ Nurse/Other staff

☑ Assisted by 3 nurses

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☑ Yes

2.15 Injury severity:

☑ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☑ Abrasion/scrape

☑ Bruise

☑ Laceration/cut

2.17 Injury location:
2.18 Type of medical attention received:

☑️ Leg, knee, foot, toe(s) ☑️ Right
☑️ Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

Attempting to transfer from wheelchair to bed by himself without supervision for first time.
3.1. Demographics:

Year of birth: 1946  Age Calculated: 66
Gender: Male
Population (Check all that apply): Senior  Stroke survivor

3.2 Falls history:
- Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency
   Number of falls in the last week: 1
   Number of falls in the last month: 1
   Number of falls in the last year: 2

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):
   - Unknown

3.4 Marital status:
- Married

3.5 Mental status:
- Confused or disoriented
- Other, please specify:
  Faller has difficulty finding words.

3.6 MMSE score:

16

3.7 Education:
- Secondary school partial

3.8 Mobility aids:
3.11 Medications:

27 Number of prescription medications used by the faller on the day of the fall

Medication Name:
Sodium phosphates

Medication Name:
Trazadone

Medication Name:
Oseltamivir -flu prophylaxis

Medication Name:
Acetaminophen

Medication Name:
Bisacodyl

Medication Name:
Dimenhydrinate tab

Medication Name:
Dimenhydrinate injection
<table>
<thead>
<tr>
<th>Medication Name:</th>
<th>Docusate sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication Name:</td>
<td>Glucagon recombinant</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Glucose tab</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Lactulose</td>
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<tr>
<td>Medication Name:</td>
<td>Magnesium hydroxide</td>
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<tr>
<td>Medication Name:</td>
<td>Microlax</td>
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<tr>
<td>Medication Name:</td>
<td>Psyllium mucilloid</td>
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<tr>
<td>Medication Name:</td>
<td>Salbutamol</td>
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<tr>
<td>Medication Name:</td>
<td>Sennosides</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Nicotine patch</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Nor triptyline</td>
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<tr>
<td>Medication Name:</td>
<td>Oxycodone</td>
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<td>Spironolactone</td>
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<tr>
<td>Medication Name:</td>
<td>Valsartan</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Vitamin D3</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Warfarin</td>
</tr>
<tr>
<td>Medication Name:</td>
<td>Acetaminophen-oxydalone</td>
</tr>
</tbody>
</table>

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 66 year old stroke survivor, fell to the ground in the rehabilitation hospital on February 14, 2012 at 12:45. After eating lunch in the dining hall of the stroke rehabilitation unit, his RN wheeled the faller back to his room. The faller’s wheelchair was parked in the corner of his room facing his bed where he could watch television. The wheelchair breaks were locked and the distance between the wheelchair and the bed was approximately 1.5 meters. After watching television for 10 minutes, the faller decided that he no longer wanted to sit in his wheelchair but would rather lie in bed. One day before his fall, the faller had successfully transferred from wheelchair to bed independently during his regular physiotherapy session. This independent transfer was supervised by the physiotherapist and the faller was advised not to attempt any independent transfers regardless of the success during therapy. The faller released the wheelchair breaks, used his left leg to propel himself to the side of the bed where he locked the breaks. He then placed his left hand on the mattress and attempted to lift his body onto the bed. The faller’s left arm gave way and he lost balance. He grabbed onto the siderails of the bed to try to regain balance but was unable to do so and ended up landing forward onto the ground. Two nurses and one personal support worker working in the unit heard the noise and rushed to the faller’s room. The faller was found lying on his stomach, parallel to the bed with his head near the wall. The faller was then assisted into bed by two nurses and assessed for injuries. He sustained minor injuries to his right knee (scrapes and bruising).

It was noted that the faller suffered from anxiety which manifested as pain in his shoulders and neck. At the time of the fall, the faller’s nurse had gone for lunch and the faller did not use the call bell to call for assistance from the covering RN. The faller had been instructed not to transfer independently and to call for assistance. However, the faller “did not want to bother the covering nurse” and felt that since he had successfully transferred into bed the day before, during PT session, he would be able to do it again. At the time of the fall, the call bell was located on the faller’s bed and easily accessible.

The faller:

The faller was a 66 year old, right hand dominant, married man who was found on the floor at home by his spouse on December 1, 2011. He had slurred speech and right sided weakness. He was admitted to an acute care hospital the same day with a diagnosis of a left hemisphere stroke, affecting the left posterior cerebral artery and middle cerebral artery territory with a related internal carotid artery stenosis (narrowing or constriction of the inner surface of the carotid artery). He had a carotid stent insertion performed on December 15, 2011. He was admitted into the Stroke Rehabilitation Program on January 17, 2012. The faller experienced his first stroke approximately 10 years ago, with left internal carotid artery stenosis and an endarterectomy. He also had a history of hypertension, type 2 diabetes, chronic constipation, dyspepsia, as well as a history of smoking and alcohol use (12 beers a day). The faller worked as a hospital security guard and he retired in March, 2011. Post-stroke, he had a dense right plegia of the arm and a paresis of his right leg. He was able to partially straighten his knee and lift his leg against gravity. He required assistance with all activities of daily living (ADLs) and assistance from at least one person for pivot transfers and two people for full transfers due in large part to his right side weakness and apraxia. He required a wheelchair for mobility and he tolerated being in a wheelchair for approximately two hours but his endurance fluctuated. He was able to communicate his needs, but had difficulty finding words. He was alert and oriented but had right sided neglect and staff believed he suffered from depression although his spirits improved in the last few weeks of rehabilitation. The faller had significant anxiety which was expressed in complaints of increased pain in neck and upper shoulder regions. The faller was 183 cm tall and weighed 127 kg.

Lunch time staffing levels
In the stroke rehabilitation unit, there are 30 patient beds and each nurse is responsible for 4-5 stroke patients. During the lunch period, the number of nurses in the unit is reduced by 50%. Normally, there are seven RNs and one resource nurse from 07:00-15:00. The resource nurse is in charge of the unit from 07:00-15:00, Monday-Friday. She is familiar with all patients throughout the week since she does not work shifts and is consistently present in
the unit. There are two assigned lunch-time breaks: 11:30 and 12:00. The length of the lunch break depends on the length of the shift the RN is working. An RN who is working a 12 hour shift is permitted 45 minutes for lunch, while an RN who is working an eight hour shift is allowed a 30 minute lunch break. Lunch break does not always begin promptly at 11:30 or 12:00 and depends on how busy the RN is. RNs are assigned to specific lunch time breaks by the unit management team and this is communicated via an assignment sheet located at the main nursing desk in the unit. On the day of the fall, there were five RNs working in the unit because the unit was not full and seven RNs were not needed. During lunch time, on the day of the fall, two RNs had gone for lunch break while three RNs remained in the unit.

Staff communication
Information about patients is communicated to different members of the team through the Kardex. The Kardex is a card-filing system that allows quick reference to the particular needs of each patient for certain aspects of nursing care. Included on the card may be a schedule of medications, level of activity allowed, ability to perform basic self-care, diet, any special problems, a schedule of treatments and procedures, and a care plan. The Kardex is updated as necessary and is usually kept at the nurses’ station or by the patient’s bed. It is the responsibility of all team members to communicate any significant changes or issues a patient is having to other members of the health care team through either documentation in the Kardex, the medical chart or through verbal communication. Although the PT was aware that the faller had been acting overconfident, this was not communicated to other team members through the Kardex system or verbally.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

IMG_5951.JPG
IMG_5952.JPG
IMG_5953.JPG
There is no policy to specify minimum RN to stroke patient ratio in the unit.
- Standard practice during lunch break is that number of RNs is reduced by 40-50%.
- Budget cuts have increased the RN to patient ratio from 1:3 or 4 to 1:4 or 5.
- PT did not use Kardex to communicate to others in health care team that faller successfully transferred independently for the first time yesterday in PT session.
- Constant reminders are the only strategy put in place to deal with faller’s refusal to use the call bell.

During lunch break, 2 RNs go for lunch while 3 stay in the unit.
- The day before the fall, the faller, for the first time, transferred independently with supervision of PT.
- Faller requires supervision during all transfers.
- RN is unaware that faller for the first time transferred independently, with supervision in PT session yesterday.
- Faller does not want to bother covering RN.
- Faller’s RN is on lunch break.
- Staff is unaware of faller’s actions while alone.
- Staff continuously remind faller to use the call bell.

Faller has increased confidence in his ability to transfer independently.
- Faller is tired of sitting on wheelchair.
- Faller feels drowsy after eating lunch.
- Faller does not use call bell to call for help.
- Faller experiences pain in both shoulders after his stroke.
- Faller can’t put weight on his arms.
- Faller’s left arm is weak and his right arm is flacid.
- Faller suffered a left hemisphere stroke 7 weeks ago.
- Faller is fatigued.
- Faller is on 27 prescription medications.
- Side effects from some of the medications faller takes include drowsiness and fatigue.
- Faller has significant muscle weakness on right side of body.

Faller’s RN starts lunch break. 12:20
- Faller decides to transfer to his bed on his own. 12:43
- Faller ignores the call bell on his bed. 12:44
- Faller ignores instructions to call for assistance with transfers. 12:44
- Faller’s left arm gives way. 12:45
- Faller loses balance. 12:45
Conclusions

The faller, a 66 year old stroke survivor, fell to the ground in the rehabilitation hospital on February 14, 2012 at 12:45. After eating lunch in the dining hall of the stroke rehabilitation unit, his RN wheeled the faller back to his room. The faller’s wheelchair was parked in the corner of his room facing his bed where he could watch television. The wheelchair breaks were locked and the distance between the wheelchair and the bed was approximately 1.5 meters. After watching television for 10 minutes, the faller decided that he no longer wanted to sit in his wheelchair but would rather lie in bed. One day before his fall, the faller had successfully transferred from wheelchair to bed independently during his regular physiotherapy session. This independent transfer was supervised by the physiotherapist and the faller was advised not to attempt any independent transfers regardless of the success during therapy. The faller released the wheelchair breaks, used his left leg to propel himself to the side of the bed where he locked the breaks. He then placed his left hand on the mattress and attempted to lift his body onto the bed. The faller’s left arm gave way and he lost balance. He grabbed onto the siderails of the bed to try to regain balance but was unable to do so and ended up landing forward onto the ground. Two nurses and one personal support worker working in the unit heard the noise and rushed to the faller’s room. The faller was found lying on his stomach, parallel to the bed with his head near the wall. The faller was then assisted into bed by two nurses and assessed for injuries. He sustained minor injuries to his right knee (scratches and bruising).

It was noted that the faller suffered from anxiety which manifested as pain in his shoulders and neck. At the time of the fall, the faller’s nurse had gone for lunch and the faller did not use the call bell to call for assistance from the covering RN. The faller had been instructed not to transfer independently and to call for assistance. However, the faller “did not want to bother the covering nurse” and felt that since he had successfully transferred into bed the day before, during PT session, he would be able to do it again. At the time of the fall, the call bell was located on the faller’s bed and easily accessible.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

Due to his stroke the faller had substantial functional disabilities including a flaccid right arm and significant muscle weakness in his left arm and leg. He also suffered from pain in his shoulders and neck.

The faller needed assistance with all activities of daily living and always required one person assisting with transfers and ambulation. At the time of the fall he was unsupervised, he did not call for help and was unsuccessful in his attempt to transfer from the wheelchair into bed.

Despite regular PT sessions, faller was not strong enough to transfer independently and was working on becoming stronger during therapy.

Before the fall, the faller participated in OT session in the OT gym and later ate lunch. Faller sat in his wheelchair for 20 minutes watching tv after lunch and he felt tired. Therapy session and lunch had made the faller feel fatigued. The faller’s endurance for sitting in the wheelchair was usually good; he could handle two hours on most days, but fluctuated from day to day depending on mood and energy levels.

The day before the fall, the faller had successfully transferred independently under the supervision of the PT. At the time of the fall the faller believed that he was capable of transferring into the bed by himself. He overestimated his abilities and underestimated his disabilities. Although the PT was aware that the faller had been acting overconfident, this was not communicated to other team members through the Kardex system or verbally.

Although the faller was repeatedly told to call for assistance when wanting to transfer, he decided not to because he did not want to bother the covering RN.

Independence and quick recovery were encouraged on this rehab unit, but there were no policy or best practice guidelines to educate patients about trade offs between improving function and preserving safety. A staff member
best describe this as: “the more the patient can do for themselves the more rehabilitative it is, but often it is a fine line.”

Due to budget cuts, staffing ratios have been changed from 3-4 patients per nurse to 4-5 patients per nurse in this stroke rehabilitation unit. On any given day there is an average of seven nursing staff and one resource nurse for 30 patients. During lunch breaks, 3-4 nurses will take turns going for lunch. At the time of the fall there were three nurses in the unit while two went for lunch. Currently, there is no policy to specify minimum RN to stroke patient ratio in the unit.
Faller is admitted to acute care hospital. Dec. 18, 2011


Faller is transferred to rehabilitation hospital. Jan. 17, 2012

Faller has a dressing and dressing is removed. Faller now eats solid foods. February 12, 2012

Faller has second stroke with substantial functional consequences, including plegia of right arm and paresis of right leg. Dec. 18, 2011

Faller wakes up. Feb. 14, 2012 08:00

Faller uses urinal at bedside. 08:05

Faller has breakfast in bed. 08:05-8:45

Faller's feeding tube is removed. Faller now eats solid foods. February 12, 2012

Faller has a dressing and dressing is removed. Faller now eats solid foods. February 12, 2012

Faller is wheeled to OT gym for therapy session by occupational therapy assistant (OTA). 11:30-11:45

Faller is wheeled back to room by OTA. 11:47

Faller rests in bed. 09:15-11:30

Faller is wheeled to OT gym for therapy session by occupational therapy assistant (OTA). 11:30-11:45

OTA informs RN that Faller is back in his room. 11:48

Faller's RN tells him she is going on lunch break. 12:16

Faller's RN wheels him back to his room. 12:16

Faller eats lunch in the dining hall. 11:50-12:15

RN wheels Faller to the dining hall for lunch. 11:49
PT did not use Kardex to communicate to others in health care team that faller successfully transferred independently for the first time yesterday in PT session.

Faller's RN starts lunch break. 12:20

There is no policy to specify minimum RN to stroke patient ratio in the unit.

During lunch break, 2 RNs go for lunch while 3 stay in the unit.

Standard practice during lunch break is that number of RNs is reduced by 40-50%.

Budget cuts have increased the RN to patient ratio from 1:3 or 4 to 1:4 or 5.

Faller sits on wheelchair watching television. 12:20-12:43

The day before the fall, the faller, for the first time, transferred independently with supervision of PT.

Faller has increased confidence in his ability to transfer independently.

Faller is tired of sitting on wheelchair.

Faller requires supervision during all transfers.

Faller feels drowsy after eating lunch.

RN is unaware that faller for the first time transferred independently, with supervision in PT session yesterday.

PT did not use Kardex to communicate to others in health care team that faller successfully transferred independently for the first time yesterday in PT session.

Faller does not want to bother covering RN.

Faller's RN is on lunch break.

Faller decides to transfer to his bed on his own. 12:43

Faller propels wheelchair with his left leg. 12:44
Faller is fatigued.

Faller is on 27 prescription medications.

Side effects from some of the medications Faller takes include drowsiness and fatigue.

Faller attempts to pull himself onto the bed using his left arm. 12:45

Staff is unaware of Faller’s actions while alone.

Faller does not use call bell to call for help.

Faller’s left arm gives way. 12:45

Faller loses balance. 12:45

Faller grabs the bedrail with left hand. 12:45

Faller’s left arm is weak and his right arm is flacid.

Faller suffered a left hemisphere stroke 7 weeks ago.

Faller is fatigued.

Faller can’t put weight on his arms.

Faller experiences pain in both shoulders after his stroke.

Staff continuously remind Faller to use the call bell.

Constant reminders are the only strategy put in place to deal with Faller’s refusal to use the call bell.

He positions wheelchair by the bed. 12:44

Faller locks wheelchair breaks. 12:44

Faller ignores the call bell on his bed. 12:44

Faller ignores instructions to call for assistance with transfers. 12:44
Three RNs and one PSW come into faller’s room.
12:46

Faller lands on the floor.
12:45

Faller scrapes his right knee on the ground.
12:45

Three RNs and one personal support worker (PSW) hear the noise.
12:46

Three RNs and one PSW assist faller back into bed.
12:47

RNs assess faller for injuries.
12:50

He sustained minor scrapes and bruising on his right knee.
SFIM Investigative Report

Grumpy Lack of Insight
Fall Information

2.1 Date of the fall: 2012-04-27
2.2 Day: Friday

2.3 Time of fall: 24-hour clock
13:00

2.4 Witnesses: Witnessed
Number of people at the scene? 1

2.5 Location of the fall:
- Indoors
- Public building (includes hospitals or long term care homes)
- Hospital or LTC room

2.6 Activity at the time of the fall:
- Sitting (wheelchair)

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
- Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:
- Loss of support

2.9 Direction of the fall:
- Forward
2.10 Environment at the fall location:

☑ Equipment failure contributed to the fall
Wheelchair breaks did not lock properly due to faller's inability to fully lock the breaks.

2.11 Mobility aid used at the time of the fall:

☑ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

☑ Shoes

2.13 How did faller get up after the fall?

☑ Assisted by another person

☑ Nurse/Other staff

☑ 3 nurses

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☑ Yes

2.15 Injury severity:

☑ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☑ Abrasion/scrape

☑ Bruise

2.17 Injury location:

https://secure.empowerhealthresearch.ca/report/finalReport
2.18 Type of medical attention received:

- Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

- Yes, please specify:
  Faller attempted an independent transfer for the first time.
Information About the Faller

3.1. Demographics:

Year of birth: 1962-07-19 Age Calculated: 50
Gender: Male
Population (Check all that apply): 
- Acquired brain injury
- Stroke survivor

3.2 Falls history:
- Rare faller (fell only this one time in the past year)

3.4 Marital status:
- Single

3.5 Mental status:
- Agitated/aggressive/combative
- Isolated
- Normal, alert and oriented
- Depressed
- Other, please specify: Angry/frustrated when people don’t understand him.

3.6 MMSE score:
- 23

3.7 Education:
- Secondary school partial

3.8 Mobility aids:
- Assistance by another person All of the time
- Wheelchair All of the time

3.9 Other aids used by the faller:
- Bath bench/shower seat
- Bed alarm
Bed rails

Raised toilet seat/Commode

Seat belt in wheelchair

Shower chair

3.10 Medical problem at the time of the fall:

- Acquired brain injury
- Blood pressure (high or low)
- Deconditioning
- Depression
- Incontinence
- Muscle weakness
- Pain

- Stroke Functional Independence Measure Score (Maximum score 126):
  
  - Montreal Cognitive Assessment Score (Maximum score 30):
    - 14

- Montreal Cognitive Impairment Score (MoCA < 26):
  - Yes

3.11 Medications:

5 Number of prescription medications used by the faller on the day of the fall

<table>
<thead>
<tr>
<th>Medication Name:</th>
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<tbody>
<tr>
<td>Chlorhexidine mouthwash</td>
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<tr>
<td>Metoprolol 25 mg</td>
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<tr>
<td>Mirtazapine 15 mg</td>
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<tr>
<td>Pantoprazole 40 mg</td>
<td></td>
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<tr>
<td>Ramipril 5 mg</td>
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</tbody>
</table>

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 50 year old stroke survivor fell on April 27, 2012 at approximately 13:00 during his stay at a rehabilitation hospital. The faller was admitted to the emergency room of an acute care hospital on January 9, 2012 after being found unconscious, lying between 2 cars. He was reported to have slurred speech, headache and admitted to drinking the night before. The faller had a history of drug abuse (cocaine). A CT scan showed a subarachnoid hemorrhage, intraventricular hemorrhage secondary to an aneurysm rupture. When the faller’s medical condition had stabilized, he was transferred to a rehabilitation hospital on March 12, 2012. At the time of his admission to the stroke rehabilitation unit, the faller presented with right side hemiplegia, word finding deficits and dysphagia. He required G-J feeding tube for nutrition, total care for ADLs and two people to assist with all transfers. Although he was oriented and generally cooperative, he lacked motivation to improve and lacked insight into his disability. On April 25, 2012, the faller no longer required tube feeding and started to eat solid food by mouth. On April 26, 2012, the faller received a custom fit wheelchair because the generic hospital wheelchair that he was using previously did not fit him well and caused his legs to hang from the side of the foot rest. On the day of the fall, the faller woke up at 08:00, ate breakfast in bed with the help of his nurse and watched television until 10:30. At 10:30 the PTA came to take the faller to the gym for his PT session but the faller refused to participate. Instead he spent another hour watching TV until his OT session at 11:30. At 12:00, the faller’s RN took the faller to the dining hall for lunch where the faller ate his lunch quickly and wheeled himself to his room where he preferred to stay. Although aware that the faller had returned to his room, the RN believed that he would remain in his wheelchair. At 12:30 faller’s RN went for her lunch break. The faller sat in his wheelchair from 12:25 until approximately 12:57 when he could no longer tolerate sitting due to fatigue and discomfort. He decided to transfer to his bed on his own and did not call for help using the call bell because he did not want to disturb the nurse. He moved his wheelchair close to the bed, attempted to lock the breaks of the wheelchair then scooted to the edge of his wheelchair. He placed his left hand on the mattress of the bed and attempted to lift his body onto the bed. However, when he shifted weight on his left arm, his left elbow suddenly gave way and the faller lost balance and fell forward on the ground onto his right elbow and ribs, with his legs positioned underneath the wheelchair. The faller’s roommate witnessed the fall and rushed outside to the main front desk to call for help. The three RNs that were on the unit at the time came rushing to the faller’s room and assisted him back to his bed. They assessed him for injuries but only minor injuries (scrape and redness on elbow, ribs and temple, later a bruise on elbow) were found.

The faller
The faller was a 50 year old right-handed gentleman with a history of drug abuse who was living between two cities and working construction jobs. After a night of heavy drinking, the faller was found unconscious lying between 2 cars on January 9, 2012. A CT scan showed a Fisher 3 subarachnoid hemorrhage and early hydrocephalus. He underwent cerebral angiography on January 9 which discovered multiple intracranial aneurysms on both the left and right carotid arteries. During a procedure (coiling of the aneurysms) a thrombus resulted in a left lenticular and caudate infarction and right hemiparesis. The faller was admitted to the ICU, where he stayed for 46 days. During his stay in the ICU, the faller had several episodes of fever with pneumonia and antibiotic treatment. He also underwent tracheostomy and gastrojejunostomy tube placement. The faller had also sustained multiple fractures to his left arm in the past while at work. He made slow but gradual gains while in rehabilitation. He frequently appeared frustrated with his status and disinterested in therapy.

The faller suffered from depression and was often unmotivated and uncooperative with therapists. He suffered from memory problems and was unable to apply instructions he was given to new situations. He was also embarrassed with his inability to function normally and lacked insight into his disability.

Family
The faller was not married and did not have any children. He had 6 siblings, but only 2 sisters who lived in the area. Faller’s two sisters offered minimal support and were not involved with the faller’s care on a day-to-day basis. Due
to his history of substance abuse he was estranged from his sisters until he was admitted to the hospital and they were contacted for assistance with substitute decision making. The faller’s girlfriend had committed suicide 2 years ago and the faller suffered from depression.

Therapy
The faller often lacked motivation to participate in therapy and could only tolerate being in his wheelchair for short periods of time due to discomfort and fatigue. He became quite frustrated when people did not understand him, as he was dysarthric and had word finding difficulties. He lacked insight into his disability and believed that he would be returning home/to normal life soon. Therapists noted that the faller “attended therapy sessions but his level of participation varied depending on mood. He lacked judgment and would become fixated on certain beliefs, i.e., dependency on the sling, need to lower wheelchair. He lacked insight, attention, organization and memory. He was impulsive and unsafe in his judgments. He required frequent repetition and instruction and clear expectations for behaviour as he had difficulty extrapolating new information.”

Staffing levels
When staffing levels in the unit were low due to staff calling in sick, then every effort was made to find a replacement registered nurse. However, if this was unsuccessful then the next step was to rely on a “different skill mix” where a registered practical nurse (RPN) or a personal care provider (PCP) were brought in in lieu of a nurse. This was only permitted if there is a safe nursing quota (5-6 patients per nurse) in the unit. Since a RN had a greater scope of practice than an RPN or PCP, the tasks that can be performed by the replacements were limited and any additional work that was only allowed to be completed by a RN was offloaded to the available RNs. If a “different skill mix” was not feasible, then the case load of the absent RN was re-distributed to the available staff. This caused an increase in the workload for the RNs in the unit and an undesirable option but at times inevitable.

Wheelchair
Upon admission, patients are given generic wheelchairs from a pool of available wheelchairs in the unit. Prescription for a customized wheelchair is done on a case-by-case basis in the stroke rehabilitation unit. Not all patients admitted to the unit receive a customized wheelchair because it is anticipated that some will not require a wheelchair when they leave the unit. The OT, in conjunction and collaboration with the PT is responsible for fitting a wheelchair to a patient. Rehab and long-term goals are discussed and if a wheelchair is deemed necessary for the long-term then a customized wheelchair is prescribed. According to unit management, “Rehab continues when they leave here and there’s no sense in prescribing something that’s not going to serve them in the long-term. We don’t look to that because it’s not the best use of the health care system dollars”. The unit has authorized assistive devices program (ADP) staff who give prescriptions for customized wheelchairs. In this case, the faller was not prescribed a wheelchair until it was determined by the health care team that he would require the use of a wheelchair after discharge from the rehabilitation hospital. This process took 45 days (Mar 12 - Apr 26, 2012)

Communication with patients who have cognitive impairments
Every effort was made to support informed communication with patients who suffer from cognitive impairment. At the discretion of the speech language pathologist, different methods of communication are utilized with such patients, including the use of picture/white boards, writing out words, simple questions only requiring simple “yes” or “no” responses. The standard practice at the unit is to continuously repeat instructions to cognitively impaired patients.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

SFIM case 1 xs picture 2.JPG
SFIM case 1 xs picture.JPG
SFIM
Case ID: 2200212
Date: 2013-06-06
Subject #: 16433

Swiss Cheese Report

Organizational Factors:
- It takes rehab team 45 days to get custom fitting wheelchair for the faller.
- There is a shortage of nursing staff in unit today, usually 7 RNs in unit, today there are only 5.
- When two RNs go on lunch break, only three RNs are on the unit.

Supervision:
- Staff constantly repeat instructions to cognitively impaired faller.
- Faller is unsupervised while he transfers to his room.
- Three RNs are assisting other patients with meals in the dining hall.
- Covering RN is unaware that faller does not tolerate sitting in wheelchair for more than 20 minutes.
- Faller does not call covering RN for help because he does not want to bother her.
- Faller has never transferred independently before.
- Faller is unsupervised while attempting a transfer.

Preconditions:
- Faller overestimates his ability to transfer independently due to better-fitting wheelchair.
- Previously, faller was using a generic wheelchair from the hospital that did not fit him well.
- Faller has difficulty applying instructions to new situations.
- Faller had difficulty with memory.
- Faller does not follow instructions from healthcare team well.
- Faller is depressed.
- Faller has no motivation to recover.
- Faller is not cooperative with rehabilitation team.
- Faller is unaware of the level of his disability.
- Faller prefers to be in his room.
- Faller does not like socializing.
- Faller is in a bad mood today.
- Faller started eating solid food two days ago when feeding tube was removed.
- Faller can tolerate sitting in his wheelchair for a maximum of 20 minutes.
- Faller is embarrassed about his disabilities.
- Faller ignores the call bell close to him.
- Faller is too weak to properly lock the wheelchair breaks.
- Faller suffered a subarachnoid hemorrhage and intraventricular hemorrhage 16 weeks ago.
- Faller is on five prescription medications.
- Faller is not fully familiar with new custom-fitted wheelchair.
- The custom-fitted wheelchair is new, faller received it yesterday.
- Faller is not strong enough to support his weight.
- Faller requires assistance from at least 2 other people for all transfers.
- Faller has muscle atrophy.
Unsafe Acts:

- Faller receives custom fitted wheelchair from rehab team. Apr 26, 2012
- OT trains faller on use of new wheelchair. April 26, 2012
- Faller refuses to participate in physiotherapy session. 10:30
- Faller propels himself back to his room from dining hall using left foot. 12:20-12:25
- Faller's RN goes for her lunch break. 12:30
- Faller sits in wheelchair watching tv. 12:25-12:57
- Faller decides to transfer to bed on his own. 12:57
- Faller attempts to lock the wheelchair breaks. 12:58
- Faller over-reaches.
- Faller attempts to transfer to bed by putting his left hand on mattress. 12:59
- Faller loses his balance.
- Faller's left arm gives way. 13:00
The faller, a 50 year old stroke survivor fell on April 27, 2012 at approximately 13:00 during his stay at a rehabilitation hospital. The faller was admitted to the emergency room of an acute care hospital on January 9, 2012 after being found unconscious, lying between 2 cars. He was reported to have slurred speech, headache and admitted to drinking the night before. The faller had a history of drug abuse (cocaine). A CT scan showed a subarachnoid hemorrhage, intraventricular hemorrhage secondary to an aneurysm rupture. When the faller’s medical condition had stabilized, he was transferred to a rehabilitation hospital on March 12, 2012. At the time of his admission to the stroke rehabilitation unit, the faller presented with right side hemiplegia, word finding deficits and dysphagia. He required G-J feeding tube for nutrition, total care for ADLs and two people to assist with all transfers. Although he was oriented and generally cooperative, he lacked motivation to improve and lacked insight into his disability. On April 25, 2012, the faller no longer required tube feeding and started to eat solid food by mouth. On April 26, 2012, the faller received a custom fit wheelchair because the generic hospital wheelchair that he was using previously did not fit him well and caused his legs to hang from the side of the foot rest. On the day of the fall, the faller woke up at 08:00, ate breakfast in bed with the help of his nurse and watched television until 10:30. At 10:30 the PTA came to take the faller to the gym for his PT session but the faller refused to participate. Instead he spent another hour watching TV until his OT session at 11:30. At 12:00, the faller’s RN took the faller to the dining hall for lunch where the faller ate his lunch quickly and wheeled himself to his room where he preferred to stay. Although aware that the faller had returned to his room, the RN believed that he would remain in his wheelchair. At 12:30 faller’s RN went for her lunch break. The faller sat in his wheelchair from 12:25 until approximately 12:57 when he could no longer tolerate sitting due to fatigue and discomfort. He decided to transfer to his bed on his own and did not call for help using the call bell because he did not want to disturb the nurse. He moved his wheelchair close to the bed, attempted to lock the breaks of the wheelchair then scooted to the edge of his wheelchair. He placed his left hand on the mattress of the bed and attempted to lift his body onto the bed. However, when he shifted weight on his left arm, his left elbow suddenly gave way and the faller lost balance and fell forward on the ground onto his right elbow and ribs, with his legs positioned underneath the wheelchair. The faller’s roommate witnessed the fall and rushed outside to the main front desk to call for help. The three RNs that were on the unit at the time came rushing to the faller’s room and assisted him back to his bed. They assessed him for injuries but only minor injuries (scrape and redness on elbow, ribs and temple, later a bruise on elbow) were found.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller suffered from depression and was often unmotivated and uncooperative with therapists. He suffered from memory problems and was unable to apply new instructions. He was embarrassed with his inability to function normally and lacked insight into his disability.

* Standard nursing practice on the unit was to have patients sit and not lie down after meals so that food was passed along the digestive tract appropriately. This is especially important for stroke patients who had difficulties with swallowing. However, some stroke patients attempt to transfer to bed after meals when they were left unsupervised.

* The faller received a new, custom-fitted wheelchair the day before the fall. Previously he used a generic wheelchair that he was given at admission but did not fit him well and caused his feet to hang off the footrest. Because the faller was unfamiliar with the new wheelchair, he was unable to properly lock it when he attempted to transfer to his bed. The lack of familiarity with the new wheelchair contributed to this fall.
* Upon admission to the stroke rehabilitation unit, patients were given generic wheelchairs from a pool of available wheelchairs in the unit. Prescription of a customized wheelchair was done on a case-by-case basis. Not all patients admitted to the unit received a customized wheelchair because it was anticipated that some would not require a wheelchair when they left the unit. The OT, in conjunction and collaboration with the PT were responsible for fitting a wheelchair to a patient. Rehab and long-term goals were discussed and if a wheelchair was deemed necessary for the long-term then a customized wheelchair was prescribed. In this case, the faller was not prescribed a wheelchair until it was deemed by the health care team that he would require the use of a wheelchair after discharge from the rehabilitation hospital. It took 45 days for the faller to receive his new wheelchair.

* The faller lacked insight into his disability. He was unaware of the level of disability and suffered from poor memory and judgment. He had difficulty with memory and extrapolating new information. Although he was repeatedly instructed to use the call bell and to call for assistance with transfers, he chose not to, he stated that he did not want to bother the nurses and that he was embarrassed by his disability. He also overestimated his ability to move and transfer independently because he was in a new, better fitting wheelchair. Since the faller had difficulty remembering instructions, standard practice of repeating instructions was not sufficient for patients who suffer from cognitive impairments.

* The faller had only started to eat solid foods by mouth the day before the fall. It was an experience that he had to adjust to again. He was in a bad mood the day of the fall and generally did not like to socialize with other patients. These factors led the faller to leave the dining hall sooner than the other patients. Because other patients were still eating, the three RNs in the unit at lunch time had to remain in the dining hall and assist them and could not supervise the faller.

* When the faller’s regular RN left for lunch, she did not inform the covering RN that the faller did not tolerate sitting in his wheelchair for more than 20 minutes.

* During lunch time, two RNs were on lunch break while three RNs stayed in the unit. On the day of the fall the unit was short staffed with only five RNs in the unit instead of the usual seven.

* When staffing levels in the unit were low, every effort was made to find a replacement registered nurse. However, if this is unsuccessful then the next step is to rely on a “different skill mix” where a registered practical nurse (RPN) or a personal care provider (PCP) were brought in in lieu of a nurse. Since a RN had a greater scope of practice than an RPN or PCP, the tasks that can be performed by the replacements were limited and any additional work that was only allowed to be completed by a RN was offloaded to the available RNs. If a “different skill mix” was not feasible, then the case load of the absent RN was re-distributed to the available staff. This caused an increase in the workload for the RNs in the unit and an undesirable option but at times inevitable.
Faller refuses to participate in physiotherapy session. 10:30

- Faller is depressed.
- Faller has no motivation to recover.
- Faller is not cooperative with rehabilitation team.
- Faller is unaware of the level of his disability.

Faller eats lunch in dining hall with assistance from RN. 12:00-12:20

- Faller continues to lie in bed watching tv. 10:30-11:30

Faller has OT session in his room. 11:30-12:00

- Faller returns to room. 12:25

Faller's RN goes for her lunch break. 12:30

- There is a shortage of nursing staff in unit today, usually 7 RNs in unit, today there are only 5.
- When two RNs go on lunch break, only three RNs are on the unit.
- Three RNs are assisting other patients with meals in the dining hall.
- Covering RN is unaware that faller does not tolerate sitting in wheelchair for more than 20 minutes.

Faller prefers to be in his room.

- Faller does not like socializing.

Faller is in a bad mood today.

- Faller started eating solid food two days ago when feeding tube was removed.

Faller is unsupervised while he transfers to his room.
Case 16433: Sequence of Events

1. Faller sits in wheelchair watching tv. 12:25-12:57
   - Faller can tolerate sitting in his wheelchair for a maximum of 20 minutes.
2. Faller decides to transfer to bed on his own. 12:57
   - Faller does not call covering RN for help because he does not want to bother her.
   - Faller is embarrassed about his disabilities.
   - Faller ignores the call bell close to him.
3. Faller moves wheelchair so it is parallel to bed. 12:58
4. Faller attempts to lock the wheelchair breaks. 12:58
   - Faller is too weak to properly lock the wheelchair breaks.
   - Faller suffered a subarachnoid hemorrhage and intraventricular hemorrhage 16 weeks ago.
   - Faller is on five prescription medications.
   - Faller is not fully familiar with new custom-fitted wheelchair.
   - The custom-fitted wheelchair is new, faller received it yesterday.

https://secure.empowerhealthresearch.ca/report/soe
Faller scoots forward to the edge of the wheelchair, 12:59.

Faller attempts to transfer to bed by putting his left hand on mattress, 12:59.

Faller is not strong enough to support his weight.

Faller has never transferred independently before.

Faller requires assistance from at least 2 other people for all transfers.

Faller is unsupervised while attempting a transfer.

Faller over-reaches.

Faller’s left arm gives way, 13:00.

Faller has muscle atrophy.

Faller loses his balance.

Faller lands on his right elbow and ribs under the wheelchair, 13:00.

Faller’s roommate witnesses the fall and rushes to the front desk for help, 13:00.

Three RNs in unit arrive in faller’s room and assist him to bed, 13:01.

Covering RN assesses faller for injury and finds scraped elbow, ribs and temple, 13:05.
SFIM Investigative Report

Buckled Knee Near Fall
2.1 Date of the fall: 2012-05-01
2.2 Day: Tuesday
2.3 Time of fall: 24-hour clock
   10:30
2.4 Witnesses: Witnessed
   Number of people at the scene? 1
2.5 Location of the fall: Indoors
   Public building (includes hospitals or long term care homes)
   Hospital or LTC bathroom
2.6 Activity at the time of the fall:
   Toileting
2.6a Was this person multi-tasking? No
2.7 Action by the faller prior to loss of balance:
   Rising out of bed, chair, toilet, bath
2.8 Type of fall:
   Other, please specify:
   Knee buckled.
2.9 Direction of the fall:
   Back
2.10 Environment at the fall location:

✓ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

✓ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

✓ Shoes

2.13 How did faller get up after the fall?

☐ Assisted by another person

✓ Nurse/Other staff

Please specify how the faller was assisted:

✓ Manual Aide (e.g. cane/walker/wheelchair)

✓ Manual lift (no aide by device)

2.14 Injury? ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

First time RN was taking care of faller.
SFIM
Case ID: 2200312 Date: 2013-06-06 Subject #: 16767

Information About the Faller

3.1. Demographics:
Year of birth: 1950/04/02 Age Calculated: 62
Gender: Male
Population (Check all that apply): Senior
✓ Acquired brain injury
✓ Stroke survivor

3.2 Falls history:
○ Rare faller (fell only this one time in the past year)

3.4 Marital status:
○ Single

3.5 Mental status:
✓ Normal, alert and oriented
✓ Other, please specify:
Alert but inconsistently follows commands.

3.6 MMSE score:
27

3.7 Education:
○ Unknown

3.8 Mobility aids:
✓ Assistance by another person ○ All of the time
✓ Wheelchair ○ All of the time

3.9 Other aids used by the faller:
✓ Bath bench/shower seat
✓ Bathroom grab bar
✓ Bed alarm
✓ Bed rails
☑ Raised toilet seat/Commode
☑ Seat belt in wheelchair
☑ Shower chair

3.10 Medical problem at the time of the fall:
☑ Acquired brain injury   ☑ Hemorrhagic
☑ Deconditioning
☑ Depression
☑ Muscle weakness

☑ Stroke Functional Independence Measure Score (Maximum score 126):  54
☑ Montreal Cognitive Assessment Score (Maximum score 30):  24
☑ Montreal Cognitive Impairment Score (MoCA < 26):
☑ Yes

☑ Other, please specify:
Thyroid cancer, changes in hearing and vision

3.11 Medications:

13 Number of prescription medications used by the faller on the day of the fall

Medication Name:
Colace 100 mg
Medication Name:
Lactulose 15 to 30 mL
Medication Name:
Perindopril 4 mg
Medication Name:
Potassium chloride 600 mg
Medication Name:
Trazadone 100 mg
Medication Name:
Nitroglycerin spray
Medication Name:
Anusol Hydrocortisone ointment
Medication Name:
Multivitamins with minerals
Medication Name:
Vitamin D 2000 units
Medication Name:
Vitamin B12 250 mcg
Medication Name:
Ferrous gluconate 300 mg
Medication Name:
Tylenol
Gravol

0  Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 62 year old gentleman, experienced a fall in the washroom of a rehabilitation hospital on May 1, 2012 at approximately 10:30. On January 12, 2012, the faller’s elderly mother found the faller at home, in his own vomit, urine and feces. He was confused and hemiplegic on the left side. He was complaining of a headache and was mumbling and confused. He was admitted to the acute care hospital where he was diagnosed with right thalamic hemorrhage and intraventricular hemorrhage secondary to hypertension. He was discharged to a stroke rehabilitation unit on February 29, 2012. The faller continued to make gains with his therapies while at the stroke rehabilitation unit and was ready to be discharged on April 20, 2012. Because he was not at the functional level to return to independent living, he was referred to a long-term care facility within the city. He was awaiting placement from April 20-May 3 (date of discharge from rehabilitation hospital). On May 1, 2012 the faller had a normal morning of OT dressing and grooming session, followed by a shower with the assistance of the PCP. After his shower the faller sat in his wheelchair with the half lap tray in place and read the newspaper. At around 10:25 the faller felt the urge to urinate and informed an RN who had just come by to check up on him. The RN checked the faller’s transfer status chart posted above his bed and noticed that he required assistance from one person for transfers. She pushed his wheelchair into the washroom and parked it next to the toilet. She put on the brakes and helped the faller stand up. With cuing from the RN, the faller grabbed onto the RN’s right hand as she helped him sit on top of the raised toilet seat/commode. After he finished urinating, the faller stood up by grabbing onto the grab bars in front of him using his right hand. Once standing, the faller briefly let go of the grab bars in order to straighten up, but suddenly his right knee buckled and the faller lost balance. He quickly grabbed onto the grab bars in front of him again and at the same time the RN swiftly pushed the wheelchair under the faller to catch him before hitting the ground. The faller landed on the wheelchair and the RN helped him readjust his clothing. The RN then pushed his wheelchair back to his bedside and assessed him for injuries. She made changes to the transfer chart posted above his bed, noting that the faller required assistance from two people, not just one person.

The faller
The faller was a 62 year old gentleman who, prior to experiencing a stroke, worked as a landscaper. The faller made slow, but steady gains in rehabilitation. However, he was still restricted to a wheelchair and needed assistance with most activities of daily living. The faller had confabulations (a plausible but imagined memory that fills in gaps in what is remembered) in terms of what he was able to physically do. He also suffered from language deficits with non-sense communication, but he was able to communicate his needs. The faller suffered from severe left side neglect and some decreased memory and problem solving. He was impulsive, lacked insight into his disability, was easily distracted and had a near absence of all sensation except for deep pressure over the left side of his body. He had no movement in his left arm (it was flaccid). The faller tended to cross his left arm over to his right knee resulting in trunk rotation toward the right. He also had reduced weight bearing through his left iliotibial tract. He was able to transfer to a wheelchair with supervision and cuing, occasional minimal assistance when going to the weak side. Toileting was still onto a commode, but he was able to perform a moderately assisted transfer if given the right cues. He required a maximal assistance of 3 people to walk a few meters. He used a manual wheelchair to meet his daily mobility needs. He had a trial in a power chair but he was not safe due to his neglect, lack of insight and significant distractibility. He was motivated to self-propel and navigate throughout the hospital independently. However, he required reminding to protect his arm on the lap tray, and required cuing for set up in transfers (i.e. positioning, brake application, etc.). He also had difficulty negotiating doorways and obstacles due to his left neglect and distractibility. He had an open pressure wound on his left buttock and needed to be repositioned frequently to manage the back pain and increase sitting tolerance. Effort was required to focus his attention when transferring. His mobility was limited by significant hemiparesis, decreased attention and cognitive/perceptual deficits and lack of sensation. In addition to being impulsive, the faller was also unsafe in his judgments and required frequent repetition and instruction and clear expectations for behaviour as he had difficulty extrapolating new information. Perceptual deficits also included poor spatial relations. He required cuing for orienting clothes and increasing environmental awareness on the left. He had general muscle weakness, muscle wasting in his left
arm and osteoarthritis in his knees. It was very difficult for him to place any weight on his legs. A physical assessment that day also revealed that the faller had significant swelling and pressure in his left leg. However, the faller did not complain of any pain and the RN was unaware of the swelling. The faller also had a midline shift whereby his trunk tended to rotate towards the right and reduced weight bearing through his left iliotibial tract.

Family
Although he was not married and did not have any children, the faller’s sister who lived in a distant city (629 km) assisted the faller as much as she could from a distance. The faller also had uncles in the city who were supportive and helped to care for the faller’s mother. Prior to admission to hospital, the faller lived with and cared for his elderly mother at home. After his sudden admission to acute care due to stroke, his mother was placed in LTC as a crisis admission. The faller hoped that he would be able to return home, however, when that did not seem achievable due to the extent of his disabilities, he requested to be placed in the same LTC facility, to be reunited with his mother.

Nurse
The RN in charge of the faller’s care on the day of the fall was new to taking care of him and was unfamiliar with the faller’s abilities. Although she had received verbal and written information about the faller, she did not have any experience with him. She was vigilant in caring and supervising the faller and made every effort to keep him safe. She felt that the transfer status chart for the faller, posted above his bed did not accurately reflect the faller’s needs when transferring. The chart indicated that the faller only required assistance from one person when transferring but after experiencing the near fall with the faller, the RN believed that he required at least 2 people with transfers. She made this change to his transfer status chart after the near fall incident.

Transfer Chart
The transfer chart also known as the Spine Tingling Program, is a quick visual chart posted above each patient’s bed to inform health care providers of the patient’s transfer status. The patient’s mobility and transferring abilities are assessed by physiotherapists who prepare Spine Tingling Program chart. Adjustments can be made by any member of the health care team who feels that changes are needed. The size and abilities of the patient are taken into account but not the size of providers. In this case, faller was 175.3 cm tall and weighed 82 kg while the RN was approximately 160 cm tall and weighed 60 kg. If a patient is significantly taller than the caregiver, it is more difficult for the caregiver to transfer the patient independently. Even heavy patients can be transferred safely provided they have the strength to carry their own weight. However, significant differences in the height and weight of a patient and that of the care provider can compound the difficulty of transferring a patient who has hemiparesis.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

Buckled knee.jpg
IMG_1230.JPG
IMG_1231.JPG
Faller is 175.3 cm tall and weighs 81.8 kg, RN is approximately 160 cm tall and weighs 60 kg.  
Faller has confabulations in terms of what he is able to physically do.  
Faller has left hemiparesis.  
Faller has severe left neglect and near absence of all sensation except for deep pressure over the left side of his body.  
Faller has a midline shift.  
Faller has swelling and pressure in his left leg today.  
Faller is not complaining of any pain.  
Faller is easily distracted.  
Faller is impulsive.  
Faller suffered a right thalamic hemorrhage and intraventricular hemorrhage four months ago.  
Faller has arthritis in his knees.  
Faller has reduced weight bearing ability through his left iliotibial tract.  
Faller is on 13 medications.  
Faller has general muscle weakness.

RN follows the transfer chart posted above faller’s bed. 10:26  
RN assists faller onto toilet. 10:29  
The faller gets up by using grab bars with right hand. 10:30  
Faller lets go of the grab bar in order to stand straight.  
Faller’s right knee buckles. 10:30  
Faller loses balance. 10:30
Conclusions

The faller, a 62 year old gentleman, experienced a fall in the washroom of a rehabilitation hospital on May 1, 2012 at approximately 10:30. On January 12, 2012, the faller’s elderly mother found the faller at home, in his own vomit, urine and feces. He was confused and hemiplegic on the left side. He was complaining of a headache and was mumbled and confused. He was admitted to the acute care hospital where he was diagnosed with right thalamic hemorrhage and intraventricular hemorrhage secondary to hypertension. He was discharged to a stroke rehabilitation unit on February 29, 2012. The faller continued to make gains with his therapies while at the stroke rehabilitation unit and was ready to be discharged on April 20, 2012. Because he was not at the functional level to return to independent living, he was referred to a long-term care facility within the city. He was awaiting placement from April 20-May 3 (date of discharge from rehabilitation hospital). On May 1, 2012 the faller had a normal morning of OT dressing and grooming session, followed by a shower with the assistance of the PCP. After his shower the faller sat in his wheelchair with the half lap tray in place and read the newspaper. At around 10:25 the faller felt the urge to urinate and informed an RN who had just come by to check up on him. The RN checked the faller’s transfer status chart posted above his bed and noticed that he required assistance from one person for transfers. She pushed his wheelchair into the washroom and parked it next to the toilet. She put on the brakes and helped the faller stand up. With cuing from the RN, the faller grabbed onto the RN’s right hand as she helped him sit on top of the raised toilet seat/commode. After he finished urinating, the faller stood up by grabbing onto the grab bars in front of him using his right hand. Once standing, the faller briefly let go of the grab bars in order to straighten up, but suddenly his right knee buckled and the faller lost balance. He quickly grabbed onto the grab bars in front of him again and at the same time the RN swiftly pushed the wheelchair under the faller to catch him before hitting the ground. The faller landed on the wheelchair and the RN helped him readjust his clothing. The RN then pushed his wheelchair back to his bedside and assessed him for injuries. She made changes to the transfer chart posted above his bed, noting that the faller required assistance from two people, not just one person.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller suffered from left hemiparesis, severe left sided neglect and a near absence of all sensation except for deep pressure over the left side of his body. He was easily distracted, impulsive and had difficulty with memory. He required constant cuing to perform simple tasks. He had difficulties with speech but was able to communicate his needs. Although he was very motivated to regain his abilities and participate in therapies, he lacked insight into his disabilities and required assistance with most ADLs.

* He had general muscle weakness, muscle wasting in his left arm and osteoarthritis in his knees. It was very difficult for him to place any weight on his legs and therefore his right knee buckled when he tried to stand up from the toilet. A physical assessment that day also revealed that the faller had significant swelling and pressure in his left leg. However, the faller did not complain of pain that day and the RN was unaware of the swelling. The swelling and pressure in his left leg could have also contributed to the buckling of his right knee. The faller also had a midline shift whereby his trunk tended to rotate towards the right and reduced weight bearing through his left iliobial tract. This may have contributed to increased weight bearing on the right side of his body, leading to a buckled knee.

* The RN in charge of the faller’s care the day of the fall was new to taking care of him and was unfamiliar with the faller’s abilities. Although she had received verbal and written information about the faller she did not have any experience with him. She was vigilant in caring and supervising the faller and made every effort to keep him safe. She felt that the transfer status chart for the faller, posted above his bed did not accurately reflect the faller’s needs when transferring. The chart indicated that the faller only required assistance from one person when transferring but after experiencing the near fall with the faller, the RN believed that he required at least 2 people with transfers.

* The standard practice in the unit was that patient’s mobility and transferring abilities were assessed by physiotherapists who prepared the Spine Tingling Program chart. Adjustments can be made by any member of the
health care team who feels that changes are needed. The size and abilities of the patient are taken into account but not the size of providers. In this case, faller was 175.3 cm tall and weighed 82 kg while the RN was approximately 160 cm tall and weighed 60 kg. If a patient is significantly taller than the caregiver, it is more difficult for the caregiver to transfer the patient independently. Even heavy patients can be transferred safely provided they have the strength to carry their own weight. However, significant differences in the height and weight of a patient and that of the care provider can compound the difficulty of transferring a patient who has hemiparesis. In this case, the faller was 175.3 cm tall and weighed 81.8 kg while the RN was approximately 160 cm tall and weighed 60 kg.
Faller is admitted to emergency room for right thalamic hemorrhage and intraventricular hemorrhage, Jan 12, 2012

Faller has intraventricular catheter (IVC) filter inserted, Jan 26, 2012

Faller’s IVC is removed, Feb 17, 2012

Faller is admitted to rehabilitation hospital, Feb 29, 2012

Faller makes good gains with his therapies at rehabilitation hospital, Feb 29-April 20, 2012

Faller is ready for discharge to LTC but is awaiting placement, April 20-May 1, 2012

Faller has dressing and grooming session with OT, May 1, 2012, 9:00

Faller is taken to the shower by Patient Care Provider (PCP), 9:30

Faller is assisted with a shower by the PCP, 9:30 -9:45

Faller is brought back to his room by PCP, 9:45

Faller sits in his wheelchair with lap tray, 9:46

Faller reads the newspaper, 9:46 - 10:25

Faller has the urge to urinate, 10:25

RN, newly assigned to faller, comes into the room to check on him, 10:26

Faller tells the RN that he needs to go to the washroom, 10:26

RN follows the transfer chart posted above faller’s bed, 10:26

RN wheels faller to washroom with the wheelchair, 10:27

RN parks faller's wheelchair next to toilet, 10:28

RN locks the breaks of the wheelchair, 10:28

RN helps faller onto commode frame that rests on top of the toilet, 10:28

Faller is 175.3 cm tall and weighs 81.8 kg, RN is approximately 160 cm tall and weighs 60 kg.

Transfer chart is based on size and abilities of patients.

Transfer chart does not take into account the size of care providers.

Faller has confabulations in terms of what he is able to physically do.
Faller has swelling and pressure in his left leg.

Swelling in Faller’s left leg.

Faller is complaining of any pain.

Faller is impulsive.

Faller suffered a right thalamic hemorrhage and intraventricular hemorrhage four months ago.

Faller has reduced weight bearing ability through his left iliobial tract.

Faller has arthritis in his knees.

Faller has severe left neglect and near absence of all sensation except for deep pressure over the left side of his body.

Faller has left hemiparesis.

This is the first time the RN is caring for this patient.

Faller has midline shift.

Faller is on 13 medications.

Faller’s right knee buckles. 10:30

Faller loses balance. 10:30

Faller quickly grabs onto grab bars with right hand. 10:30

The faller gets up by using grab bars with right hand. 10:30

Faller has swelling and pressure in his left leg today.

RN is unaware of swelling in faller’s left leg.

Faller is not complaining of any pain.

Faller quickly grabs onto grab bars in order to stand straight.

Faller is distracted.

Faller is impulsive.

RN quickly pushes wheelchair under Faller to catch him from hitting the ground. 10:30

RN quickly pushes wheelchair under Faller to catch him from hitting the ground. 10:30

Faller lands on wheelchair. 10:30

RN helps Faller readjust his clothing. 10:31

RN pushes wheelchair back to Faller’s bedside. 10:32
RN assesses faller for injuries. 10:32

RN reassesses and changes faller's transfer status from one person to two people assistance. 10:40
SFIM Investigative Report

PCP Transfer Both on Floor
SFIM
Case ID: 2200412  Date: 2013-06-06  Subject #: 16777

2.1 Date of the fall: 2012-06-09
2.2 Day: Saturday

2.3 Time of fall: 24-hour clock
   19:30

2.4 Witnesses: Witnessed
   Number of people at the scene? 2

2.5 Location of the fall: Indoor
   Public building (includes hospitals or long term care homes)
   Hospital or LTC room

2.6 Activity at the time of the fall:
   Standing on both feet

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
   ✔ Quickly getting up from a chair or a bed
   ✔ Rising out of bed, chair, toilet, bath
   ✔ Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:
   ✔ Loss of support

2.9 Direction of the fall:
2.10 Environment at the fall location:

☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

☑ Shoes

2.13 How did faller get up after the fall?

☑ Assisted by another person

☑ Nurse/Other staff

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☑ Yes

2.15 Injury severity:

☑ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☑ Pain

2.17 Injury location:

☑ Arm, elbow ☐ Left
2.18 Type of medical attention received:

☑ Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

PCP assisting faller with transfer is new to taking care of him.
3.1. Demographics:

Year of birth: 1958  Age Calculated: 54
Gender: Male
Population (Check all that apply):  ✓ Acquired brain injury
  ✓ Stroke survivor

3.2 Falls history:
  • Occasional falter (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency
   Number of falls in the last week: 1
   Number of falls in the last month: 4
   Number of falls in the last year: 4

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):
   ✓ Unknown

3.4 Marital status:
  • Married

3.5 Mental status:
   ✓ Normal, alert and oriented
   ✓ Depressed

3.6 MMSE score:
   ✓ Not available

3.7 Education:
   • College or equivalent completed

3.8 Mobility aids:
Montreal Cognitive Impairment Score (MoCA < 26): Yes

Other, please specify: Multiple Sclerosis.

3.11 Medications:

9 Number of prescription medications used by the faller on the day of the fall

Medication Name: Celecoxib 100mg
Medication Name: Citalopram 20mg
Medication Name: Dalteparin 5000 unit/0.2mg
Medication Name: Docusate Sodium 100mg
Medication Name: Interferon 44mcg
Medication Name:
<table>
<thead>
<tr>
<th>Medication Name</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoprolol 25mg</td>
<td></td>
</tr>
<tr>
<td>Perindopril 8mg</td>
<td></td>
</tr>
<tr>
<td>Ranitidine 150mg</td>
<td></td>
</tr>
<tr>
<td>Celebrex 100mg</td>
<td></td>
</tr>
</tbody>
</table>

0. Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 54 year-old stroke survivor fell on Saturday, June 9, 2012 at approximately 19:28. After a day spent with his daughter and a friend the faller decided that he wanted to go to bed. The faller was sitting in his wheelchair while his friend sat in a chair next to him in the faller’s room, next to his bed. The faller used the call bell to ask for assistance transferring back to his bed. A personal care provider (PCP) came into the room to assist the faller. The PCP had never assisted the faller before so she was unfamiliar with his abilities. She checked his transfer status chart, located above the bed, and noted that he required assistance from one person to pivot. She offered to change him into a hospital gown but he said that he preferred sleeping in his clothes. At the time of the transfer, the faller was wearing running shoes. She then positioned and locked his wheelchair in front of the left side of his bed and placed her right leg between his legs, against his weak left knee for support. She instructed him to place his hands on her shoulders and then she grabbed onto the top of his pants to lift him up. As he quickly stood up, the faller suddenly stepped forward which caused the PCP to lose her balance and subsequently lead to the faller losing his balance. The PCP tumbled backwards and fell on the floor while the faller, suffering from left-sided hemiparesis fell forward on top of the PCP and onto his left side. He hit the ground with his left elbow. The PCP managed to get up from underneath the faller and quickly positioned a pillow underneath his head while she used the call bell to call for help. Three nurses in the unit rushed to the room and assisted the faller up to his bed. They assessed him for injuries and noted that he had a sore elbow.

Faller
The faller was a 54 year old right-handed gentleman who had a sudden onset of hemiplegia on May 19, 2012. The faller was in the shower when he noticed that his left hand and later his left leg stopped working. He was taken to the emergency room of a local hospital in a small town and transferred to the regional acute care hospital for further evaluation. The faller was diagnosed with an intraparenchymal hemorrhage in his premotor gyrus with edema surrounding it. The faller was diagnosed with multiple sclerosis in 2008 and suffered from degenerative disc disease and carpal tunnel syndrome. He used to be a one pack-a-day smoker but no longer smoked. During his stay in the acute care hospital, the faller was alert and oriented but confused and restless at night. He had an eye deviation to the right with inability to look to the left. He had a left facial weakness and dense left hemiplegia and significant neglect. Prior to this fall, while at the acute care hospital, the faller experienced three other falls. The previous falls were the result of the faller trying to transfer to the washroom independently during the middle of the night, on May 29th and 30th and 31st. The faller was transferred to a rehabilitation hospital on June 6, 2012. The faller suffered from depression (indicated by a very high score on the hospital anxiety and depression scale), muscle weakness, left-sided hemiparesis, mild cognitive impairment, and back pain (due to degenerative disc disease). He required a wheelchair for mobility and needed assistance with all activities of daily living. On the day of the fall, the faller was on nine prescription medications. He lacked insight into his physical limitations, particularly with the left side. He lacked left spatial awareness and was easily distracted. He had a dense left hemiplegia with decreased sensation in both the arm and the leg by approximately 50%.

Family
The faller’s wife was a registered nurse and worked both in their hometown as well as in the regional hospital. She was very supportive and visited her husband every day after work. The faller also had extended family in town who visited often.

PCP
The PCP assisting the faller to bed the night of the fall was unfamiliar with this patient. Since the faller had only been admitted to the rehabilitation hospital three days ago, the PCP had not yet had the chance to take care of him. RNs who worked a 12-hour shift were busy with shift change and verbal patient reports from 19:00-19:30. Therefore, the PCP was responsible for transferring the faller. She had been working in the unit since 2010 and was familiar with procedures and felt confident performing her tasks. She relied on the transfer status
chart (posted above each patient’s bed) for instructions on how to transfer her patients. The faller was 15 cm taller than the PCP.

Wheelchair
The faller and his wife complained that his wheelchair was too small for him. The faller’s wife said that when the faller was being transferred from the acute care hospital to the rehabilitation hospital, his referral form had mistakenly said that the faller was 5 feet tall; the faller’s height was 5 feet, 10 inches tall. Since patients are assigned wheelchairs based on measurements sent to the hospital by the referring hospital, the faller was given a small, inappropriately fitting wheelchair. He did not like sitting in his wheelchair for long periods of time as it aggravated his lower back pain.

Communication between staff
Although the health care providers who were familiar with the faller were aware that he was a very impulsive patient, this information was not properly shared with the attending PCP prior to the transfer. After the fall, nursing staff told the PCP that indeed the faller was very impulsive and had a tendency to make very fast and unexpected movements. The PCP indicated that her approach to this patient would have been completely different if the transfer chart posted above his bed had indicated that if staff were not familiar with him then they should not transfer him alone but rather get help from one other person.

Transfer Chart
The transfer chart also known as the Spine Tingling Program, is a quick visual chart posted above each patient’s bed to inform health care providers of the patient’s transfer status. The patient’s mobility and transferring abilities are assessed by physiotherapists who prepare Spine Tingling Program chart. Adjustments can be made by any member of the health care team who feels that changes are needed. The size and abilities of the patient are taken into account but not the size of providers. In this case, faller was 178 cm tall and weighed 80 kg while the RN was approximately 160 cm tall and weighed 60 kg. If a patient is significantly taller than the caregiver, it is more difficult for the caregiver to transfer the patient independently. Even heavy patients can be transferred safely provided they have the strength to carry their own weight. However, significant differences in the height and weight of a patient and that of the care provider can compound the difficulty of transferring a patient who has hemiparesis, impulsivity and unexpected movements.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

PCP transfer both on floor 1.jpg
PCP transfer both on floor 2.jpg
PCP transfer both on floor 3.jpg
### SFIM
**Case ID: 2200412**  
**Date: 2013-06-06**  
**Subject #: 16777**

#### Swiss Cheese Report

**Organizational Factors:**
- There is a lack of communication between hospitals about impulsivity of patients and past falls history.
- Information about falls is not high priority during exchange of patient information when patients transfer between hospitals.
- Information from the referring hospital incorrectly indicates that faller is 152.4 cm tall.
- Wheelchairs in rehabilitation hospital are assigned based only on information received from referring hospital.
- The falls risk assessment at the rehabilitation hospital does not capture impulsivity as a cognitive risk factor.
- There is a disconnect in the hospital policy where impulsivity is listed as a contributing factor in post-fall review, but not in falls risk assessment.

**Supervision:**
- Communication between staff about faller’s height and impulsive behaviour is inadequate.
- RNs who work a 12-hour shift are occupied with verbal patient reports during evening shift change.
- Faller’s transfer status does not indicate that faller makes impulsive quick movements.

**Preconditions:**
- Faller is 178 cm tall.
- Wheelchair is too small for the faller.
- Prolonged sitting in wheelchair aggravates faller’s back pain.
- Faller suffers from degenerative disc disease.
- Faller spent all day in wheelchair with family members who visited.
- Faller is fatigued.
- Faller is on nine medications.
- Faller suffers from lower back pain.
- It is the first time that this PCP is helping faller.
- PCP is unaware that faller is taller than 152.4 cm.
- PCP is unaware of faller’s impulsive behaviour.
- Faller is extremely impulsive.
- Faller ignores instructions given to him by PCP to stand still while she better grips his waist in order to pivot to bed.
- Faller suffered a intraparenchymal hemorrhage 3 weeks ago.
- Faller does not have complete control of his trunk and makes jerky movements.
- Faller is 15 cm taller than PCP.
- Faller has complete paralysis of left side.

**Unsafe Acts:**
- Discharge team at acute care hospital transfers faller to stroke unit at rehabilitation hospital without communicating falls history. Jun 6, 2012
- OT assigns a wheelchair that is too small for the faller.
<table>
<thead>
<tr>
<th>Event Description</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faller decides to go to his bed.</td>
<td>19:21</td>
</tr>
<tr>
<td>Patient Care Provider (PCP) comes into the room to help the faller.</td>
<td>19:25</td>
</tr>
<tr>
<td>PCP follows directives from the transfer status chart above the faller's bed.</td>
<td>19:25</td>
</tr>
<tr>
<td>Faller stands up too quickly.</td>
<td>19:27</td>
</tr>
<tr>
<td>PCP loses balance.</td>
<td>19:28</td>
</tr>
</tbody>
</table>
Conclusions

The faller, a 54 year-old stroke survivor fell on Saturday, June 9, 2012 at approximately 19:28. After a day spent with his daughter and a friend the faller decided that he wanted to go to bed. The faller was sitting in his wheelchair while his friend sat in a chair next to him in the faller’s room, next to his bed. The faller used the call bell to ask for assistance transferring back to his bed. A personal care provider (PCP) came into the room to assist the faller. The PCP had never assisted the faller before so she was unfamiliar with his abilities. She checked his transfer status chart, located above the bed, and noted that he required assistance from one person to pivot. She offered to change him into a hospital gown but he said that he preferred sleeping in his clothes. At the time of the transfer, the faller was wearing running shoes. She then positioned and locked his wheelchair in front of the left side of his bed and placed her right leg between his legs, against his weak left knee for support. She instructed him to place his hands on her shoulders and then she grabbed onto the top of his pants to lift him up. As he quickly stood up, the faller suddenly stepped forward which caused the PCP to lose her balance and subsequently lead to the faller losing his balance. The PCP tumbled backwards and fell on the floor while the faller, suffering from left-sided hemiparesis fell forward on top of the PCP and onto his left side. He hit the ground with his left elbow. The PCP managed to get up from underneath the faller and quickly positioned a pillow underneath his head while she used the call bell to call for help. Three nurses in the unit rushed to the room and assisted the faller up to his bed. They assessed him for injuries and noted that he had a sore elbow.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller suffered from depression (indicated by a very high score on the hospital anxiety and depression scale), muscle weakness, left-sided hemiparesis, mild cognitive impairment, and back pain (due to degenerative disc disease). He required a wheelchair for mobility and needed assistance with all activities of daily living. On the day of the fall, the faller was on nine prescription medications. He lacked insight into his physical limitations, particularly with the left side. He lacked left spatial awareness and was easily distracted. He had a dense left hemiplegia with decreased sensation in both the arm and the leg by approximately 50%.

* The PCP assisting the faller to bed the night of the fall was unfamiliar with this patient. Since the faller had only been admitted to the rehabilitation hospital three days ago, the PCP had not yet had the chance to take care of him. RNs who worked a 12-hour shift were busy with shift change and verbal patient reports from 19:00-19:30. Therefore, the PCP alone was responsible for transferring the faller.

* Although the PCP had been working in the unit since 2010 and was familiar with procedures and felt confident performing her tasks, she was not familiar with the faller and relied on the transfer status chart (posted above each patient’s bed) for instructions on how to transfer him.

* The transfer chart also known as the Spine Tingling Program, is a quick visual chart posted above each patient’s bed to inform health care providers of the patient’s transfer status. The patient’s mobility and transferring abilities are assessed by physiotherapists who prepare Spine Tingling Program chart. Adjustments can be made by any member of the health care team who feels that changes are needed. The size and abilities of the patient are taken into account but not the size of providers when creating these charts.

* The faller was 15 cm taller than the PCP but due to an error in the faller’s chart, the PCP was not aware of this. This made transfer of the patient more difficult for the PCP.
* The faller and his wife complained that wheelchair assigned to him upon admission was too small. The faller’s wife said that when the faller was being transferred from the acute care hospital to the rehabilitation hospital, his referral form had mistakenly said that the faller was 5 feet tall (152.4 cm); the faller’s height was 5 feet, 10 inches (178 cm). Since patients are assigned wheelchairs by OTs based on measurements sent by the referring hospital, the faller was given a small, inappropriately fitting wheelchair. He did not like sitting in his wheelchair for long periods of time as it aggravated his lower back pain.

* Although the health care providers who were familiar with the faller were aware that he was a very impulsive patient, this information was not properly shared with the attending PCP prior to the transfer. After the fall, nursing staff told the PCP that indeed the faller was very impulsive and had a tendency to make very fast and unexpected movements. The PCP indicated that her approach to this patient would have been completely different if the transfer chart posted above his bed had indicated that if staff were not familiar with him then they should not transfer him alone but rather get help from one other person.

* Information about the faller (i.e., his impulsive behaviour or unexpected fast movements) was not communicated to members of the team who were new to the faller.

* During shift change, RNs are busy with verbal patient reports and so levels of supervision and numbers of staff assisting patients are reduced.

* Information regarding patient’s past falls history or impulsive behaviour is not communicated from acute care to rehab hospital.

* Falls history and patient safety are not given high priority amongst health care teams in hospitals and falls prevention is not tailored to each patient. The falls risk assessment does not capture impulsivity as a cognitive risk factor. Even though the faller was at risk for falls, the fall prevention strategies that he received were no different than the universal falls prevention strategies applied to every patient. There is a disconnect in the organizational policy where impulsivity is often cited as a contributing factor in the post-fall review (completed by health care team) but is not captured as a risk factor in the falls risk assessment.
Faller experiences 3 falls during his stay at acute care hospital. May 29-31, 2012

Faller is taken to the ER when he is suddenly unable to move his left hand or leg. May 19, 2012

Discharge team at acute care hospital transfers faller to stroke unit at rehabilitation hospital without communicating falls history. Jun 6, 2012

There is a lack of communication between hospitals about impulsivity of patients and past falls history.

Information about falls is not high priority during exchange of patient information when patients transfer between hospitals.

Faller is 175 cm tall.

Wheelchairs in rehabilitation hospital are assigned based only on information received from referring hospital.

Wheelchair is too small for the faller.

Prolonged sitting in wheelchair aggravates faller’s back pain.

Faller suffers from degenerative disc disease.

Faller is diagnosed with intraparenchymal hemorrhage. May 19, 2012

OT assigns a wheelchair that is too small for the faller. Jun 9, 2012, 19:20

Faller is sitting on his wheelchair visiting with a friend.

Faller has cerebral angiogram surgery. May 22, 2012

Faller decides to go to his bed, 19:21

Faller spent all day in wheelchair with family members who visited.

Faller is fatigued.

Faller is on nine medications.

Faller suffers from lower back pain.
Faller uses call bell to call for assistance to go to bed. 19:21

Patient Care Provider (PCP) comes into the room to help the faller. 19:25

PCP follows directives from the transfer status chart above the faller’s bed. 19:26

PCP moves the wheelchair with faller closer to the bed. 19:25

It is the first time that this PCP is helping faller.

Faller’s transfer status does not indicate that faller makes impulsive quick movements.

Communication between staff about faller’s height and impulsive behaviour is inadequate.

PCP is unaware that faller is taller than 152.4 cm.

PCP is unaware of faller’s impulsive behaviour.

RNs who work a 12-hour shift are occupied with verbal patient reports during evening shift change.

PCP pulls the curtain around the faller’s bed. 19:25

PCP puts one foot between the faller’s feet. 19:26

PCP grabs onto faller’s belt to pull him up into standing position. 19:27

PCP tells the faller to be ready to stand up. 19:27
Faller stands up too quickly. 19:27
Faller is extremely impulsive.
Faller ignores instructions given to him by PCP to stand still while she better grips his waist in order to pivot to bed.
Faller suffered a intraparenchymal hemorrhage 3 weeks ago.
Faller does not have complete control of his trunk and makes jerky movements.
The falls risk assessment at the rehabilitation hospital does not capture impulsivity as a cognitive risk factor.
There is a disconnect in the hospital policy where impulsivity is listed as a contributing factor in post-fall review, but not in falls risk assessment.

Faller takes a large step forward with right foot. 19:27
Faller is 15 cm taller than PCP.
Faller has complete paralysis of left side.
PCP loses balance. 19:28
PCP lands on her back. 19:28

PCP gets up on her own. 19:30
PCP uses the call bell to call for help. 19:30
PCP puts a pillow under the faller's head while he lies on the floor. 19:30

Faller falls on his left side over the PCP. 19:30
Three RNs come into the room. 19:31
RN assesses faller for injuries, no major injuries are found. 19:32
RNs assist faller up to the bed. 19:31

PCP lands on her back. 19:28
PCP puts a pillow under the faller's head while he lies on the floor. 19:30
SFIM Investigative Report

Leaning on Wall, Slid to Floor
Fall Information

2.1 Date of the fall: 2012-07-26
2.2 Day: Thursday

2.3 Time of fall: 24-hour clock
9:55

2.4 Witnesses: Un-witnessed

2.5 Location of the fall: Indoors

- Public building (includes hospitals or long term care homes)
- Hospital or LTC bathroom

2.6 Activity at the time of the fall:

- Toileting

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:

- Turning

2.8 Type of fall:

- Slide against a wall or an object

2.9 Direction of the fall:

- Sideways left

2.10 Environment at the fall location:
2.11 Mobility aid used at the time of the fall:

☑ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

☑ Shoes

2.13 How did faller get up after the fall?

☐ Assisted by another person

☑ Nurse/Other staff

Please specify how the faller was assisted:

☑ Manual Aide (e.g. cane/walker/wheelchair)

☑ Manual lift (no aide by device)

2.14 Injury? ☐ Yes

2.15 Injury severity:

☐ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☑ Abrasion/scrape

2.17 Injury location:

☑ Hand, wrist, fingers ☐ Left
2.18 Type of medical attention received:

☑ Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No
3.1. Demographics:

Year of birth: 1914  Age Calculated: 98
Gender: ☐ Female
Population (Check all that apply): ☑ Senior  ☑ Stroke survivor

3.2 Falls history:

☐ Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency
   Number of falls in the last week: 0
   Number of falls in the last month: 0
   Number of falls in the last year: 2

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

☑ Unknown

3.4 Marital status:

☐ Married

3.5 Mental status:

☑ Confused or disoriented

3.6 MMSE score:

15

3.7 Education:

☐ Primary school partial

3.8 Mobility aids:
3.9 Other aids used by the faller:

- Bathroom grab bar
- Bed alarm
- Chair alarm
- Glasses for reading
- Seat belt in wheelchair

3.10 Medical problem at the time of the fall:

- Arthritis
- Osteoarthritis
- Blood pressure (high or low)
- Heart conditions
- Muscle weakness

- Stroke Functional Independence Measure Score (Maximum score 126):
  - Not available
- Montreal Cognitive Assessment Score (Maximum score 30):
  - 8
- Montreal Cognitive Impairment Score (MoCA < 26):
  - Yes

3.11 Medications:

4 Number of prescription medications used by the faller on the day of the fall

Medication Name:
- Sodium phosphate 133 ml

Medication Name:
- Lopiuone 5-7 mg

Medication Name:
- Anaphylaxis management

Medication Name:
- Oseltamivir for prophylaxis

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller was a 98-year-old woman who sustained a right thalamic hemorrhage due to hypertension. She also had diabetes and osteoarthritis. Following her stroke, the faller was very impulsive and displayed significant confusion. The day of the fall, the chair alarm system on the faller’s wheelchair had malfunctioned. The nurse went off the unit to have the wheelchair alarm replaced. While the nurse was gone, the faller had the urge to urinate. She wheeled herself into the washroom and locked her wheelchair in front of the toilet. The faller stood up and held onto the grab bar for balance. She then pivoted to position herself over the toilet. She lost her balance while attempting to straighten herself and fell against the bathroom wall. The faller landed on the toilet and scraped her left shoulder against the wall. A nurse and PCP heard the noise and came to assist the faller.

The Faller
The faller was a 97-year-old lady who sustained a stroke due to hypertension. Before the stroke, the hypertension was not being treated. The faller also had osteoarthritis and was diagnosed with diabetes and a urinary tract infection upon admission to the rehabilitation hospital. Following her stroke, the faller experienced significant confusion and demonstrated extremely impulsive behavior. She also has some left-sided weakness and left-sided visual neglect. The faller was assessed as “at risk” for falls upon admission to the hospital, and had demonstrated significant confusion and difficulty following instructions. Upon her admission to the rehabilitation hospital, she had been progressing well with physical and occupational therapies. She had short-term memory impairment, and had difficulty following verbal instructions from nurses and staff. She received repetitive verbal instructions to use the call bell and to not transfer independently, but had difficulty following these instructions and frequently attempted independent transfers. When asked why she did not use the call bell, the faller stated that she did not like to bother the nurses.

Safety Equipment
Chair alarm and bed alarm are two safety equipment systems frequently assigned for patients who were assessed as “at risk” for falls upon admission to the rehabilitation hospital. Other safety equipment options include regular seatbelts (which patients can undo themselves), pin-lock and reverse seatbelts (which cannot be undone by the patient themselves), wandering bracelets (which alert staff when a patient wanders out of the unit), and restraints (which are only used as a last resort). The bed alarm was applied to the faller’s bed on the day of admission. The chair alarm system was applied six weeks later, after several incidents where the faller attempted to transfer independently and did not respond to verbal instructions from staff that it was unsafe to get out of bed or her wheelchair on her own. After an incident where the RN found the faller attempting to transfer independently from wheelchair to bed (three months prior to this investigation), the RN left a note for the OT to consider installing a reverse seatbelt on the faller’s chair that she cannot undo. This suggestion was not implemented. This decision was related in large part to the faller’s pending application to a Long Term Care (LTC) facility.

Application to Long Term Care
At the time of this investigation, the faller had completed an application to be transferred to a LTC facility. She was still at the rehabilitation hospital because waiting lists for LTC were very long, and the faller was waiting for a spot to become available. One of the reasons why she was not restrained after her repeated attempts to transfer independently was because most LTC facilities have policies that they will not accept patients who require restraints. In this case, the faller’s stay in the rehabilitation hospital had already been much longer than it needed to be. The use of restraints (specifically a reverse seatbelt) would have jeopardized the faller’s chances of being admitted to a LTC facility and would have prolonged her stay in the hospital.

Chair Alarm System
The day of the fall, the RN noticed that the chair alarm system on the faller’s wheelchair was not working. Generally, the unit has several chair alarms at the nurses’ station, so that they can be replaced within the unit as
needed. However, on this day, there were no extra chair alarms available on the unit. The RN had to go downstairs to the Biomedical Engineering department in the hospital to get a replacement chair alarm.

The Environment
Other than the broken chair alarm, the environment was in good condition on the day of the fall. When the nurse left the unit, she instructed the faller to stay seated until she returned. No one else was present in the room when the fall occurred.

Supervision
The hospital staff took many steps to prevent the faller from falling, including installing a bed alarm, a chair alarm, and utilizing a seatbelt on her wheelchair. On two occasions, the faller’s nurse noted that the faller may need a more restrictive seatbelt installed on her wheelchair. On the first occasion (March 20, 2012), the faller had repeatedly unlocked her seatbelt in a single day, and the RN noted in her chart that the faller may require a lock on her seatbelt. On the second occasion (April 26, 2012), the RN found the faller attempting to transfer from wheelchair to bed. In this case, the RN wrote a note to the OT stating that the faller may require a reverse seatbelt that she cannot undo on her own. Following both of these incidents, no changes to the seatbelt was made.

On the day of the fall, the faller’s RN went downstairs to the Biomedical Engineering department in order to have the chair alarm replaced. The faller’s RN claimed that she did not remember whether or not she told the covering RN that she was leaving the unit and that her patient was left unattended, without a chair alarm. The covering RN did not recall being informed that the faller had been left unattended.

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SFIM
Case ID: 2200512
Date: 2013-06-06
Subject #: 17914

Swiss Cheese Report

Organizational Factors:

- Repetitive instructions to use call bell or to not transfer independently are ineffective with patients with severe cognitive impairment.
- Restrictive restraint devices are only used as a last resort.
- The falls prevention policy does not require use of restrictive devices following unsafe acts.
- Long term care facilities will not take patients who require restraint.
- Use of reverse seatbelt restraint may jeopardize faller’s application for long term care.
- Falls prevention strategy is ineffective in rehabilitation hospital.
- Chair alarms are taken by RNs to another unit for repairs.
- When the faller’s RN leaves unit, another RN covers for her.
- Communication between RNs in care team is inadequate.

Supervision:

- RN continues to tell faller to use call bell.
- Reverse seatbelt is not installed on faller’s wheelchair.
- Staff is unaware of patient’s activities.
- Staff only use verbal instructions to remind cognitively impaired faller to remain in wheelchair.
- Covering RN is not aware that faller was left unattended.

Preconditions:

- Faller is impulsive.
- Faller is cognitively impaired.
- Faller is particularly disoriented at night.
- Faller is on four medications.
- Faller lacks insight into her disabilities.
- Faller does not follow staff instructions well.
- Faller frequently forgets to use the call bell.
- Faller has short-term memory impairment.
- Faller is waiting to be transferred to a long term care facility.
- Faller does not use call bell to call nurse for help.
- Faller thinks nurses are busy and doesn’t want to bother them.
- Faller is incontinent.
- Faller has frequent urge to void.
- Faller has left-sided visual neglect.
- Faller has weakness on the left side of her body due to stroke.
- Faller has poor postural control.
- Faller suffered a right thalamic hemorrhage.

Unsafe Acts:

- Faller tries to climb out of bed. 00:45, Mar 17, 2012
- Faller undoes the seatbelt of her wheelchair three times in one day. Mar 20, 2012
- Faller tries to transfer herself from wheelchair to bed. Apr 26, 2012
- OT leaves regular seatbelt on the faller’s wheelchair. Apr 26, 2012
- Faller gets out of bed and into wheelchair and wheels herself to the washroom. Apr 29, 2012
- Faller attempts to get out of bed independently to go to washroom. 2:00, May 4, 2012
- Faller frequently unbuckles her seatbelt on her own.
- Faller continues to transfer herself in and out of wheelchair without using call bell to call for assistance. May 4 - Jul 26, 2012
- Faller’s RN takes the chair alarm to get it replaced. 9:45
- Faller loses balance. 9:55
Conclusions

The faller was a 97-year-old woman who sustained a right thalamic hemorrhage due to hypertension. She also had diabetes and osteoarthritis. Following her stroke, the faller was very impulsive and displayed significant confusion. The day of the fall, the chair alarm system on the faller’s wheelchair had malfunctioned. The nurse went off the unit to have the wheelchair alarm replaced. While the nurse was gone, the faller had the urge to urinate. She lost her balance while attempting to straighten herself onto the toilet and fell against the bathroom wall.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller had many preconditions that contributed to the fall. She had weakness on the left side of her body, as well as left-sided visual neglect which contributed to poor postural control. She was impulsive and confused, particularly at night. She had difficulty with short-term memory and consequently did not follow instructions well. She had a lack of insight into her abilities and was under the impression that she could perform tasks independently. She often did not use the call bell because she either forgot or did not want to disturb the nurses. She frequently had the urge to void and suffered from incontinence.

* Although the faller was confused and did not follow instructions, staff continued to instruct her to use the call bell. Instructions are constantly repeated to patients, however patients with cognitive impairment are incapable of adhering to instructions or often don’t remember what they were told. The effectiveness of this approach is questionable when dealing with cognitively impaired patients.

* After a previous incident where the RN found the faller attempting to transfer independently from wheelchair to bed, the RN left a note for the OT to consider installing a reverse seatbelt on the faller’s chair that she could not undo. This suggestion was never implemented.

* The installation of a reverse seatbelt would have jeopardized the faller’s pending application to transfer to long term care, because most long term care facilities have policies prohibiting the acceptance of patient who require restraints. As a consequence, the hospital staff chose to rely on consistent verbal messaging rather than restraint devices to ensure patient safety and prevent her from attempting to transfer independently.

* When the faller’s chair alarm malfunctioned, the RN to another unit to replace the chair alarm. During this time the covering nurse on the unit who would have filled in by the covering RN unaware that the faller was left unattended.

* Although the faller had attempted to transfer independently multiple times prior to this fall, no changes to the falls prevention strategy were made to safety devices such as installation of a reverse seatbelt or an attendant to supervise.

* Restrictive devices were used as a last resort but there was no objective measurement of what constitutes “last resort” or when a patient became eligible for these devices. It appears that patients have to experience a serious fall or injury before they were put on restrictive devices. The need for restraints was continuously and subjectively assessed by the health care team. In this case, the benefit of using a restrictive device for patient safety did not outweigh the risk of the faller being rejected for long term care which would prolong her stay in the hospital.
* When the chair alarm malfunctioned the RN took it out of the unit for repairs. The repair team in the Biomedical Engineering Department does not come to the unit to fix chair alarms.
Faller is diagnosed with diabetes on admission. Mar 4, 2012

Faller tries to climb out of bed. 00:45, Mar 17, 2012

Faller does not follow instructions well.

Faller is impulsive.

Faller is cognitively impaired.

Faller is particularly disoriented at night.

Faller is on four medications.

Faller tries to transfer herself from wheelchair to bed. Apr 26, 2012

Faller undoes the seatbelt of her wheelchair three times in one day. Mar 20, 2012

Faller lacks insight into her disabilities.

Faller does not follow staff instructions well.

Faller is taken to emergency due to a fall. Mar 4, 2012

A CT scan shows that the faller sustained a right thalamic haemorrhage due to hypertension (192/85). Mar 4, 2012

Faller is admitted to the neurosurgery unit of an acute care hospital. Mar 4, 2012

A bed alarm is installed on the faller's bed for safety. Mar 15, 2012

Faller is transferred to rehabilitation hospital. Mar 15, 2012

Faller is assessed as at risk for falls upon admission. Mar 15, 2012

Faller frequently forgets to use the call bell.

Faller has short-term memory impairment.

Repetitive instructions to use call bell or to not transfer independently are ineffective with patients with severe cognitive impairment.

Faller begins application process to transition to long term care after discharge from hospital, with the help of social worker and Community Care Access Centre. Apr 5, 2012

RN continues to tell faller to use call bell.

Faller frequently forgets to use the call bell.

Faller has short-term memory impairment.

Repetitive instructions to use call bell or to not transfer independently are ineffective with patients with severe cognitive impairment.
Case 17914: Sequence of Events

RN requests from OT to consider installing a reverse seatbelt on the faller's wheelchair. Apr 26, 2012

OT leaves regular seatbelt on the faller's wheelchair. Apr 26, 2012

Faller gets out of bed and into wheelchair and wheels herself to the washroom. Apr 29, 2012

Chair alarm system is installed on faller's wheelchair for safety. Apr 29, 2012

Reverse seatbelt is not installed on faller's wheelchair.

Faller does not use call bell to call nurse for help.

Restrictive restraint devices are only used as a last resort.

Faller thinks nurses are busy and doesn't want to bother them.

The falls prevention policy does not require use of restrictive devices following unsafe acts.

Faller is waiting to be transferred to a long term care facility.

Long term care facilities will not take patients who require restraint.

Use of reverse seatbelt restraint may jeopardize faller's application for long term care.
RN helps the faller clean up in the washroom. 8:30

Covering RN is not aware that faller was left unattended.

Communication between RNs in care team is inadequate.

Faller attempts to get out of bed independently to go to washroom. 2:00, May 4, 2012

Faller is incontinent.

Faller has frequent urge to void.

Staff is unaware of patient's activities.

Faller reads a book in the wheelchair. 9:00 - 9:30

Faller's RN notices that the chair check alarm is not working. 9:45

Faller's RN takes the chair alarm to get it replaced. 9:45

Chair alarms are taken by RNs to another unit for repairs.

When the faller's RN leaves unit, another RN covers for her.

Covering RN is not aware that faller was left unattended.

Communication between RNs in care team is inadequate.

Faller wheels herself to the washroom. 9:50 - 9:53

Faller locks her wheelchair in front of the toilet. 9:53

Faller stands up holding onto the handrail in front of her with both her hands. 9:54

Faller turns to her right to sit on the toilet. 9:55

Faller has breakfast in her bed. 8:00, Jul 26, 2012

Faller frequently unbuckles her seatbelt on her own.

Falls prevention strategy is ineffective in rehabilitation hospital.

Staff only use verbal instructions to remind cognitively impaired faller to remain in wheelchair.

Faller has the urge to urinate. 9:50
Faller leans on the wall with her left shoulder. 9:55

Faller loses balance. 9:55

Faller has left-sided visual neglect.

Faller has weakness on the left side of her body due to stroke.

Faller has poor postural control.

Faller suffered a right thalamic hemorrhage.

PCP and covering RN come in to assist the faller upon hearing the noise. 9:57

PCP and covering RN help the faller straighten up and sit properly on toilet seat. 9:57

PCP and covering RN help the faller to clean up. 9:58

Covering RN assists the faller to her wheelchair. 9:59

Faller's RN brings the replacement chair alarm and attaches it to faller's wheelchair. 10:00

Faller lands on the toilet seat and hits her left shoulder against the wall. 9:56

Faller scrapes left hand against the wall. 9:56
SFIM Investigative Report

Left-Sided Brain Neglect, Wheelchair Transfer
Fall Information

2.1 Date of the fall: 2012-08-08
2.2 Day: Wednesday

2.3 Time of fall: 24-hour clock
15:05

2.4 Witnesses: Un-witnessed

2.5 Location of the fall:
- Indoors
- Public building (includes hospitals or long term care homes)
- Hospital or LTC room

2.6 Activity at the time of the fall:
- Other
  Attempted transfer.

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
- Reaching forward
- Rising out of bed, chair, toilet, bath
- Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:
- Slide against a wall or an object

2.9 Direction of the fall:
2.10 Environment at the fall location:

☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

☑ Shoes

2.13 How did faller get up after the fall?

☐ Assisted by another person

☑ Nurse/Other staff

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

First time faller attempted to transfer independently.
3.1. Demographics:

Year of birth: 1954  
Age Calculated: 58  
Gender: Male  
Population (Check all that apply):  
- Acquired brain injury  
- Stroke survivor

3.2 Falls history:  
- Rare faller (fell only this one time in the past year)

3.4 Marital status:  
- Married

3.5 Mental status:  
- Agitated/aggressive/combative  
- Confused or disoriented  
- Other, please specify: Mild cognitive impairment.

3.6 MMSE score:  
- 21

3.7 Education:  
- College or equivalent completed

3.8 Mobility aids:  
- Assistance by another person  
- All of the time  
- Wheelchair  
- All of the time

3.9 Other aids used by the faller:  
- Bath bench/shower seat  
- Bathroom grab bar  
- Glasses  
- For distance  
- For reading
☑ Raised toilet seat/Commode

☑ Shower chair

3.10 Medical problem at the time of the fall:

☑ Acquired brain injury  ☛ Hemorrhagic

☑ Muscle weakness

☑ Stroke Functional Independence Measure Score (Maximum score 126):

37

Montreal Cognitive Assessment Score (Maximum score 30):

14

Montreal Cognitive Impairment Score (MoCA < 26):

œ Yes

3.11 Medications:

5 Number of prescription medications used by the faller on the day of the fall

Medication Name:
Bisoprolol 5mg

Medication Name:
Dalteparin 5000 units/0.2mL

Medication Name:
Hydrochlorothiazide 25mg

Medication Name:
Pantoprazole EC 40mg

Medication Name:
Thiamine 100mg

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 58 year old gentleman fell on Wednesday, August 8, 2012 at approximately 15:05 while in a rehabilitation hospital. The faller was admitted to a stroke rehabilitation unit on July 25, 2012, following a right MCA territory stroke which occurred on July 11, 2012. On the day of the fall, the faller woke up at his usual time of 07:30 and had breakfast in bed. He participated in his usual OT session from 09:00-10:00 and had a short break from 10:00-10:30 in his room, where he sat in his wheelchair watching television. He then participated in a 30 minute PT session in the PT gym and rested in his room on his wheelchair until a porter transferred him to the dining hall for lunch at 11:40. Following lunch, the faller had a very busy afternoon of speech therapy, and more PT and OT sessions. Finally, at 15:00 the porter wheeled the faller back to his room and parked his wheelchair on the right side of the faller’s bed. Feeling tired from a busy day, the faller decided that he wanted to lie down in his bed. Without calling for assistance the faller unbuckled his wheelchair seatbelt, put his right hand on the mattress of his bed and attempted to stand up for the first time by himself. Suddenly the faller’s right arm gave out and he lost balance. He was able to quickly grab onto the side of the bed and slow down his fall. The faller landed, faced down, on the floor. A nurse, performing a procedure on a patient in the bed next to the faller, heard the commotion. Since she had the curtain drawn around the patient she was working on, she did not witness the fall but heard noise and asked the faller what had happened. She was unable to assist the faller right away since she was in the middle of a procedure so she called for help using a call bell nearby. Two RNs, who were at the nursing station conducting verbal reports on patients during shift change, came in to the room to assist the faller back to bed. They assessed him for injuries and no major injuries were found.

The faller
The faller, a 58 year old right-handed Caucasian man lived at home with his wife and 2 adult sons (ages 27 and 29). He used to work for an auto repair shop full-time before his stroke. On July 11, 2012, the faller was having dinner while watching television at home. His wife and sons (not in the room with him) heard sounds coming from the living room area and went to check on him. They found him slumped in his chair with his plate and utensils on the floor. There was obvious left-sided hemiplegia and he was slurring his speech. Thinking that they would be able to get to the hospital sooner, they drove him to the ER at a local hospital. The physicians diagnosed stroke and since he was still within the thrombolytic treatment window (within 3 hours of symptom onset when administration of the tissue plasminogen activator can improve neurological and functional outcome in stroke patients) he was transferred to a regional acute care hospital in a nearby city (study hospital) by ambulance. He suffered a right MCA stroke due to occlusion of the right internal carotid artery by thrombosis secondary to underlying atherosclerosis. This left him with left hemiparesis, left visual inattention and some difficulties with dysphasia and dysarthria. Further examination revealed that the faller had previously suffered from multiple small strokes. Several risk factors for his strokes were identified including, excessive drinking (8-12 bottles of beer per day for last 10-15 years), smoking (1.5 packs of cigarettes per day for 41 years), hypercalcemia and hypertension. The faller’s mother, who was 80 years old, had 2 previous strokes, the first when she was 35 and the second when she was in her 70s. His father died in a car accident at the age of 54 due to a myocardial infarction while driving. The faller also complained of heart palpitations when he exerted himself. Upon diagnosis, the faller was referred back to his home hospital where stayed there July 11, 2012 until July 25, 2012. He was transferred to the rehabilitation hospital on July 25, 2012 for inpatient stroke rehabilitation therapy.

At the time of the fall, the faller was experiencing severe left hemiparesis with a flaccid left arm, left visual inattention, dysplagia, inattention, lack of insight, perceptual deficits and occasional confused, disorientation and agitation.

The faller was assessed as “at risk” for falls on admission to the rehabilitation hospital with Schmid Score of 4. He was found leaving the unit twice before so a wandering alert bracelet was placed on his wheelchair.

Family
The faller lived with his wife and 2 adult sons. His family was very supportive and visited him often while he was in
the hospital. His wife worked full-time but took some time off to be with her husband. However, due to limited financial resources she had to go back to work. Because the faller was a very active man, and due to his lack of insight, he often talked about returning back to work, unaware that he would not be able to. It was very difficult for him to be in a wheelchair and inactive. The faller’s wife felt that if the issue of not returning back to work was discussed with her husband he would “give up” and therefore the issue was not addressed with him.

Nursing
According to the post-fall review, contributing factors that lead to the fall included not using the call bell to call for help and the faller “being stubborn” and not following instructions. At the time of the fall, nursing staff were taking part in shift change and the faller’s day nurse who had been with him from 07:00-15:00 was leaving for the day. When she heard that he had fell, she came into the room to check on him. During the afternoon shift change at 15:00, day shift RNs who work an eight hour shift leave while night shift RNs who work from 15:00-23:00 begin their shift. At this time, these RNs take part in a verbal report of patients and thus there is a drop in the level of supervision in the unit.

The faller was repeatedly instructed to use the call bell when he wanted to transfer and that he should not attempt independent transfers. This was the first time the faller attempted to transfer independently. It is unclear if he understood or remembered instructions given to him since he suffered from cognitive impairment/confusion. Although nursing staff knew that the faller was very impulsive, a pinlock or chair alarm was not installed on faller’s seatbelt. He was able to unbuckle his seatbelt by himself.

It is standard practice in the unit to keep patients “active”, that is, patients are encouraged to sit in their wheelchairs as opposed to lying in bed. The time that a patient sits in his/her wheelchair is gradually increased to increase the tolerance for sitting in the wheelchair. Lying in bed for long periods of time is discouraged as it can lead to muscle atrophy and is disadvantageous to rehabilitation.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

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SFIM
Case ID: 2200612  Date: 2013-06-06  Subject #: 17915

Swiss Cheese Report

Organizational Factors:
- RN shift change practice removes faller’s RN from his care for 30 minutes.
- Practice of keeping patients sitting in wheelchair after therapy sessions is tiring for the patients.
- Standard practice in unit is to repeat instructions to cognitively impaired patients.

Supervision:
- Faller is left unattended in the room.
- At shift change (15:00) RNs are busy conducting verbal reports at the nursing station.
- A pinlock or chair alarm was not installed on faller’s wheelchair.
- Faller is unsupervised while transferring.

Preconditions:
- Faller does not tolerate sitting in wheelchair for too long.
- Faller is fatigued after multiple therapy sessions.
- Faller has lack of insight into his disabilities.
- Faller is cognitively impaired.
- Faller is on five medications.
- Faller doesn't follow staff’s instructions to use call bell for transfers.
- Faller has impaired coordination.
- Faller feels the need to rush because he is disoriented and agitated.
- Left-sided neglect makes faller extremely impulsive.
- Faller suffered a right MCA stroke four weeks ago.
- Faller needs at least 2 people assisting him with all transfers.
- Faller has difficulty with postural control.
- Faller’s right arm and leg are unable to carry his weight.
- Faller has general muscle weakness due to stroke.
- Faller has left side hemiparesis caused by stroke.
- Faller has balance difficulties.
- Faller is too weak to recover from loss of balance.

Unsafe Acts:
- Faller is left sitting in his wheelchair next to left side of the bed, facing the foot of the bed. 15:00
- Faller unbuckles wheelchair seat belt. 15:00
- Faller puts his right hand on side of the bed. 15:01
- This was the first time the faller attempted to transfer independently.
- Faller stands up to transfer from wheelchair to bed. 15:02
- Faller's right arm gives out. 15:03
- Faller grabs onto the bed as he slides down. 15:04
The faller, a 58-year-old gentleman fell on Wednesday, August 8, 2012 at approximately 15:05 while in a rehabilitation hospital. The faller was admitted to a stroke rehabilitation unit on July 25, 2012, following a right MCA territory stroke which occurred on July 11, 2012. On the day of the fall, the faller woke up at his usual time of 07:30 and had breakfast in bed. He participated in his usual OT session from 09:00-10:00 and had a short break from 10:00-10:30 in his room, where he sat in his wheelchair watching television. He then participated in a 30 minute PT session in the PT gym and rested in his room on his wheelchair until a porter transferred him to the dining hall for lunch at 11:40. Following lunch, the faller had a very busy afternoon of speech therapy, and more PT and OT sessions. Finally, at 15:00 the porter wheeled the faller back to his room and parked his wheelchair on the right side of the faller’s bed. Feeling tired from a busy day, the faller decided that he wanted to lie down in his bed. Without calling for assistance the faller unbuckled his wheelchair seatbelt, put his right hand on the mattress of his bed and attempted to stand up for the first time by himself. Suddenly the faller’s right arm gave out and he lost balance. He was able to quickly grab onto the side of the bed and slow down his fall. The faller landed, faced down, on the floor. A nurse, performing a procedure on a patient in the bed next to the faller, heard the commotion. Since she had the curtain drawn around the patient she was working on, she did not witness the fall but heard noise and asked the faller what had happened. She was unable to assist the faller right away since she was in the middle of a procedure so she called for help using a call bell nearby. Two RNs, who were at the nursing station conducting verbal reports on patients during shift change, came in to the room to assist the faller back to bed. They assessed him for injuries and no major injuries were found.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller had difficulty with postural control and balance. He had left sided hemiparesis, muscle weakness on his right side as well as the inability to carry any weight in his right arm or leg. He also suffered from left sided neglect and anosognosia and was extremely impulsive. He often felt the need to rush and felt uncomfortable sitting in his wheelchair for too long because he was confused, disoriented and agitated. According to a member of the health care team, patients with left-sided neglect are much more impulsive and require increased supervision as they tend to engage in unsafe acts more frequently. The faller was left sitting in his wheelchair unattended. Although his wife and sons visited him daily they did not supervise him 24 hours a day.

* He was also cognitively impaired and confused which when mixed with impulsivity and anosognosia made him a patient who was at a very high risk for falls. According to Barnett (2007), right-hemisphere stroke patients undergoing rehabilitation, have a greater chance of impulsive behavior and increasing fall risk. It is important that the staff make certain that the instructions given are fully understood, that patients do not wait too long when they have called for assistance, and that patients who continually tend to place themselves in hazardous situations are carefully supervised (Barnett, 2007). The faller attempted to leave the unit twice before and although a wandering alert bracelet was placed on his wheelchair, nothing else was done to address his impulsive behaviour. A chair alarm or pinlock for his wheelchair seatbelt were not installed, probably because he had not attempted to transfer independently before. However, the hospital practices are reactive as opposed to a proactive when it comes to preventing falls.

* Due to cognitive impairment, the faller was not able to follow or remember instructions all of the time. Although standard practice in the unit was to repeat instructions to cognitively impaired patients, the effectiveness of this method was questionable. When a patient is judged to be fall-prone (i.e., at high risk for falls) they are subject to restrictions or special instructions regarding physical activity and mobility. However, it seems that repeating
instructions to cognitively impaired patients is ineffective. This emphasizes the problem of managing patients who suffer from confusion and other cognitive impairments, which are common conditions after stroke. It was unrealistic to expect that patients with serious cognitive impairments will understand and remember verbal instructions and recommendations regarding ambulation and physical activity.

* After a long day of therapy sessions, the faller was fatigued. He did not tolerate sitting in his wheelchair very long but was left sitting in his wheelchair after his therapy sessions. Imbalance between activity and rest throughout the day contributed to the faller’s decision to transfer independently.

* During shift change, RNs who work an eight hour shift are busy at the nursing station with verbal reports and handing off of patients’ information to incoming RNs. The times of shift change coincide with the times of the day when patients want to transfer (15:00-afternoons after therapy sessions when patients are tired and need a rest, 19:00-evenings when patients want to go to bed or 07:00-mornings when patients want to get out of bed). Levels of supervision in the unit, at these specific times, are decreased since RNs are participating in shift change verbal reporting/handoff.
Faller is diagnosed with right side middle cerebral artery stroke in acute care hospital. Jul 11, 2012

He has OT session working on grooming and ADL skills. 9:00 - 9:30

He is transferred to a rehabilitation hospital. Jul 25, 2012

He continues OT session working on left side arm movements. 9:30 - 10:00

Faller wakes up. Aug 6, 2012, 7:30

Faller sits on his wheelchair in his room, waiting for half an hour for his next therapy. 10:00 - 10:30

He has breakfast in dining-hall. 7:45 - 8:30

He has PT session at PT gym. 10:30 - 11:00

He has speech therapy session. 12:30 - 13:00

Porter transfers faller to dining hall and he has lunch. 11:40 - 12:30

Faller has second PT session. 13:00 - 13:30

Faller is brought back to his room by PT. 13:30

Faller has OT session with OTA in OT gym. 14:30 - 15:00

Faller's RN assists faller to transfer to bed, where he rests until his next therapy session. 13:30-14:30

RN enters faller's room to perform medical procedure for the patient sharing the room with the faller. 14:55

RN pulls the curtain around the roommate's bed. 14:55
Faller puts his right hand on side of the bed. 15:01

Faller un buckles wheelchair seat belt. 15:00

Faller has lack of insight into his disabilities.

Faller is cognitively impaired.

Faller is on five medications.

Faller doesn’t follow staff’s instructions to use call bell for transfers.

Faller suffers a right MCA stroke four weeks ago.

Faller has impaired coordination.

Faller feels the need to rush because he is disoriented and agitated.

Left-sided neglect makes faller extremely impulsive.

Case 17915: Sequence of Events
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Porter wheels faller back to his room beside his bed. 15:00

Faller is left sitting in his wheelchair next to left side of the bed, facing the foot of the bed, 15:00

Faller is left unattented in the room.

At shift change (15:00) RNs are busy conducting verbal reports at the nursing station.

RN shift change practice removes faller’s RN from his care for 30 minutes.

Faller does not tolerate sitting in wheelchair for too long.

Faller is fatigued after multiple therapy sessions.

Practice of keeping patients sitting in wheelchair after therapy sessions is tiring for the patients.

Standard practice in unit is to repeat instructions to cognitively impaired patients.

A pinlock or chair alarm was not installed on faller’s wheelchair.
Faller stands up to transfer from wheelchair to bed. 15:02

This was the first time the faller attempted to transfer independently.

Faller is unsupervised while transferring.

Faller needs at least 2 people assisting him with all transfers.

Faller has difficulty with postural control.

Faller’s right arm gives out. 15:03

Faller’s right arm and leg are unable to carry his weight.

Faller has general muscle weakness due to stroke.

Faller has left side hemiparesis caused by stroke.

Faller has balance difficulties.

Faller grabs onto the bed as he slides down. 15:04

Faller is too weak to recover from loss of balance.

Faller lands, face down, on floor. 15:05

RN at the next bed hears the sounds and asks “what happened?” 15:05

Faller tells RN that he fell. 15:06

RN uses call-beil to ask for help. 15:06

Two other RNs come into the room. 15:07

Two RNs help faller up. 15:07

The RNs assist faller back to bed and assess him for injuries. 15:08
SFIM Investigative Report

Leaving Room in Socks
2.7 Action by the faller prior to loss of balance:

☑ Walking (task-oriented)

2.8 Type of fall:

☐ Slip

2.9 Direction of the fall:

☐ Back

2.10 Environment at the fall location:

https://secure.empowerhealthresearch.ca/report/finalReport
☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Socks only

2.13 How did faller get up after the fall?

☐ Assisted by another person

☑ Nurse/Other staff

Please specify how the faller was assisted:

☑ Mechanical Lift

☑ Manual lift (no aide by device)

2.14 Injury? ☑ Yes

2.15 Injury severity:

☐ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☑ Bruise

2.17 Injury location:

☑ Lower back

☑ Hip ☐ Left
2.18 Type of medical attention received:

☑ Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No
3.1. Demographics:

Year of birth: 1955/03/26  Age Calculated: 57
Gender: Male
Population (Check all that apply):
☑ Stroke survivor

3.2 Falls history:

☐ Multiple faller (falls regularly)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Number of falls in the last week: 0
Number of falls in the last month: 1
Number of falls in the last year: 3

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

☑ Unknown

3.4 Marital status:

☐ Divorced

3.5 Mental status:

☑ Agitated/aggressive/combative

☑ Confused or disoriented

3.6 MMSE score:

☑ Not available

3.7 Education:

☐ Unknown

3.8 Mobility aids:
3.9 Other aids used by the faller:

- None

3.10 Medical problem at the time of the fall:

- Blood pressure (high or low)
- Deconditioning
- Incontinence
- Muscle weakness
- Pain

3.11 Medications:

17. Number of prescription medications used by the faller on the day of the fall

Medication Name:
- Acetaminophen 650 mg
- Acetylsalicylic acid 80 mg
- Atenolol 50 mg
- Chlorhexidine 0.12%
- Dalteparin 5000 units/0.2ml
- Diclofenac 1.5% solution
- Docusate sodium 100 mg
- Metformin 500 mg
- Pantoprazole EC 40 mg
- Rosuvastatin 10 mg
Ritalin 2.5 mg (began Aug 23)
Medication Name:
Tramadol ER 100 mg
Medication Name:
Seroquil 25 mg
Medication Name:
Colace 200 mg
Medication Name:
Oxycodone 10 mg
Medication Name:
Sennosides 8.6-17.2 mg
Medication Name:
Trazodone 50 mg

0  Number of over-the-counter medications used by the faller on the day of the fall
The faller was a 57-year-old man who suffered a subarachnoid hemorrhage. He had several falls while in the rehabilitation hospital. He also displayed significant wandering and exit-seeking behavior. The fall occurred in the morning, while the nurses were doing verbal reporting at shift change in the unit. The faller got out of bed and was walking towards the exit of the room when he slipped and fell. Because the faller had significant confusion and was poorly oriented to time and place, it was not possible to determine why the faller got out of bed or where he was going. The Post-Fall Review, done by the hospital staff, suggested that the faller was trying to reach the bathroom. Two nurses and a patient care provider used mechanical lift to help the faller back into bed. The faller did not have any visible injuries, but he complained of back pain, and remained severely agitated for the rest of that day.

The Faller
The faller had severe brain injury with associated hydrocephalus, and experienced a stroke secondary to subarachnoid hemorrhage, which affected the frontal lobes bilaterally. Before the stroke, the faller lived at home with his common-law spouse. He was more impaired on the left side than on the right. The faller had a history of alcohol abuse, hypertension, prostate cancer, and was a smoker. He had decreased strength in the lower extremities and showed some tactile neglect. The faller was also incontinent. At the time of the fall, he was on 17 medications, which could have contributed to his confusion.

The Fallern’s Cognition
Upon admission to the rehabilitation hospital, the faller’s cognition was significantly impaired. There were deficits in orientation, abstraction, memory, attention, calculation, insight, and judgement. Because of the faller’s cognitive impairments, he had great difficulty following instructions and learning new information. This impaired the ability of the staff to communicate safety information to the faller. The faller also demonstrated increasing frustration and aggression when staff attempted to orient him to time and place, which made the transmission of safety information even more difficult. The faller had previously been attending an orientation group to help with his disorientation and confabulation, however his behavior in the group was poor, and his attendance was discontinued.

Supervision
For the first two months of his stay in the rehabilitation hospital, the faller had fluctuating orientation and often thought he was back at his home. In addition to the disorientation, the faller displayed agitated outbursts, and was on more than one occasion aggressive towards the hospital staff. The faller had a total of three falls during his stay in the rehabilitation hospital. Despite the fact that he had been assessed at “at risk” for falls upon admission, the faller did not have a bed alarm installed until after the third fall. He also displayed wandering and exit-seeking behavior, and was on more than one occasion found while attempting to exit the unit. The staff was frequently unaware of the faller’s actions. The staff also reinforced the use of the call bell and staying in the wheelchair with regular verbal instruction, which did not work for the faller due to his poor short-term memory. Part of the fall prevention strategy was to discuss fall risk with patient and family. Because of his significant cognitive impairments, it was difficult to communicate the risk of falls to the faller. During shift change, the nurses gather at the nursing station for verbal reporting. Reporting takes place for approximately half an hour. This leaves one PCP and one porter to monitor all the patients on the unit until shift change is completed.

Organizational Factors
The faller was assessed as “at risk for falls” by the Schmid Fall Risk Assessment Tool upon admission to the hospital. The Schmid Tool does not capture impulsivity as a cognitive factor related to falls risk. The Schmid Tool also did not capture cognitive limitations with respect to memory. This is significant because the faller was very impulsive, in addition to having poor short-term memory. There is currently no falls risk assessment tool that is specific to stroke survivors.
In addition to implementing the Universal Fall Interventions (which are completed in all cases, with all patients), the health care team was required to also initiate “Individualized Fall Interventions Flowsheet”, which entails strategies to prevent falls and address risk factors that are specific to high risk patients. According to hospital policy, the staff was supposed to fill out this flowsheet on a weekly basis. The flowsheet included monitoring fluctuations in the patient’s orientation and behavior, and assessing the need for supervision devices (e.g. chair alarm) or restraints. However, in the case of the faller, there was no record of the Individualized Falls Intervention Flowsheet in the hospital records. There was no evidence that the individualized protocol for falls prevention was implemented for this patient. This is due in part to the fact that the Fall Interventions Protocol is relatively new (introduced in March, 2012) and compliance/implementation by hospital staff has been inconsistent within the unit.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

[Leaving room in socks 1.jpg]
[Leaving room in socks 5.jpg]
[Leaving room in socks 6.jpg]
### SFIM
Case ID: 2200712   Date: 2013-06-06   Subject #: 17698

**Swiss Cheese Report**

**Organizational Factors:**
- Schmid score does not capture cognitive risk factor of impulsivity.
- Schmid Fall Risk Assessment tool suggests discussing fall risk with patient and family.
- Stroke-specific falls assessment tools are not currently available.
- Individualized Fall Interventions Flowsheet was not completed for this patient.
- Completion of Individualized Fall Interventions Flowsheet is inconsistent on the unit.
- Fall Interventions Protocol is new (implemented in March, 2012).
- During verbal reporting/shift change, only 1 PCP and 1 porter are available to monitor patients.

**Supervision:**
- Fall risk was not discussed with patient or family.
- Devices for safety supervision (e.g. chair and bed alarm, pin lock seatbelt) are not being used with this patient.
- Staff only use verbal instructions to remind cognitively impaired faller to remain in wheelchair.
- Staff is unaware of faller’s actions (e.g. getting out of bed).

**Preconditions:**
- Faller has hemiparesis on left side.
- Faller has poor muscle strength.
- Faller lacks insight into his disabilities.
- Faller was diagnosed with a subarachnoid hemorrhage, affecting frontal lobes bilaterally.
- Faller has agitated outbursts.
- Faller speaks inappropriately to staff.
- Faller is increasingly agitated and unable to settle.
- Faller has difficulty with short-term memory.
- Faller shows frequent exit-seeking behavior.
- Faller is confused.
- Faller is on 17 prescription medications.
- Faller requires assistance with all activities of daily living.
- Faller requires assistance by at least one other person for all transfers and mobility.
- Faller is only wearing socks.

**Unsafe Acts:**
- Faller is assessed as at risk for falls upon admission, Jul 16, 2012
- Patient has a fall while attempting to independently rise from commode chair. 8:00, Jul 30, 2012
- During a PT session faller acts aggressively towards PT student.
- Faller makes several attempts to get out of bed during the evening. 22:00 - 23:45, Aug 7, 2012
- Faller has another fall while trying to get up from wheelchair independently. Aug 22, 2012
- Faller propels himself in a wheelchair towards a door and the stairwell. 13:40, Aug 24, 2012
- Nurses gather at nursing station for verbal reporting at shift change. 7:00, Aug 26, 2012
- Faller gets out of bed. 7:15
- Faller loses control of his balance.
- Faller slips while walking towards exit of room. 7:16
Conclusions

The faller was a 57-year-old man who suffered a subarachnoid hemorrhage. He had several falls while in the rehabilitation hospital. He also displayed significant wandering and exit-seeking behavior. The fall occurred in the morning, while the nurses were doing verbal reporting at shift change in the unit. The faller got out of bed and was walking towards the exit of the room when he slipped and fell. Because the faller had significant confusion and was poorly oriented to time and place, it was not possible to determine why the faller got out of bed or where he was going. The Post-Fall Review, done by the hospital staff, suggested that the faller was trying to reach the bathroom. Two nurses and a patient care provider helped the faller back into bed. The faller did not have any visible injuries, but he complained of back pain, and remained severely agitated for the rest of that day.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller had many preconditions that contributed to the fall. He had general muscle weakness and hemiparesis on the left side of his body. He was impulsive and confused, and had difficulty with learning new tasks due to memory impairment. He had poor short-term memory and consequently did not follow instructions well. He had a lack of insight into his condition and was under the impression that he could perform tasks independently. He frequently had agitated outbursts and was unable to settle. He spoke inappropriately to staff and was increasingly frustrated by attempts to orient him to time and place. He also showed frequent exit seeking behavior and was found naked on the floor on the day of the fall, only wearing his socks.

* Although the faller was assessed as “at risk for falls”, the fall risk was not discussed with the patient or family. As part of the Schmid Fall Risk Assessment protocol (used in the unit upon admission) and as stated by the BPGs for stroke care, when a patient is assessed as being “at risk for falls” the patient and/or family have to be taught about falls prevention strategies. According to Canadian Best Practice Recommendations for Stroke Care, 2010 updates: “Based on the risk assessment findings, an individualized falls prevention plan should be implemented for each patient. a) Educate patient re: risks and precautions  b) Provide skills training for families and caregivers re safely transferring and mobilizing the stroke patient  c) Topics should include: footwear, direction of transfer, gait aids, transfer belt use, seatbelt use, arm support devices, foot rests, and brakes”

* The patient did not have a bed alarm installed, because the Individualized Fall Intervention Flowsheet (which specifies the use of monitoring devices such as bed or chair alarm) had not been followed according to hospital policy. The Fall Interventions Protocol is inconsistently implemented by staff within the stroke unit. This is due in part to the fact that the protocol is relatively new (introduced in March, 2012).

* Although the faller was confused and did not follow instructions, standard practice at the rehabilitation unit is that staff repeatedly instruct the patient to remain in wheelchair. Instructions are regularly repeated to patients, however patients with cognitive impairment are incapable of adhering to instructions or often don’t remember what they were told. The effectiveness of this approach is questionable when dealing with severely cognitively impaired patients.

* During verbal reporting and shift change, nurses are gathered at the nursing station and only the PCP and porter were available to monitor the patients.

* The Schmid Fall Risk Assessment tool used for all new admissions to assess patient’s risk for falls is an easy to use and time effective assessment tool but only provides 2 options, either the patient is “at risk” or “not at risk” and does not provide more information on the level of falls risk (i.e. low, medium, high). The tool also fails to capture cognitive risk factors that are common in stroke patients, such as impulsivity and memory problems. This tool is often used in acute care settings, more comprehensive tools are used for rehabilitation hospitals. According to the Canadian Stroke Network’s SCORE (Stroke Canada Optimization of Rehabilitation through Evidence) Evidence Based Recommendations for the Upper and Lower Extremities and Risk Assessment Post-Stroke 2007, “all patients post stroke should be screened for risk of falling by a clinician with appropriate skills and experience at admission and all changes of environment”. The tools recommended in this document for use in stroke rehabilitation are the Timed Up and Go for ambulatory patients and STRATIFY for non-ambulatory patients. The falls risk assessment tool used
in the stroke unit is generic and not disease-specific. No stroke-specific falls risk assessment tool currently exists. More research is needed in this area.
Faller has four operative procedures while in the hospital. Apr 17 - Jun 25, 2012


Faller is transferred to stroke unit of rehabilitation hospital. Jul 16, 2012

Faller is assessed as at risk for falls upon admission. Jul 16, 2012

Fall risk was not discussed with patient or family.

Stroke-specific falls assessment tools are not currently available.

Faller was diagnosed with a subarachnoid hemorrhage, affecting both frontal and left parietal lobes. Apr 30, 2012

Faller has hemiparesis on left side.

Faller has poor muscle strength.

Faller lacks insight into his disabilities.

Faller has hemiparesis on left side. 8:00, Jul 30, 2012

Schmid score does not capture cognitive risk factor of impulsivity.
OT notes that Faller is generally confused and unable to follow commands. Jul 31, 2012

During a PT session Faller acts aggressively towards a PT student.

- Faller has agitated outbursts.
- Faller speaks inappropriately to staff.

Faller makes several attempts to get out of bed during the evening. 22:00 - 23:45, Aug 7, 2012

- Faller is increasingly agitated and unable to settle.
- Devices for safety supervision (e.g., chair and bed alarm, pin lock seatbelt) are not being used with this patient.

Faller has another fall while trying to get up from wheelchair independently. Aug 22, 2012

- Faller has difficulty with short-term memory.
- Staff only use verbal instructions to remind cognitively impaired Faller to remain in wheelchair.

Individualized Fall Interventions Flowsheet was not completed for this patient.

Completion of Individualized Fall Interventions Flowsheet is inconsistent on the unit.

Fall Interventions Protocol is new (implemented in March, 2012).

Faller lies in bed. 7:00 - 7:15

Faller propels himself in a wheelchair towards a door and the stairwell. 13:40, Aug 24, 2012

- Faller shows frequent exit-seeking behavior.

RN redirects Faller back to his room 13:40, Aug 24, 2012

Nurses gather at nursing station for verbal reporting at shift change. 7:00, Aug 26, 2012

During verbal reporting/shift change, only 1 PCP and 1 porter are available to monitor patients.
Faller gets out of bed. 7:15

He walks towards doorway to room. 7:16

Faller falls backwards and lies supine on floor. 17:16

Staff is unaware of faller's actions (e.g. getting out of bed).

Faller is confused.

Faller is on 17 prescription medications.

Faller requires assistance with all activities of daily living.

Faller requires assistance by at least one other person for all transfers and mobility.

Faller is only wearing socks.

Faller loses control of his balance.

Patient Care Provider (PCP) finds faller lying on the floor. 7:19

PCP and 2 RNs use lift device to transfer faller to bed.

Faller complains of pain in left hip and back, but no external injuries are found.

Bed check alarm is installed on faller's bed.
SFIM Investigative Report

Assisted to Washroom by Pregnant PCP
Fall Information

2.1 Date of the fall: 2012-09-15

2.2 Day: Saturday

2.3 Time of fall: 24-hour clock
7:30

2.4 Witnesses: Witnessed

Number of people at the scene? 1

2.5 Location of the fall:
- Indoors
- Public building (includes hospitals or long term care homes)
- Hospital or LTC room

2.6 Activity at the time of the fall:
- Standing on both feet

2.6a Was this person multi-tasking? Yes

2.7 Action by the faller prior to loss of balance:
- Rising out of bed, chair, toilet, bath
- Transferring (in-out bed, in-out seat, in-out wheelchair)

2.8 Type of fall:
- Slide against a wall or an object

2.9 Direction of the fall:
- Sideways left
2.10 Environment at the fall location:

☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Slippers

2.13 How did faller get up after the fall?

☑ Assisted by another person

☑ Nurse/Other staff

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☑ Yes

2.15 Injury severity:

☑ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☑ Bruise

2.17 Injury location:

☑ Arm, elbow ☑ Right
2.18 Type of medical attention received:

☑ None
☑ Already in hospital (attended by hospital staff)

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☑ Yes, please specify:

Pregnant PCP assisted the faller with toilet transfer for the first time.
3.1. Demographics:

Year of birth: 1938
Age Calculated: 74
Gender: Female
Population (Check all that apply): Senior
Acquired brain injury
Stroke survivor

3.2 Falls history:
Rare faller (fell only this one time in the past year)

3.4 Marital status:
Widowed

3.5 Mental status:
Normal, alert and oriented

3.6 MMSE score:
30

3.7 Education:
Secondary school completed

3.8 Mobility aids:
- Assistance by another person: All of the time
- Cane: Occasionally
- Wheelchair: All of the time

3.9 Other aids used by the faller:
- Bath bench/shower seat
- Bathroom grab bar
- Glasses: for distance
3.10 Medical problem at the time of the fall:

- Blood pressure (high or low)
- Deconditioning
- Heart conditions
- Muscle weakness
- Pain
- Recovering from surgery
- Stroke

Functional Independence Measure Score (Maximum score 126):
- Not available

Montreal Cognitive Assessment Score (Maximum score 30):
- 0

Montreal Cognitive Impairment Score (MoCA < 26):
- Not available

3.11 Medications:

11. Number of prescription medications used by the faller on the day of the fall

Medication Name:
- Acetylsalicylic acid 81 mg
Medication Name:
- Atorvastatin 40mg
Medication Name:
- Dalteparin 5000unit/2mL
Medication Name:
- Docusate sodium 100mg
Medication Name:
- Escitalpram 20mg
Medication Name:
- Gabapentin 600mg
Medication Name:
- Hydrocortison 1% cream 1appl
Medication Name:
- Indapamide 1.25mg
Medication Name:
- Pantoprazole EC 40mg
Medication Name:
- Perindopril 4mg
Medication Name:
- Acetaminophen 325-650mg

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 73 year old stroke survivor fell on Saturday, September 15, 2012 at 07:10. Like any other day, the faller woke up around 07:00 and used the call bell to call for going to the washroom. Since all seven nurses in the unit were partaking in the scheduled shift change and handover of responsibilities meeting, the personal care provider (PCP) attended to the faller. The PCP, who was 6 months pregnant, checked the transfer status posted above the faller’s bed before assisting her to the washroom. The instructions indicated assistance by at least one person. The PCP assisted the faller into her wheelchair then wheeled her into the washroom. The PCP parked the wheelchair perpendicular to the toilet, then stood behind the wheelchair as the faller stood up independently and grabbed onto the bathroom grab bars. The faller tried to hold onto the grab bars as she pulled up her nightgown and pivoted around to sit on the toilet. She was cognizant of the fact that the PCP was six months pregnant and was concerned for the well-being of the mother and baby. She attempted to maneuver onto the toilet by herself and decided not to ask for further assistance as she was worried that she would hurt the PCP and her baby. In an instant the faller’s left knee buckled and she lost balance. The faller was no longer able to hold onto the grab bars and when she let go she fell to her left side, hitting the wall, and then hitting the toilet with her head. She lay on the ground in front of the toilet and wheelchair while to PCP rushed outside the room to call for help. Three nurses ran to the scene and assisted the faller up. They helped her use the washroom and returned her to bed where she was assessed for injuries. Only minor bruising on her left arm and pain in the left shoulder were observed but no head injuries or changes in level of consciousness were reported.

The faller
This pleasant 73 year old female patient experienced a right middle cerebral artery (MCA) distribution infarct on June 25, 2012. At the time of the stroke she was at home and experienced acute onset of reduced level of consciousness. She also began to experience significant weakness involving the left side of her arm, leg and face. She was taken to a local hospital in where a CT scan confirmed the stroke in the right MCA. The structures involved were predominantly the subcortical white matter and basal ganglia and the cortex was relatively spared. She was subsequently transferred to a regional acute care health centre for reassessment by the clinical neurology team. She underwent a right carotid artery endarterectomy on August 22, 2012. She recovered well and was discharged back to the local hospital in where she stayed until admission to the regional rehabilitation hospital. She was admitted to stroke rehabilitation on September 4, 2012.

The faller had significant hemiparesis involving the left arm more than the left leg with limited ability to move either one. Her fingers remained flexed and she had no intrinsic movements in her hands and straightening her fingers caused her considerable discomfort. She had limited flexion and abduction in her left shoulder and mild shoulder pain but was able to participate in activities of daily living. She was alert and conversant and denied any depressive symptoms. She had moderate left sided facial weakness but full extraocular movements and full visual fields without neglect. She was not dysarthric and appeared not to have any significant perceptual deficits but was slow to respond. Her past medical history included: coronary artery disease (although she was not aware of this and did not complain of any chest pain), dyslipidemia, osteoarthritis, and she quit smoking 26 years ago. She had degenerative disc disease with some discectomies, a left shoulder surgery, hysterectomy and tubal ligation. Prior to her stroke, the faller was living alone in a 2 level farmhouse. Her husband passed away several years ago and her three sons were married and had children. One of her sons lived close by and visited the faller often. While the faller was in hospital all family members visited during weekends and were very supportive with her recovery. Her sons offered the faller to come and live with them after discharge, but the health care team recommended that she move into a long-term care home. She was referred to the community care access centre.

PCP
At 07:00 the PCP had just started her four hour morning shift. She was unfamiliar with the faller. Since the faller only required assistance from one person for transfers, she was deemed capable to help her to the washroom.
From 07:00 to 07:30 all RNs in the unit took part in verbal reports whereby patient information and responsibilities were handed from the night shift RNs to the day shift RNs. During this time, RNs did not conduct patient care and there were only two unregistered workers on the unit: one PCP and one porter. It is unknown if the PCP had difficulty with her tasks due to pregnancy. She refused consent to participate in this fall investigation. According to team leaders, she had not approached occupational health for modifications to her work load. According to one team leader, “Occupational health is available to all employees so if they [employees] have a health issue they [occupational health] would determine that they [employees] need special accommodations or modified types of work. It would all have to be done through occupational health and with medical support and conversations with their [employee’s] care providers. Sometimes the transitional accommodation plan is created based on if they [employees] have limitations within the scope of their role. In this case, this PCP had no limitations acknowledged...so certainly you can’t discriminate because somebody is pregnant. The only opportunity to modify work is that if that individual [PCP] had gone to occupational health and acknowledged the inability to do the work. Then, occupational health would be in touch with us [leaders] around was it reasonable to accommodate and what sorts of accommodations...and that’s not just for PCPs, that’s for any employee.”

Patient transfer chart
Before transferring the patient to the washroom, the PCP checked the transfer status chart posted above the patient’s bed. Before the incident, the transfer status did not specify that this patient required assistance on her left side. After the fall however, the PT changed the transfer status chart to include the specific need for assistance on the patient’s left side (i.e., someone must be present on patient’s left side at all times during transfers). For the faller, support on, specifically, her left side was essential because she had significant hemiparesis involving the left arm and leg with limited ability to move either one.

The environment
At the time of the fall the faller was inside the bathroom with the overhead lights on. The room was well lit and the floors were not wet or slippery. The washroom was clean and uncluttered. The three other beds in faller’s room were unoccupied and there were no other witnesses (except the PCP) to the fall.

Stroke affecting the basal ganglia
Patients who have experienced a stroke affecting the basal ganglia can experience a decrease in cognitive function, according to Sua et al. 2007 article in the Archives of Clinical Neuropsychology. Some of the functions affected by a stroke in the basal ganglia include problems with decision-making ability, memory, language, and attention. These symptoms improve over time, but rarely return to normal levels (Sua, C., Chen, H., Kwan, A., Linc, Y., & Guod, N, 2007). The faller may have had impaired decision making abilities when she decided to transfer independently.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

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SFIM  
Case ID: 2200812  
Date: 2013-06-06  
Subject #: 18303

Swiss Cheese Report

Organizational Factors:
- During 30 minute RN shift change today, staff ratio in the unit is 2 PCPs to 20 patients.
- If a pregnant PCP does not approach occupational health for workload adjustments, the PCP is expected to perform transfers as usual.
- Organizational policy for workload adjustments equates illness and pregnancy.

Supervision:
- There is only one PCP (who is pregnant) and one porter in the unit assisting patients during RN shift change.
- PCP's position is inappropriate for transferring this patient.
- PCP was unaware of specific transfer instructions to support faller on left side.
- PCP is unfamiliar with this patient.

Preconditions:
- All 7 RNs are participating in shift change verbal reporting between 7:00-7:30.
- Faller requires one person assistance for transfers and mobility.
- Faller has left side weakness due to stroke.
- Specific transfer instructions (left side support) were missing from patient's transfer diagram.
- Due to concern for the safety of the pregnant PCP, the faller attempts to transfer to toilet independently.
- PCP is in advanced stage of pregnancy (6 months).
- Faller is left side hemiplegic.
- Faller suffered a right MCA infarct 12 weeks ago.
- Faller has morning fatigue.
- Faller has general muscle weakness.
- Faller is on 11 medications.
- Faller loses control of her balance.

Unsafe Acts:
- Pregnant PCP comes into room to assist faller to washroom. 7:05
- PCP stands behind the wheelchair. 7:08
- Faller stands up to pivot to the toilet on her own. 7:08
- Faller's left knee buckles. 7:09
- Faller lets go of the grab-bar. 7:10
Conclusions

The faller, a 73 year old stroke survivor fell on Saturday, September 15, 2012 at 07:10. Like any other day, the faller woke up around 07:00 and used the call bell to call for going to the washroom. Since all seven nurses in the unit were partaking in the scheduled shift change and handover of responsibilities meeting, the personal care provider (PCP) attended to the faller. The PCP, who was 6 months pregnant, checked the transfer status posted above the faller’s bed before assisting her to the washroom. The instructions indicated assistance by at least one person. The PCP assisted the faller into her wheelchair then wheeled her into the washroom. The PCP parked the wheelchair perpendicular to the toilet, then stood behind the wheelchair as the faller stood up independently and grabbed onto the bathroom grab bars. The faller tried to hold onto the grab bars as she pulled up her nightgown and pivoted around to sit on the toilet. She was cognizant of the fact that the PCP was six months pregnant and was concerned for the well-being of the mother and baby. She attempted to maneuver onto the toilet by herself and decided not to ask for further assistance as she was worried that she would hurt the PCP and her baby. In an instant the faller’s left knee buckled and she lost balance. The faller was no longer able to hold onto the grab bars and when she let go she fell to her left side, hitting the wall, and then hitting the toilet with her head. She lay on the ground in front of the toilet and wheelchair while to PCP rushed outside the room to call for help. Three nurses ran to the scene and assisted the faller up. They helped her use the washroom and returned her to bed where she was assessed for injuries. Only minor bruising on her left arm and pain in the left shoulder were observed but no head injuries or changes in level of consciousness were reported.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller had significant hemiparesis involving the left arm more than the left leg with limited ability to move either one. Her fingers remained flexed and she had no intrinsic movements in her hands and straightening her fingers caused her considerable discomfort. She was not dysarthric and appeared not to have any significant perceptual deficits but was slow to respond. Due to a stroke affecting the basal ganglia, the faller had difficulty with decision-making abilities.

* The faller had significant muscle weakness and was left side hemiplegic. She had morning fatigue and was unsteady on her feet when she first rose from bed. The faller required the assistance of at least one other person for all transfers and ambulation.

* Although the PCP followed transfer instructions written on the transfer status chart posted above the patient’s bed, the chart did not specifically indicate that the faller needed assistance on her left side. Therefore, during the transfer from wheelchair to toilet, the PCP was positioned inappropriately as she was standing behind the wheelchair and not on faller’s left side. The transfer instructions were changed by the PT after the fall.

* Although the faller recognized that she needed more assistance on her left side and that the PCP was not in an optimal position to support her, she chose not to say anything because she was concerned about the well-being of the pregnant PCP. She stated that she did not want to unintentionally harm the PCP or her child if she happened to fall and instead decided to transfer herself to the toilet independently.

* The PCP had not visited occupational health for modifications to her workload. This indicates that the PCP did not feel that her pregnancy was preventing her from completing her normal tasks. Although the PCP felt comfortable performing her roles and responsibilities as usual, this information was not provided to the faller who assumed, based on the physical appearance of the PCP, that she was incapable of performing her duties.

* Since the PCP did not approach occupational health for workload adjustments, the PCP was expected to perform transfers as usual.
The organizational policy for workload adjustments equates illness and pregnancy.

During the morning shift change, all seven RNs partake in a mandatory shift change meeting whereby patient information from the night shift RN is passed on to the day shift RN. This report meeting took place from 07:00 to 07:30. During this time, there was only one PCP and one porter in the unit to assist 20 patients. If a patient requires assistance with transfers or ambulation then he/she has to wait for either the PCP or porter or for the RN to be done with reports.


She is transferred to an acute care hospital to undergo a right carotid artery endarterectomy. Aug 22, 2012

Faller is transferred back to the local hospital for recovery. Aug 22 - Sep 4, 2012

Pregnant PCP comes into room to assist faller to washroom: 7:05

All 7 RNs are participating in shift change verbal reporting between 7:00-7:30.

There is only one PCP (who is pregnant) and one porter in the unit assisting patients during RN shift change.

During 30 minute RN shift change today, staff ratio in the unit is 2 PCPs to 20 patients.

Faller requires one person assistance for transfers and mobility.

Faller has left side weakness due to stroke.

PCP's position is inappropriate for transferring this patient.

Faller is admitted to a rehabilitation hospital. Sep 4, 2012

Faller wakes up. Sep 15, 2012, 7:00

She uses call bell to call for help going to the washroom: 7:00

PCP assists faller to transfer from bed to her wheelchair. 7:07

PCP wheels her to the washroom. 7:07

PCP stands behind the wheelchair. 7:08

PCP parks wheelchair perpendicular to the toilet. 7:07
Organizational policy for workload adjustments equates illness and pregnancy.

Faller suffered a right MCA infarct 12 weeks ago.

Due to concern for the safety of the pregnant PCP, the faller attempts to transfer to toilet independently.

Specific transfer instructions (left side support) were missing from patient's transfer diagram.

PCP is unfamiliar with this patient.

PCP was unaware of specific transfer instructions to support faller on left side.

Faller is left side hemiplegic.

Faller is left knee buckles. 7:09

Faller holds onto the bathroom grab-bar in front of her. 7:09

Faller grabs the grab bar with right hand. 7:08

Faller stands up to pivot to the toilet on her own. 7:08

If a pregnant PCP does not approach occupational health for workload adjustments, the PCP is expected to perform transfers as usual.

PCP is in advanced stage of pregnancy (6 months).

Organizational policy for workload adjustments equates illness and pregnancy.

Faller is left side hemiplegic.
Faller hits the toilet bowl
Faller hits the wall with the left side of her body. 7:10
Faller slides down against the wall. 7:10
Faller hits the toilet bowl with her head. 7:10

Faller lets go of the grab-bar. 7:10
Faller has morning fatigue.
Faller has general muscle weakness.
Faller is on 11 medications.
Faller loses control of her balance.

She lays on the ground in front of the toilet and wheelchair. 7:11
PCP goes out of room to call for help. 7:11
Three RNs rush into the room to help faller up. 7:12
They assist faller back to the toilet. 7:12

RN1s assess the faller for injuries. 7:15
SFIM Investigative Report

Sliding Off Wheelchair
Fall Information

2.1 Date of the fall: 2012-10-17
2.2 Day: Wednesday
2.3 Time of fall: 24-hour clock
   11:00
2.4 Witnesses: Witnessed
   Number of people at the scene? 1
2.5 Location of the fall:
   - Indoors
   - Public building (includes hospitals or long term care homes)
   - Hospital or LTC room
2.6 Activity at the time of the fall:
   - Sitting (wheelchair)
2.6a Was this person multi-tasking? Unknown
2.7 Action by the faller prior to loss of balance:
   - Other, please specify:
     Sliding forward in wheelchair.
2.8 Type of fall:
   - Slide against a wall or an object
2.9 Direction of the fall:
   - Forward
2.10 Environment at the fall location:

☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ Wheelchair

2.12 Footwear worn by the faller at the time of the fall:

☑ Shoes

2.13 How did faller get up after the fall?

☒ Assisted by another person

☑ Nurse/Other staff

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☒ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☒ No
SFIM  
Case ID: 2200912  
Date: 2013-06-06  
Subject #: 18675  

Information About the Faller

3.1. Demographics:

Year of birth: 1943  
Age Calculated: 69  
Gender: Male  
Population (Check all that apply):  
- Senior  
- Acquired brain injury  
- Stroke survivor

3.2 Falls history:

- Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency  
Number of falls in the last week: 0  
Number of falls in the last month: 1  
Number of falls in the last year: 2

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

- Unknown

3.4 Marital status:

- Married

3.5 Mental status:

- Normal, alert and oriented

3.6 MMSE score:

- Not available

3.7 Education:

- Unknown

3.8 Mobility aids:
\checkmark Wheelchair  \checkmark All of the time

3.9 Other aids used by the faller:

\checkmark Seat belt in wheelchair

3.10 Medical problem at the time of the fall:

\checkmark Arthritis  \checkmark Osteoarthritis
\checkmark Blood pressure (high or low)
\checkmark Deconditioning

\checkmark Heart conditions
\checkmark High Cholesterol
\checkmark Muscle weakness
\checkmark Pain

\checkmark Recovering from surgery

\checkmark Stroke

Functional Independence Measure Score (Maximum score 126):
21

Montreal Cognitive Assessment Score (Maximum score 30):
6

Montreal Cognitive Impairment Score (MoCA < 26):
\checkmark Yes

3.11 Medications:

18 Number of prescription medications used by the faller on the day of the fall

Medication Name:
Acetylsalicylic acid 325 mg

Medication Name:
Amlodipine 5 mg daily

Medication Name:
Atorvastatin 10 mg daily

Medication Name:
Bimatoprost 0.01% 1 drop

Medication Name:
Bisacodyl 10 mg

Medication Name:
Citalopram 10 mg

Medication Name:
Dalteparin 0.2 mL

Medication Name:
Digoxin 0.125 mg

Medication Name:
Domperidone 10 mg
Medication Name: Methotrimenazine 6.25 mg
Medication Name: Metoprolol 25 mg
Medication Name: Pantoprazole EC 40 mg
Medication Name: Perindopril 6 mg
Medication Name: Thiamine 100 mg
Medication Name: Vitamin D 1000 u
Medication Name: Senna, 2 tablets
Medication Name: Mineral oil to ears
Medication Name: Acetaminophen 1000 mg

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller was a 69-year-old gentleman who suffered a myocardial infarction and subsequent series of strokes. He had a number of complications, including respiratory difficulties, a tracheotomy, and pneumonia. He also experienced trouble sleeping and delirium upon admission to the rehabilitation hospital. The faller spoke Arabic as his first language and only spoke minimal English. Most of his communication with hospital staff was translated by his son. On the day of his fall, the faller had been shifting forward in the seat of his wheelchair in an attempt to become more comfortable. This was a frequent behavior of the faller, as his wheelchair was the wrong size and did not fit him properly. After a busy morning of therapy session, the faller had been brought back to his room and left alone, sitting in his wheelchair. The faller slid forward too far on the wheelchair seat and fell off the wheelchair onto the floor. His roommate alerted the nurses and they helped him back into the wheelchair. The faller was assessed for injuries but none were found. The faller later complained of left shoulder pain.

Faller
Twelve years ago, the faller experienced a myocardial infarction and first stroke. He was admitted to the hospital on April 28, 2012 with myocardial infarction. The faller underwent coronary artery bypass surgery on May 11, 2012. During postoperative recovery, the faller awoke from the anesthia with right hemiparesis. He was transferred to the ICU where he developed generalized weakness secondary to critical illness polyneuropathy. On May 12, 2012 he had multiple infarcts affecting the brain stem, the cerebral and cerebellar hemispheres bilaterally and a left pontine stroke. He was transferred to the regular ward on August 9, 2012 where intensive efforts at mobilization and physiotherapy were put in place. During his stay in the acute care hospital, the faller suffered from pneumonia, hypernatremia, delirium and sleep deprivation, renal dysfunction, urinary tract infection and encephalopathy. Once these issues cleared the faller was admitted to the rehabilitation hospital on September 27, 2012. The faller was cognitively impaired and confused upon admission to the rehabilitation hospital. His MOCA score was 6, however the OT noted that the MOCA had been administered without a translator, so the accuracy is questionable.

The faller had a number of other health problems including arthritis and chronic pain in his knees. He was on 18 different medications. This pain was exacerbated by the wheelchair he was given in the rehabilitation hospital which was too small for him and caused added discomfort. The faller’s developed a strategy to alleviate pain in the lower back by slouching down in his wheelchair. Patients who have undergone cardiac bypass surgery are given sternal precautions which include: “avoiding the use of their arms excessively, such as pushing themselves out of a chair or reaching back before sitting down”. The faller may have been attempting to alleviate his back pain by sliding instead of pushing himself out of the wheelchair. The faller’s health care team attempted to fix this problem by replacing the wheelchair’s seat cushion with a special ergonomic cushion.

Wheelchair
The OT in the rehabilitation hospital only received information on the faller’s height and weight prior to his arrival from the acute care hospital. Height and weight alone are not sufficient to correctly fit a wheelchair to a patient. Upon admission to the rehabilitation hospital, the faller was assigned a wheelchair by the OT. All the wheelchairs are provided from a private company on contract with the hospital. In order to correctly fit the size of the wheelchair and the depth of the wheelchair seat, an occupational therapist needs a number of specific measurements. The OT measures height, width, and seat depth of chair, as well as measurements related to the patient’s body such as length of pelvis and limbs, etc. However, thorough fitting assessments are time-consuming and could take an hour or more. In this case, the OT did not conduct a complete assessment but relied on her clinical judgement to assign the wheelchair to the faller. When it became evident that the faller was sliding forward in his wheelchair, the occupational therapist replaced the standard wheelchair seat cushion with a ROHO brand seat cushion. The ROHO seat cushion is meant to provide pressure relief and to conform to the shape of the client’s body (product information available at http://www.therohogroup.com/products/seat%20cushions/index.jsp). This seat cushion was the only modification made to the chair prior to the fall.
Supervision
The faller had been assessed as at risk for falls upon admission to the hospital. After his slouching behavior was noticed by the staff, they installed a four-point seatbelt on his wheelchair. This further exacerbated pain in the faller’s knees and back, as it prevented him from moving. His need to reduce his pain (by slouching) was not properly identified by nor communicated to the health care team. The faller was able to undo the seatbelt on his own and did so on more than one occasion. The staff repeatedly communicated to the faller the importance of staying seated with his seatbelt fastened and not slouching in his wheelchair. The faller’s son acted as an interpreter to relay this information to the faller. The faller’s son was also informed that the faller was at risk for falls. However, this safety instruction from both the faller’s son and health care team did not change the faller’s behavior. Due to his memory impairment and language barriers, the faller had difficulty following instructions and did not heed warnings to stay in his wheelchair with his seatbelt fastened.

There was no plan to replace the faller’s wheelchair with a different, better-fitting wheelchair until after his fall. The OT believed that the modifications to his current wheelchair (replacing seat cushion, installing four point seatbelt) would be sufficient to make the wheelchair more comfortable and prevent sliding forward.

There was a sense of inevitability to the incident, as reflected in this quotation from an interview with RN: “I knew he’d probably be falling soon because of how he kept pushing himself forward in his chair”. Although the staff had followed falls prevention protocol for “at risk” patients, the fall still occurred. In this case, the falls prevention strategies included discussing risk of falling with patient and family, replacing the seat cushion on the wheelchair to make it more comfortable, and installing a seatbelt. However, despite these strategies, the faller still slid out of his wheelchair and fell.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

IMG_2004.jpg
IMG_2005.jpg
previous WC3.jpg
SFIM  
Case ID: 2200912  
Date: 2013-06-06  
Subject #: 18675

Swiss Cheese Report

Organizational Factors:

- Full wheelchair assessment is time-consuming (1 hour) and is often deemed unnecessary by clinicians.
- OT at rehabilitation hospital is only given information on the height and weight of faller prior to transfer from acute care.
- Hospital wheelchairs come from a generic stock provided by a private company.
- No falls prevention strategy was put in place to prevent faller from sliding down his wheelchair seat.

Supervision:

- Time constraints, due to OT workload, make full wheelchair assessment impractical.
- Staff is unaware of faller’s pain.
- Faller’s son is sole translator.
- Staff repeatedly instruct the faller in English to use call bell.
- Staff repeatedly instruct faller not to get out of wheelchair independently.
- Time constraints, due to workload, do not allow therapists to assist with transferring patient after a therapy session.
- Faller’s level of discomfort when sitting in wheelchair is not clearly communicated between healthcare team members.

Preconditions:

- OT relies on her clinical judgment/experience to fit wheelchair for newly admitted patients (faller).
- Wheelchair is not the right size for faller.
- Height and weight alone are not sufficient to adequately fit wheelchair to patient.
- Wheelchair seat is too shallow.
- Faller complains that wheelchair is uncomfortable.
- Faller tries to work through knee and back pain on his own.
- Faller speaks Arabic but not English.
- Faller has severe arthritis and chronic pain in his knees and back.
- Faller is tired after 1 hour and 45 minutes of continuous therapy sessions.
- Faller does not understand English.
- Faller is restless.
- Faller experiences a lot of pain.
- Sliding forward on wheelchair seat alleviates pain in faller's knees.
- Faller has right side weakness.
- Faller has poor trunk control.
- Faller was diagnosed with multiple bilateral cerebral infarcts and a left pontine stroke 5 months ago.
- Faller is on 18 prescription medications.

Unsafe Acts:

- OT does not complete full wheelchair assessment.
- OT performs a quick assessment of faller for a wheelchair fitting upon admission to the

https://secure.empowerhealthresearch.ca/report/finalReport
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Sep 27, 2012</td>
<td>Faller frequently shifts in his wheelchair.</td>
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<tr>
<td></td>
<td>Faller continues to slouch and shifts in his wheelchair.</td>
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<tr>
<td>Oct 7 - Oct 17, 2012</td>
<td>Speech therapist left faller in the room, sitting in wheelchair.</td>
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<td>Faller unbuckles the seatbelt on his wheelchair.</td>
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<td></td>
<td>Faller loses control of his balance.</td>
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<tr>
<td></td>
<td>Faller shifts forward on wheelchair seat.</td>
</tr>
<tr>
<td></td>
<td>Faller slides off of the wheelchair seat.</td>
</tr>
</tbody>
</table>
Conclusions

The faller was a 69-year-old gentleman who suffered a myocardial infarction and subsequent stroke. He had a number of complications following the strokes including respiratory difficulties, a tracheotomy, and pneumonia. He also experienced trouble sleeping and delirium upon admission to the rehabilitation hospital. The faller spoke Arabic as his first language and only spoke minimal English. Most of his communication with hospital staff was translated by his son. On the day of his fall, the faller had been shifting forward in the seat of his wheelchair in order to alleviate knee and back pain. This was a frequent behavior of the faller, as his wheelchair was too small for him and did not fit him properly. After a busy morning of therapy session, the faller had been brought back to his room and left alone, sitting in his wheelchair. The faller slid forward too far on the wheelchair seat and fell off the seat onto the floor. His roommate alerted the nurses and they helped him back into the wheelchair. The faller was assessed for injuries but none were found. The faller later complained of left shoulder pain.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller had a 5 month long hospital stay that had many complications. He has been deconditioned and weakened by his illnesses and long hospitalization. He was on 18 prescription medications which made him confused, weak and fatigued. The faller also had several chronic medical conditions which contributed to the fall. He suffered from arthritis in both knees and chronic back pain.
* The faller was not able to communicate to the staff that he was in pain and due to a language barrier. Faller only spoke Arabic and did not understand English well. Staff was unable to recognize his constant fidgeting as a sign of discomfort.
* Because his wheelchair was not the appropriate size for him, the faller felt an increased level of discomfort when sitting in it. He found that when he slid his hips forward on the seat of the wheelchair and slouched, this position somewhat alleviated the pain in his back and knees.
* The OT in the rehabilitation hospital was only given information from the referring hospital on the patient’s height and weight. This information was not sufficient to select a well-fitting wheelchair when the faller arrived at the rehabilitation hospital. The rehabilitation hospital did not provide patients with new wheelchairs. The available resources dictated the use of generic hospital wheelchairs, which were not perfectly fitted to each patient.
* The OT chose not to conduct a full assessment to fit the wheelchair to the faller. Because of time constraints, due to OT workload, it was common practice for the OT to rely on clinical judgment in order to fit the wheelchair to the patient.
* After an hour and 45 minutes of continuous therapy sessions in the morning of the fall, the faller felt restless and tired. After his last therapy session, the faller was brought back to his room by the speech language therapist and left alone, sitting in his wheelchair.
* Although the staff repeatedly instructed the faller in English to use the call bell and not get out of wheelchair independently, the faller was unable to understand instructions as he did not speak English but only Arabic.
* The therapists who return patients to their rooms often leave the patients sitting in wheelchairs and do not assist with transfers to bed. Due to workload, therapists have to leave to conduct next therapy session.
* Patients who have undergone cardiac bypass surgery are given sternal precautions which include: “avoiding the use of their arms excessively, such as pushing themselves out of a chair or reaching back before sitting down”. Therefore the faller may have been attempting to alleviate his back pain by sliding instead of pushing himself out of the wheelchair.
* The OT and RN were aware that the faller felt uncomfortable in his wheelchair, and attempted to relieve his pain with a new ROHO ergonomic seat cushion. Nevertheless he was frequently left sitting in his wheelchair for extended periods of time. Information on the faller’s discomfort was not regularly and thoroughly passed on to other staff members. The faller’s actions when sitting in the wheelchair were seen as a safety issue and a seatbelt was added to the wheelchair, which, when used, further aggravated the faller’s pain.
* The staff attempted to communicate to the faller the importance of staying seated with his seatbelt fastened and not slouching in his chair. The faller’s son acted as an interpreter to translate this information to the faller. The faller’s son was also informed that the faller was at risk for falls. However, due to faller’s memory impairment and language barriers, the faller had difficulty comprehending instructions and due to persistent pain, did not heed warnings to stay in his wheelchair with his seatbelt fastened.
* Although the staff had followed standard protocol for falls prevention for “at risk” patients, the fall still occurred. In this case, the falls prevention strategy included discussing risk of falling with patient and family, replacing the seat cushion on the wheelchair to make it more comfortable, and installing a seatbelt.

*The faller received a new, better-fitted wheelchair after this fall had occurred, 20 days after admission to rehabilitation hospital when first wheelchair was assigned.
Faller has a stroke/transient ischemic attack that causes right-sided paralysis, which suddenly improves after one week, May 2000.

After surgery, faller has a bilateral cerebral and cerebellar stroke, multiple infarcts affecting the brain stem, and a left pontine stroke, May 12, 2012.

Faller has a myocardial infarction and is admitted to acute care hospital, Apr 28, 2012.

Faller has a difficult recovery, with respiratory problems, multiple infections, a tracheostomy, and pneumonia, May 12 - Sep 26, 2012.

He is later transferred to a second acute care hospital, May 9, 2012.


Faller is transferred to rehabilitation hospital, Sep 27, 2012.

OT performs a quick assessment of faller for a wheelchair fitting upon admission to the rehabilitation hospital, Sep 27, 2012.

OT relies on her clinical judgment/experience to fit wheelchair for newly admitted patients (faller).

OT does not complete full wheelchair assessment.

Full wheelchair assessment is time-consuming (1 hour) and is often deemed unnecessary by clinicians.

Time constraints, due to OT workload, make full wheelchair assessment impractical.
Faller frequently shifts in his wheelchair, Sep 27 - Oct 5, 2012

Wheelchair is not the right size for faller.

OT at rehabilitation hospital is only given information on the height and weight of faller prior to transfer from acute care.

Height and weight alone are not sufficient to adequately fit wheelchair to patient.

Wheelchair seat is too shallow.

Hospital wheelchairs come from a generic stock provided by a private company.

Faller complains that wheelchair is uncomfortable.

No falls prevention strategy was put in place to prevent faller from sliding down his wheelchair seat.

OT replaces regular cushion on the faller's wheelchair with a specialized ROHO cushion to provide pressure relief, for greater comfort, Oct 5, 2012

Faller continues to complain of discomfort, Oct 7, 2012

Faller frequently slouches forward to relieve back pain.
OT installs a four-point seatbelt on wheelchair to prevent him from slouching.

Faller continues to slouch and shifts in his wheelchair. Oct 7 - Oct 17, 2012

Faller tries to work through knee and back pain on his own.

Staff is unaware of faller's pain.

Faller speaks Arabic but not English.

Faller's son is sole translator.

Faller has severe arthritis and chronic pain in his knees and back.

Faller has dressing and grooming session with OT. Oct 17, 8:45 - 9:30

He has session with PT. 9:30 - 10:00
He has session with speech language pathologist. 10:00 - 10:30

Speech language therapist wheels faller back to his room. 10:30 - 10:35

Speech therapist left faller in the room, sitting in wheelchair. 10:35

Faller unbuckles the seatbelt on his wheelchair. 10:50

Faller is tired after 1 hour and 45 minutes of continuous therapy sessions.

Staff repeatedly instruct the faller in English to use call bell.

Staff repeatedly instruct faller not to get out of wheelchair independently.

Time constraints, due to workload, do not allow therapists to assist with transferring patient after a therapy session.

Faller’s level of discomfort when sitting in wheelchair is not clearly communicated between healthcare team members.

Faller does not understand English.

Faller is restless.

Faller experiences a lot of pain.
Faller shifts forward on wheelchair seat. 10:50
- Sliding forward on wheelchair seat alleviates pain in faller's knees.
- Faller loses control of his balance.

Faller slides off of the wheelchair seat. 10:51
- Faller has right side weakness.
- Faller has poor trunk control.

Faller lands on his behind near foot pedals of wheelchair.
- Faller was diagnosed with multiple bilateral cerebral infarcts and a left pontine stroke 5 months ago.
- Faller is on 18 prescription medications.

Faller's roommate walks to RN station to alert nurses of fall. 10:52

Three RNs help faller back into wheelchair.
SFIM Investigative Report

Having a Bad Day, Trying to Go to Bed
Fall Information

2.1 Date of the fall: 2012-11-07
2.2 Day: Wednesday
2.3 Time of fall: 24-hour clock 12:35
2.4 Witnesses: Un-witnessed
2.5 Location of the fall: Indoors
Public building (includes hospitals or long term care homes)
Hospital or LTC room
2.6 Activity at the time of the fall:
Sitting (wheelchair)
2.6a Was this person multi-tasking? No
2.7 Action by the faller prior to loss of balance:
Transferring (in-out bed, in-out seat, in-out wheelchair)
2.8 Type of fall:
Drop/Collapse
2.9 Direction of the fall:
Down (as in collapse)
2.10 Environment at the fall location:
2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

- Yes, please specify:
  Faller was feeling ill and out of character.
3.1. Demographics:

Year of birth: ___________________________ Age Calculated: 63
Gender: Female
Population (Check all that apply):
☑ Stroke survivor

3.2 Falls history:

☐ Occasional faler (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

☑ Unknown

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):
   Number of near falls in the past week: 2
   Number of near falls in the past month: 2

3.4 Marital status:

☐ Married

3.5 Mental status:

☑ Normal, alert and oriented
☑ Depressed

3.6 MMSE score:

☑ Not available

3.7 Education:

☐ Unknown

3.8 Mobility aids:

☑ Assistance by another person ☐ All of the time

☑ Wheelchair ☐ All of the time
3.9 Other aids used by the faller:

- Bed rails
- Glasses  ✔ for reading

3.10 Medical problem at the time of the fall:

- Blood pressure (high or low)
- Depression
- Diabetes (hypoglycemia)
- Muscle weakness

- Stroke Functional Independence Measure Score (Maximum score 126):
  
  25

- Montreal Cognitive Assessment Score (Maximum score 30):
  
  0

- Montreal Cognitive Impairment Score (MoCA < 26):
  - Not available

- Other, please specify:
  Multinodular goiter

3.11 Medications:

11 Number of prescription medications used by the faller on the day of the fall

Medication Name:
- Tylenol 325-650mg

Medication Name:
- Acetylsalicylic Acid 81 mg

Medication Name:
- Atorvastatin 10 mg daily

Medication Name:
- Dalteparin 5,000 units

Medication Name:
- Docusate Sodium 100 mg PO BID

Medication Name:
- Hydrochlorothiazide 25 mg

Medication Name:
- Levothyroxine 50 mcg

Medication Name:
- Metformin

Medication Name:
- Potassium chloride 600 mg

Medication Name:
- Septra DS
Trazodone 25-50mg

Number of over-the-counter medications used by the faller on the day of the fall
Investigative Report Summary

The faller was a 63-year-old woman who suffered a thalamic lacunar stroke, with affected areas in the adjacent thalamus and globus pallidus. Upon admission to the acute-care hospital, she was diagnosed with colonic adenocarcinoma, with no evidence of metastasis. She also suffered from hypertension and Type 2 diabetes. Due to dysarthria, the faller sustained some communication difficulties after her stroke. She was deconditioned and had muscle weakness. She was recovering well during her stay in both the acute care and the rehabilitation hospital, and was generally alert and oriented, with no sign of cognitive impairment. Before her stroke, the faller lived at home with her husband and they were both retired.

The faller was described as a cheerful and friendly woman, who participated well in her rehabilitation therapies. However, on the day of her fall, the faller’s mood was considerably depressed. She complained of pains and slept in her bed for most of the day. The fall under investigation (Nov 7, 2012) was the second fall that the faller had in two days. The day before (Nov 6, 2012), the faller had a fall while attempting to transfer from bed to the wheelchair. She did not use the call bell even though it was within reach. Similar to her second fall, the faller had the impression that she could transfer herself independently. On the day of the investigated fall, the faller did not feel well and was complaining of general stomach pains. Because of this, she declined going to any of her morning therapy sessions. This was unusual for the faller, as she previously had very good attendance at therapy sessions. Both the faller and her nurse mentioned that she was having a bad day and was not feeling well. Because she was not feeling well, the faller did not have her usual dressing and grooming session in the morning. She remained in bed and dozed until lunchtime. At lunch, she was wheeled to the cafeteria. She ate less than usual due to her stomach pains and finished lunch early. She was taken back to her room before the end of lunch time by the nurse covering the lunch shift. The faller was left alone, sitting in her wheelchair, until the other staff and patients were to return from lunch. After sitting in her wheelchair for a few minutes, the faller decided that she would rather lie in bed. Despite the fact that she had fallen the previous day while attempting to transfer independently, the faller decided not to use the call bell and thought she could do it by herself. When she attempted to stand up from the wheelchair, she lost balance and fell down on her behind, in front of the wheelchair. Shortly after, the covering nurse found the faller on the ground and helped her back into bed. There were no injuries as a result of the fall.

Supervision
Because the faller had requested to come back from lunch early, the covering RN left her alone in the wheelchair in her room. During lunchtime, 3 of the nursing staff were on lunch break while the other 3 RNs covered shifts. During this time of reduced staffing, it is difficult to provide supervision to patients who are not in the main cafeteria area. Although it was unusual for the faller to decline attending her therapy sessions, she was allowed to stay in bed for the morning and for the rest of the afternoon following her fall. She was given Tylenol in the morning but her stomach pains and discomfort were not investigated further.

Falls Prevention Policy and Implementation
After her first fall, her care team reviewed current falls prevention strategies, and reiterated to the faller the importance of using the call bell. Because the first fall was perceived to be caused by the faller’s overconfidence, the staff did not find it necessary to install a wheelchair seatbelt. However, the faller’s second fall occurred the next day. It is interesting to note that while the patient’s overconfidence was cited as a contributing factor to the first fall in the hospital’s Post-Fall review report, overconfidence was not a factor that was captured by the hospital’s falls risk assessment tool.

The hospital started using a new falls prevention strategy 8 months prior to this investigation (March 2012). The new protocol consisted of completing a falls assessment tool called the Schmid Fall Risk Assessment, which classified a patient as “Not at risk” or “At risk” for falls at admission. The new falls prevention protocol included both a universal and individualized falls prevention flow sheet, which specified what measures would be taken to...
prevent falls for each patient. Universal falls prevention strategies were implemented in all cases, while individualized falls prevention strategies are specific to each patient’s particular needs. As part of falls prevention protocol, a copy of the Schmid Scale assessment was filed in each patient’s chart.

In this case, a copy of the Schmid Scale was not found in the patient’s chart. When asked why the scale may have been missing from the patient’s chart, one of the falls prevention educators stated that because this protocol was relatively new, its implementation was still inconsistent. It is uncertain how the absence of this document may have affected the falls prevention strategies that were implemented for this patient. Prior to her second fall, the patient was under the universal falls prevention which included resources such as the call bell. After her second fall, a pin lock was installed on the faller’s wheelchair seatbelt. Because the faller’s original falls risk assessment was not in her file, it was not known what other strategies may have been recommended to prevent her from falling.

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SFIM
Case ID: 2201012
Date: 2013-06-06
Subject #: 18677

Swiss Cheese Report

Organizational Factors:

- A new falls prevention program was implemented in March, 2012, 8 months before this fall.
- Hospital-wide implementation of the new falls prevention strategy is inconsistent.
- After her first fall, health care team reviews falls prevention strategy for this patient and makes no changes.
- The Schmid Fall Risk Assessment tool used at this hospital does not capture overconfidence as a risk factor for falling.
- Hospital's falls prevention strategy does not require installation of a pin lock seatbelt after a fall.
- Unit is short-staffed during lunch time.

Supervision:

- It is unclear if this patient was at risk for falls.
- Cause of faller's pain was not investigated further by RN.
- There are three nurses in the unit during lunch time.
- Faller is left in her room unsupervised.

Preconditions:

- There is no record of faller's falls risk assessment upon admission.
- Faller is overconfident that she can transfer by herself.
- Faller has colonic adenocarcinoma.
- Faller has difficulty expressing her pain.
- Faller has dysarthria.
- Faller suffered left thalamic lacunar stroke.
- Faller has stomach pain.
- Faller has unspecified fatigue.
- Faller is not feeling like herself.
- Faller is on 11 prescription medications.
- This is the first time the faller is not feeling well since being in the rehabilitation program.
- Faller believes she could transfer herself.
- Faller has muscle weakness.
- Faller is deconditioned.

Unsafe Acts:

- Faller has a fall while attempting to transfer herself. Nov 6, 2012
- Faller's health care team completes a post-fall review report. Nov 6, 2012
- RN gives faller Tylenol.
- Covering RN leaves faller in wheelchair in room. 12:25
- Faller decides to get into her bed. 12:30
- Faller does not use call bell, although it is in reach.
- Faller attempts to stand up. 12:31
- Faller loses balance. 12:31
The faller was a 63-year-old woman who suffered a thalamic lacunar stroke, with affected areas in the adjacent thalamus and globus pallidus. Upon admission to the hospital, she was diagnosed with colonic adenocarcinoma, with no evidence of metastasis. She also suffered from hypertension and Type 2 diabetes. Before her stroke, the faller lived at home with her husband and they were both retired. The faller was described as a cheerful and friendly woman, who participated well in her rehabilitation therapies. However, on the day of her fall, the faller’s mood was considerably depressed. She complained of pains and slept in her bed for most of the day. The fall under investigation was the second fall that the faller had in two days. The day before, the faller had a fall while attempting to transfer from bed to the wheelchair. She did not use the call bell even though it was within reach. Similar to her second fall, the faller had the impression that she could transfer herself independently. The next day, she had another fall. On the day of the fall in question, the faller did not feel well and was complaining of stomach pains. Because of this, she declined going to any of her morning therapy sessions. This was unusual for the faller, as she previously had very good attendance at therapy sessions. Both the faller and her nurse mentioned that she was having a bad day and was not feeling well. She complained of general stomach pains. Because she was not feeling well, the faller did not have her usual dressing and grooming session in the morning. She remained in bed and dozed until lunch time. At lunch, she was wheeled to the cafeteria. She ate less than usual due to her stomach pains and finished lunch early. She was taken back to her room before the end of lunch time by the nurse covering the lunch time shift. The faller was left alone, sitting in her wheelchair, until the other staff and patients were to return from lunch. After sitting in her wheelchair for a few minutes, the faller decided that she would rather lie in bed. Despite the fact that she had fallen the previous day while attempting to transfer independently, the faller decided not to use the call bell and thought she could do it by herself. She lost her balance when she attempted to stand up from the wheelchair, and fell down on her behind, in front of her wheelchair. Shortly after, the covering nurse found the faller on the ground and helped her back into bed. There were no injuries as a result of the fall. After the incident, the nurse consulted the attending physician and the faller’s family with regards to installing a pin lock on the wheelchair seatbelt. The pin lock was installed by the OT the next day. The healthcare team also reinforced the necessity of assistance and use of the call bell for all transfers.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* Because the faller had requested to come back from lunch early, she was left alone in her wheelchair in her room. During lunchtime, 3 of the nursing staff was on lunch break while 3 other RNs covered shifts. During this time of reduced staffing, it is difficult to provide supervision to patients who are not in the main cafeteria area.

* The faller was given Tylenol in the morning but her stomach pains and discomfort were not investigated further.

* Because the faller’s first fall was perceived to be due to the faller’s overconfidence, the staff did not find it necessary to install a wheelchair seatbelt.

* The staff deemed it sufficient to review current strategies and reinforce safety protocol with the faller. However, the faller’s second fall occurred the next day. While the patient’s overconfidence was cited as a contributing factor to the first fall in the hospital’s Post-Fall review report, overconfidence was not captured as a risk factor by the hospital’s falls risk assessment tool.
* The hospital was using a fairly new falls prevention strategy that was introduced 8 months prior to the investigated fall. The protocol consisted of completing a falls assessment tool called the Schmid Fall Risk Assessment, which classifies a patient as “Not at risk” or “At risk” for falls. This strategy only allows for 2 options and does not differentiate between patients who are at higher risk or lower risk of falls (e.g. there is no gradient for patients who are at risk for falls). The new falls prevention strategy does not capture the variability in individual patient needs. For all ‘at risk’ patients, falls prevention strategies/recommendations are the same, which does not account for the variability or severity of patient’s conditions or mental states, overconfidence, or lack of insight.

* The faller was having a bad day. She was experiencing general stomach pains and did not feel like participating in her therapy sessions. She had recently been diagnosed with colonic adenocarcinoma. She had difficulty expressing her pain to the RN because of her dysarthria.

* Faller did not have a wheelchair alarm, or pin lock seatbelt installed until after her second fall. The hospital's patient safety strategies were reactive, responding to adverse events and mending their consequences. Consequently, the implementation of falls prevention strategies was also reactive and actions were put in place to prevent re-occurrence of this event. For example, in this case a pin lock was not installed on the faller’s seat belt until after her second fall.
Faller declines speech language session because her stomach hurts. 11:00

RN gives faller Tylenol.

Cause of faller's pain was not investigated further by RN.

Faller has colonic adenocarcinoma.

Faller has difficulty expressing her pain.

Faller has dysarthria.

Faller suffered left thalamic lacunar stroke.

Faller's RN leaves faller in dining room and goes on lunch break. 12:00

Faller eats lunch in dining room. 12:00-12:20

Faller asks to go back to her room early. 12:20

RN covering the lunch shift wheels faller back to bedroom. 12:20 - 12:25
Faller believes she could transfer herself.

Covering RN leaves faller in wheelchair in room. 12:25

Unit is short-staffed during lunch time.

There are three nurses in the unit during lunch time.

Faller is left in her room unsupervised.

Faller decides to get into her bed. 12:30

Faller has stomach pain.

Faller has unspecified fatigue.

Faller is not feeling like herself.

Faller is on 11 prescription medications.

This is the first time the faller is not feeling well since being in the rehabilitation program.

Faller attempts to stand up. 12:31

Faller does not use call bell, although it is in reach.

Faller believes she could transfer herself.

Faller loses balance. 12:31

Faller has muscle weakness.

Faller is deconditioned.

Faller falls down on bed. 12:32

Faller lays on floor between wheelchair and bed. 12:32

RN helps faller into bed. 12:35-12:40

Covering RN finds faller on the floor. 12:35

12:35 RN helps faller into bed. 12:35-12:40
SFIM Investigative Report

Fiance Catch
SFIM
Case ID: 9100112 Date: 2013-06-06 Subject #: 16776

Fall Information

2.1 Date of the fall: 2012-05-25
2.2 Day: Friday

2.3 Time of fall: 24-hour clock
21:30

2.4 Witnesses: Witnessed

Number of people at the scene? 1

2.5 Location of the fall:
- Indoors
- Private Residence
- Living room/ Den

2.6 Activity at the time of the fall:
- Walking

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
- Turning
- Walking (task-oriented)

2.8 Type of fall:
- Transient loss of consciousness

2.9 Direction of the fall:
- Back
2.10 Environment at the fall location:

☑ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Bare feet

2.13 How did faller get up after the fall?

☐ Assisted by another person

☑ Family/Friend/Roommate

Please specify how the faller was assisted:

☑ Manual lift (no aide by device)

2.14 Injury? ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No
3.1. Demographics:

Year of birth: 1950  
Age Calculated: 62
Gender: Male
Population (Check all that apply):  
- Acquired brain injury
- Stroke survivor

3.2 Falls history:

- Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

- Number of falls in the last week: 1
- Number of falls in the last month: 2
- Number of falls in the last year: 2

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

- Number of near falls in the past week: 1
- Number of near falls in the past month: 4

3.4 Marital status:

- Divorced

3.5 Mental status:

- Normal, alert and oriented
- Depressed

3.6 MMSE score:

- Not available

3.7 Education:

- Unknown

3.8 Mobility aids:
☑ Walker with 4 wheels for indoor or outdoor use (rollator) ⊗ Occasionally

3.9 Other aids used by the faller:

☑ None

3.10 Medical problem at the time of the fall:

☑ Acquired brain injury ⊗ Anoxic
☑ Arthritis ⊗ Osteoarthritis
☑ Blood pressure (high or low)
☑ Depression
☑ Heart conditions
☑ High Cholesterol
☑ Muscle weakness

☑ Seizures
☑ Stroke

Functional Independence Measure Score (Maximum score 126):
121

Montreal Cognitive Assessment Score (Maximum score 30):
25

Montreal Cognitive Impairment Score (MoCA < 26):
⊗ Yes

☑ Syncope (transient loss of consciousness)

3.11 Medications:

10 Number of prescription medications used by the faller on the day of the fall
Medication Name:
Ramipril/hydrochlorothiazide
Medication Name:
Zopiclone 7.5 mg
Medication Name:
Meloxicam 7.5 mg
Medication Name:
Fluoxetine 25 mg
Medication Name:
Clomipramine 20 mg
Medication Name:
ASA 325 mg
Medication Name:
Vitamin D
Medication Name:
Multivitamin
Medication Name:
Crestor 10 mg
Medication Name:
Dabigatran 150 mg

0 __ Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 62 year old stroke survivor, fell to the ground in his home on May 25, 2012 at approximately 21:30. On the day of the fall, the faller had an uneventful day at home with his fiancée. The fiancée is the faller’s sole caregiver. In the evening, the faller and fiancée sat in the living room watching television. The faller got up to go to the kitchen to take his medications (Zopiclone and Clomipramine at night). At around 21:30, after taking his medications the faller decided to go to bed. He started to walk back through the hallway towards the bedroom, going past the living room. The faller suddenly felt dizzy and had the sensation that the room was spinning. He started to walk towards his fiancée to tell her that he was going to fall. At first, the fiancé didn’t take the faller seriously. She thought he was joking around and did not realize he was actually feeling unwell. The faller then said “I’m going to fall.” The fiancé quickly got up and grabbed the faller around his torso. She supported the back of his head with her hands. She held the faller up for as long as she could. The faller then lost consciousness, his legs gave out, and he fell backwards. The fiancé fell on top of him. After a moment, the fiancé helped the faller back up, they both sat down on the couch to make sure they were okay. The faller continued to feel dizzy, so the couple went outside to get some fresh air. The faller’s dizziness did not go away, so the fiancé called an ambulance and the faller was taken to the emergency department of an acute care hospital. He was discharged later that night with an unconfirmed diagnosis of seizure.

The Faller
The faller was a 62-year-old man who was admitted to hospital following an episode of speech difficulty and unsteadiness on his feet. The faller’s fiancée found that he was somewhat unresponsive and noticed that his left eye was drooping. The next day, the faller had a headache on the left side, which worsened with movement. He also had nausea. The faller described feeling “fuzzy”; his memory was impaired and his speech difficulties persisted. He was brought to emergency and admitted to the neurology unit to investigate the possibility of stroke. The faller spent five days in hospital and was discharged with a diagnosis of stroke with suspected minor infarct. The faller sustained some gait ataxia and mild language difficulties. The faller’s comorbidities included myocardial infarction with pacemaker insertion, atrial fibrillation, hypertension, hyperlipidemia, depression and post-traumatic stress disorder. He also had a history of sexual abuse and severe traumatic head injury.

Seizures After Stroke
The faller recovered at home between January 25th and May 9th, 2012. After his stroke, the faller experienced dizzy spells and losses of consciousness. He had a fall at home in April, when he experienced a transient loss of consciousness and fell to the floor. The faller was then admitted to the Epilepsy Monitoring Unit (EMU) for evaluation of fainting spells and changes in consciousness that had occurred sporadically since his discharge from the Neurology Ward. The faller was monitored in the Epilepsy Ward between May 9 and May 11, 2012. The faller described having “spells” where he could see and hear but could not answer, and the spells were associated with excessive sweating. The spells also involved tonic movements in the hands and legs and occasional biting of the tongue. The spells would last 1 to 5 minutes. Afterwards, the faller was tired, confused, and had severe headaches. The attacks occurred every other day. The faller was diagnosed with psychogenic non-epileptic events. Psychogenic non-epileptic seizures (PNES), also known as Non-Epileptic Attack Disorders, are events superficially resembling an epileptic seizure, but without the characteristic electrical discharges associated with epilepsy. Thus, PNES are regarded psychological in origin. Due to the faller’s history of sexual abuse and traumatic head injury, it was believed that his seizures were psychological in nature. There was no cure for the faller’s psychogenic episodes, they were just controlled with medication (Dabigatran). The faller and his fiancé were informed that there was no need to visit the emergency room if the seizures happened again. However, the faller and this fiance did not recall being provided with suggestions on how to improve the faller’s safety when he lost balance as a result of seizures. They were not given any materials from the EMU regarding falls prevention or safety.
Community Health Services

The faller received CCAC care and participated in a Comprehensive Outpatient Rehabilitation Program (CORP). CORP was an outpatient rehabilitation program that provided occupational therapy, physical therapy, and social work services at a nearby hospital. The faller made significant improvements throughout his CORP program, including improvements in memory impairments, gait, and ability to perform activities of daily living. He also received occupational therapy from the CCAC.

Mobility and Rehabilitation

The faller had been provided with a walker upon discharge from the hospital, but found that it was inconvenient to use while in the house because it was too big to maneuver. Also, as the faller’s condition improved, he felt more confident to walk on his own. The faller’s rehabilitation therapies focused on his memory impairments and his ability to perform daily tasks. The faller reported improvements in dizziness and balance through the CORP; however, the faller continued to experience dizzy spells and transient loss of consciousness following discharge from the program.

Faller’s Fiancé
Faller was divorced and had no children. He lived with his fiancé, who was his primary caregiver. The faller’s fiancé was partially retired. They had recently moved in together after the faller had been discharged from the hospital. The fiancé was not given support or services to help her care for the faller, specifically in relation to his seizures and falls. At the time of discharge, both from the Neurological Ward of acute care hospital and from the EMU, neither the faller nor his fiancée remember receiving any recommendations or training on how to deal with the seizures and consequently, the falls.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

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SFIM
Case ID: 9100112  Date: 2013-06-06  Subject #: 16776

Swiss Cheese Report

Organizational Factors:
- At discharge from EMU, faller was not instructed how to manage dizzy spells and prevent falls.
- EMU did not provide fiance with any support or training to help her cope with faller's frequent dizzy spells and falls.
- Sending home literature on falls prevention for patients is not standard practice at EMU.

Supervision:
- Hospital health care team provides faller with a walker for use indoors and outdoors.
- Fiance risks her own safety by grabbing onto faller but does not know what else to do to help him.
- Fiance is faller's sole care provider.

 Preconditions:
- Faller prefers to walk without aids while at home.
- Walker is too large to maneuver within faller's home.
- Faller is diagnosed with a small cerebral infarction.
- Faller experiences dizzy spells that cause losses of balance.
- Faller has a history of acquired traumatic brain injury.
- Faller has undiagnosed seizures.
- Faller is diagnosed with psychogenic nonepileptic seizure.
- Faller had just taken medications.
- Faller is on 10 medications.
- Faller experiences transient loss of consciousness.

Unsafe Acts:
- Faller is discharged home with CCAC support for occupational therapy. Jan 25, 2012
- Faller frequently experiences transient changes in and losses of consciousness. Jan 25 - May 9, 2012
- Faller has a fall in his home. April, 2012
- Faller is discharged from EMU. May 11, 2012
- Faller feels dizzy and his surroundings are spinning. 21:28
- Fiance holds faller around his torso as long as she can. 21:29
- Faller loses control of his balance.
- Faller's legs give out. 21:29
The faller, a 62 year old stroke survivor, fell to the ground in his home on May 25, 2012 at approximately 21:30. On the day of the fall, the faller had an uneventful day at home with his fiancée. The fiancée is the faller’s sole caregiver. In the evening, the faller and fiancée sat in the living room watching television. The faller got up to go to the kitchen to take his evening medications (Zopiclone and Clomipramine). At around 21:30, after taking his medications the faller decided to go to bed. He started to walk back through the hallway towards the bedroom, going past the living room. The faller suddenly felt dizzy and had the sensation that the room was spinning. He started to walk towards his fiancée to tell her that he was going to fall. At first, the fiancée didn’t take the faller seriously. She thought he was joking around and did not realize he was actually feeling unwell. The faller then said “I’m going to fall.” The fiancée quickly got up and grabbed faller around his torso. The faller then lost consciousness, his legs gave out, and he fell backwards. The fiancée fell on top of him. After a moment, the fiancée helped the faller back up, they both sat down on the couch to make sure they were okay. The faller continued to feel dizzy, so the couple went outside to get some fresh air. The faller’s dizziness did not go away, so the fiancée called an ambulance and the faller was taken to emergency. He was discharged later that night with an unconfirmed diagnosis of seizure.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller had a history of severe traumatic head injury, depression and post-traumatic stress disorder. Thirteen days before this fall, he was diagnosed with psychogenic non-epileptic seizures. He relied on his fiancé for caregiving and support.
* Since his stroke, the faller suffered from psychogenic non-epileptic seizures and often had dizzy spells. He had a previous fall at home in April, which was the result of another loss of consciousness.
* After discharge from the hospital, the faller was given a walker to use at home. However, he rarely used his walker at home since he found it difficult to maneuver around the house.
* Although the faller and his fiancé were seen by epilepsy specialist, the safety of the faller in regards to falling was not discussed.
* The faller and his fiancé were not given recommendations or training for falls prevention during seizures when he was discharged from the neurology ward or the epilepsy monitoring unit.
* The faller’s fiancé was not provided with any training to help her care for the faller, especially during the times when he experienced dizziness.
* The faller’s fiancé was his sole care provider but she did not receive sufficient community health services/support to cope with the faller’s health issues. She also had medical issues of her own that she had to deal with.
* By grabbing onto the faller at the time of his transient losses of consciousness, the fiancé inadvertently exposed both the faller and herself to greater risk of injury.
Faller is brought to ER after an episode of slurred speech and unsteadiness. Jan 19, 2012

Faller is referred to neurology unit of acute care hospital. Jan 20, 2012

Faller is treated for a small infarct stroke and recovers in hospital. Jan 20 - Jan 25, 2012

Faller is discharged home with CCAC support for occupational therapy. Jan 25, 2012

Hospital health care team provides faller with a walker for use indoors and outdoors.

Faller prefers to walk without aids while at home.

Walker is too large to maneuver within faller's home.

Faller is diagnosed with a small cerebral infarction.

Faller begins Comprehensive Outpatient Rehabilitation Program. Feb 17, 2012

Faller progresses steadily, recovering at home and participating in therapies. Feb 17 - May 9, 2012

Faller frequently experiences transient changes in and losses of consciousness. Jan 25 - May 9, 2012

Faller has a fall in his home. April, 2012

Faller has undiagnosed seizures.

Faller experiences dizzy spells that cause losses of balance.

Faller has a history of acquired traumatic brain injury.
Faller goes to kitchen to take his medicine, 21:23

Faller has uneventful day resting at home, May 25, 2012

Faller is discharged from EMU, May 11, 2012

Faller is diagnosed with psychogenic non-epileptic seizure.

At discharge from EMU, faller was not instructed how to manage dizzy spells and prevent falls.

EMU did not provide fiance with any support or training to help her cope with faller's frequent dizzy spells and falls.

Sending home literature on falls prevention for patients is not standard practice at EMU.

Faller's fiance sits in living room watching T.V., 21:23

Faller takes his medications, standing at the kitchen counter, 21:24

Faller decides to go to bed, 21:28

Faller walks towards living room, 21:28

Faller feels dizzy and his surroundings are spinning, 21:28

Faler walks towards fiance while trying to say something, 21:28

Fiance thinks faller is joking around, 21:28

Faler tells fiance: "I am going to fall."

Faler had just taken medications.

Faler is on 10 medications.
Fiance stands up. 21:29

Fiance grabs faller with both hands. 21:29

Fiance holds faller around his torso as long as she can. 21:29

Fiance's legs give out. 21:29

Fiance risks her own safety by grabbing onto faller but does not know what else to do to help him.

Fiance is faller's sole care provider.

Fiancé loses control of his balance.

Fiancé experiences transient loss of consciousness.

Fiancé tries to brace faller's head. 21:29

Fiancé lands backwards on the floor. 21:30

Fiancé falls on top of faller. 21:30

Fiancé helps the faller get up. 21:31

Fiancé sits on a chair. 21:31

Fiancé feels the need for fresh air. 21:32

Fiancé and fiancé go outside of apartment to get fresh air. 21:35

Fiancé continues to feel dizzy. 22:00

Fiancé calls for an ambulance. 22:00

Ambulance arrives and takes faller to hospital. 22:10

Fiancé is discharged with an unconfirmed diagnosis of seizure. 23:30
SFIM Investigative Report

Reaching For Blanket
2.1 Date of the fall: 2012-06-30
2.2 Day: Saturday
2.3 Time of fall: 24-hour clock
   15:57
2.4 Witnesses: Witnessed
   Number of people at the scene? 1
2.5 Location of the fall: Indoors
   Private Residence
   Living room/ Den
2.6 Activity at the time of the fall:
   Standing on both feet
2.6a Was this person multi-tasking? Yes
2.7 Action by the faller prior to loss of balance:
   Carrying an object
2.8 Type of fall:
   Over - reach
2.9 Direction of the fall:
   Forward
2.10 Environment at the fall location:

☑ Obstacle on the path (clutter, animal, carpet, threshold, assistive device, etc.)

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Shoes

2.13 How did faller get up after the fall?

☐ Alone (self initiated)

2.14 Injury? ☐ Yes

2.15 Injury severity:

☐ Moderate - required medical attention (e.g. strain, extensive bruising, laceration, bleeding, burn, chipped tooth)

2.16 Injury type:

☑ Sprain/strain/dislocation

2.17 Injury location:

☑ Leg, knee, foot, toe(s) ☐ Left

2.18 Type of medical attention received:

☑ Other health care professional ☑ Other PSW
2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:
Faller's son was taking a nap on the living room floor, which he had never done before.
3.1. Demographics:

Year of birth: 1916  Age Calculated: 96
Gender: Female
Population (Check all that apply): Senior
Acquired brain injury
Stroke survivor

3.2 Falls history:

- Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Number of falls in the last week: __
Number of falls in the last month: __
Number of falls in the last year: 1
Other: __
2 other falls, time unknown: __

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

- Unknown

3.4 Marital status:

- Married

3.5 Mental status:

- Normal, alert and oriented

3.6 MMSE score:

27

3.7 Education:

- College or equivalent partial

3.8 Mobility aids:
3.11 Medications:

- Walker with 4 wheels for indoor or outdoor use (rollator)  Occasionally

3.9 Other aids used by the faller:

- Bath bench/shower seat
- Bed rails
- Glasses  for reading
- Hearing aid
- Raised toilet seat/Commode

3.10 Medical problem at the time of the fall:

- Acquired brain injury  Traumatic
- Blood pressure (high or low)
- Diabetes (hypoglycemia)
- Heart conditions
- Osteoporosis
- Pain
- Spontaneous fractures
- Stroke  Functional Independence Measure Score (Maximum score 126):
- Not available
- Montreal Cognitive Assessment Score (Maximum score 30):
- 0
- Montreal Cognitive Impairment Score (MoCA < 26):
- Not available

3.11 Medications:

- Number of prescription medications used by the faller on the day of the fall

<table>
<thead>
<tr>
<th>Medication Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandoz-valsartan 160 mg</td>
<td></td>
</tr>
<tr>
<td>Synthyroid .025 mg</td>
<td></td>
</tr>
<tr>
<td>Apo-oxazepam 15 mg</td>
<td></td>
</tr>
<tr>
<td>Traratan Z .0047 mg</td>
<td></td>
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<tr>
<td>Co-alendronate 70 mg</td>
<td></td>
</tr>
<tr>
<td>Cipralex 10 mg</td>
<td></td>
</tr>
<tr>
<td>Ciproxl 1000 mg</td>
<td></td>
</tr>
</tbody>
</table>
Medication Name:
Fucidin cream 2%

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller was a 96 year old woman who suffered a left subdural hematoma after falling and hitting her head on the curb on April 6, 2012. She experienced aphasia, slurred speech, and confusion after her fall and was admitted to an acute care hospital. The faller also had a history of transient ischemic attacks, hypertension, diabetes, and osteoporosis. After her stroke, she recovered well in hospital. Her cognition improved and she became neurologically stable. She was discharged to her home on April 10, 2012.

The faller fell in her living room on June 30, 2012 at 15:57 pm. Following discharge from the acute care hospital, the faller had PSW coming over every morning to get her started with her routine. Faller’s son visited his parents twice a week (Fridays and Saturdays). On the day of the fall, the PSW got her started with her daily routine at 8:00. After breakfast, the faller spent time watching TV in the living room. Faller’s husband received food delivered by Meals On Wheels at 11:00. Faller had lunch in the living room at noon. The faller’s son had come to visit at 14:00 that afternoon. The faller fell asleep while reading a newspaper on her bed. Her son sat and read in a chair by her bed. After faller fell asleep, the son went to the living room and slept on the floor in the space between the coffee table and couch. Usually, her son would keep reading in the bedroom, but on the day of the fall he felt bored and drowsy so decided to take a nap.

When the faller woke up, she saw that her son wasn’t in the bedroom, so she walked to the living room with her walker looking for him. The faller saw the son sound asleep on the floor without a blanket. She thought that he might be cold because he was lying directly under the air conditioner. The faller then fetched a blanket from her bedroom. She left her walker at the entrance of the living room and started walking towards her son through the narrow space between sofa and the table. Faller stood near her son’s feet and reached forward and down to place the blanket over him. While doing that, she over-reached, lost balance, stumbled over son’s feet, rolled over her shoulder and landed on the floor over son’s feet. The son was startled and jumped up quickly to assist his mother. The faller used the couch to pull herself up. Faller’s son made sure that she was alright. She sprained her ankle but did not require medical attention.

Faller and family

After discharge from the acute care hospital the faller returned home and functioned well. Faller lived in a two bedroom neatly maintained apartment with her husband. She was the primary caregiver for her husband who had visual impairment due to cataracts. She was independent in most activities of daily living and received assistance from her son for groceries and meals. Her son visited twice a week and assisted with shopping and outings. The faller was on 8 prescription medications, and suffered from osteoporosis, vertebral fractures, back pain, high blood pressure, and heart conditions.

To go from one end of the living room to the other, the faller had the option to walk through a narrow space between the sofa and coffee table or use her walker and walk through the kitchen. However, the faller believed that she did not need her walker at all times and only required it for certain activities. Because she wanted to remain as independent as possible, she chose not to rearrange the furniture to allow the walker to pass through. This forced her to walk without the walker, and according to the faller, forced her to remain independent.

Community Care Access Centre (CCAC) Involvement

The faller initially began receiving CCAC services in 2009, after complaining to her doctor of shoulder pain and difficulty showering. A case manager at the CCAC assessed the faller for possible need for personal support worker (PSW), physiotherapy (PT), and occupation therapy (OT) services. Faller was receptive of OT and PSW services, however she declined PT because she wanted to discuss need of PT with her family physician. An OT conducted a
Berg Balance Test, which indicated that she had poor balance (Score 27/56), and was at a high risk for falls. She had difficulty standing safely during showers and required support. OT recommended the use of a walker at all times, and the assistance of the PSW with showering. Faller started receiving PSW care for bathing once a week as of Sep 30, 2009.

In March 2011, faller experienced a transient ischemic attack and was admitted to acute care hospital. Due to her high risk of falling, at the time of discharge she was referred to CCAC again for OT services for gait aid education and in-home safety. Although the CCAC does provide home safety assessments, these assessment tools are not standardized and each OT uses assessments at their discretion. In this case, the OT recommended replacement of towel bar in the bathroom with grab bars to provide additional support. The OT also advised the faller of the potential tripping hazards of mats/area rugs and told her to avoid using furniture for support when walking and when reaching. The OT also suggested to faller that she should hold onto solid support surfaces whenever reaching into her fridge, drawers, cupboards, etc. Faller felt safe using the grab bars in bathroom and OT discussed the fall prevention strategies over the phone during follow up. The arrangement of the furniture in the home and the use of the walker while indoors was not assessed.

Between October 2010 and January 2011, faller experienced 2 falls. She also had a slow decline in health. She required more assistance with activities of daily living, so PSW services were increased to 1 hour every day. PSW assisted the faller with breakfast preparation, showering and anything else that she required in the morning as she was weak and had poor balance.

**PT at acute care hospital**

At the time of discharge from acute care hospital, the faller was assessed by PT and OT. Both recommended that additional follow up was not required. At discharge, PT assessment showed that faller had poor dynamic balance but was independent with all activities of daily living. Faller was instructed to use walker during all activities, and to practice walking in her hallway for 30 minutes a day. During the faller’s seven days stay at the acute care hospital, there was a shortage of PT staff on the Neurological unit. PT assessments usually include the Berg Balance Scale (BBS), Timed Up and Go (TUG) test, 2 Minute Walk Test (2MWT) and 10 Minute Walk Test (10MWT) but none of these tests were performed. The faller’s PT at the acute care hospital stated that if at discharge the patient was back to their baseline ability then PT follow-up is not recommended. Because the faller was functioning at baseline levels at the time of discharge from the hospital, she was not referred to the Community Stroke Rehabilitation Team (CSRT) for further support. The CSRT specializes in rehabilitation services for stroke survivors that are provided on longer term and are more extensive than the services provided by the CCAC.

**Arrangement of Living Room Furniture**

The faller’s living room was arranged with a couch on one side and two sofa chairs facing the couch, with a coffee table in the middle. The arrangement of the living room furniture left only a narrow path to get from one side of the living room to the other. Since the couch was too small to sleep on, the faller’s son decided to lie down on the floor in the space between the chair, couch and coffee table. When the faller saw that her son was sleeping on the floor, she fetched a blanket from the bedroom, and left her walker at the entrance of the living room as the walker could not pass through the narrow space between table and sofa.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

- IMG_1232.JPG
- IMG_1233.JPG
- IMG01600-20121004-1506.jpg
Swiss Cheese Report

Organizational Factors:
- There is a shortage of physical therapy staff at acute care hospital.
- Faller is not referred to Community Stroke Rehabilitation Team (CSRT) upon discharge from acute care.
- Discharge team evaluates that faller's function is not sufficiently disabled to qualify for CSRT services.

Supervision:
- When patients are at their baseline function at discharge, PT follow-up is not required.
- Because faller already had a walker, PT recommended that full balance assessment was unnecessary.
- An OT home assessment in March 2011 did not include recommendations for furniture arrangement.
- PT and OT follow-up or home safety assessment were not recommended to faller at discharge from hospital in April.

Preconditions:
- Faller suffered a left subdural hematoma on April 6, 2012.
- Faller has back pain due to osteoporotic vertebral fracture.
- Faller is 96 years old.
- Faller is on nine medications.
- This is the first time son has fallen asleep on the floor.
- Faller requires walker for mobility at all times.
- Table blocks the path to the other end of the room.
- Faller occasionally challenges herself by walking without walker.
- Faller's walker cannot pass through narrow space between table and sofa chair.
- Faller has a history of falling when over-reaching.
- Bending forward aggravates faller's back pain.
- Faller has poor dynamic balance.

Unsafe Acts:
- Faller is discharged from hospital without occupational or physical therapy (OT or PT) follow-up. Apr 10, 2012
- Faller sleeps long hours due to fatigue. Apr 10 - 20, 2012
- Son falls asleep on the floor between the sofa chair and table. 15:05
- Faller leaves walker at the entrance of the living room. 15:53
- Faller reaches forward to put the blanket on son. 15:55
- Faller loses balance. 15:55
Conclusions

The faller was a 96-year-old woman who suffered a left subdural hematoma after falling and hitting her head on the curb on April 6, 2012. After discharge from the acute care hospital the faller returned home and functioned well. Her son visited twice a week and assisted with shopping and outings. The faller fell in her living room on June 30, 2012 at 15:57 pm. The faller’s son had come to visit at 14:00 that afternoon. The faller fell asleep while reading a newspaper on her bed. Her son sat and read in a chair by her bed. After faller fell asleep, the son went to the living room and slept on the floor, in the space between the coffee table and couch. When the faller woke up, she saw that her son wasn’t in the bedroom, so she walked to the living room with her walker looking for him. The faller saw the son sound asleep on the floor without a blanket. She thought that he might be cold because he was lying directly under the air conditioner. The faller then decided to fetch a blanket from her bedroom. She left her walker at the entrance of the living room and started walking towards her son through the narrow space between sofa and the table. Faller stood near her son’s feet and reached forward and down to place the blanket over him. While doing that, she over-reached, lost balance, stumbled over son’s feet, rolled over her shoulder and landed on the floor over son’s feet. The son was startled and jumped up quickly to assist his mother. The faller used the couch to pull herself up. Faller’s son made sure that she was alright.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

- The furniture arrangement of the living room was not assessed by OT when the faller initially started receiving CCAC support in 2009, nor was it reassessed, in March 2011 after a transient ischemic attack, or after her 2012 stroke. The living room furniture was arranged in a way that does not allow the walker to pass between the couch and coffee table. The faller stated that she liked that the furniture blocked the path as she purposely did not want to use her walker at all times. For example, in order to water a plant near the balcony the faller had to either walk between the furniture without the walker or walk around through the kitchen where the walker could pass. Faller's need for independence and perceived safety resulted in frequent episodes of furniture walking. The OT assessments did not include routine adjustments of walking paths blocked by furniture.

- During her week long stay in the inpatient neurology unit, PT assessments did not include the Berg Balance Scale, Timed Up and Go, Two minute or 10 minute walking tests. Since the faller already had a walker it was deemed unnecessary to complete a full balance assessment. At the time of her hospital stay, there was a shortage of PT staff and this may have contributed to minimal PT involvement. Standard practice in hospital was that if at time of discharge a patient returns to baseline, then PT follow-up is not required and tests are not performed.

  - Because PT follow-up was not requested, the CCAC was not involved to reassess the faller's need for PT or OT services, and an opportunity to address faller's post-discharge functional decline, (balance in particular) was missed.

  - Faller was not disabled sufficiently by stroke to qualify for referral to the Community Stroke Rehabilitation Team, which specializes in longer term rehabilitation goals of stroke survivors.

  - On the day of the fall, the faller’s son made a change to the regular routine of his visits. Instead of staying in the bedroom and reading, he went to lay down on the living room floor to take a nap. This was the first time the son had done this.

  - The faller was on eight prescription medications on the day of the fall. She was on medication to control her blood pressure, a side effect of which could be a sudden drop in blood pressure and light-headedness when quickly changing position or reaching. In this case, the faller was over-reaching forward and down, as she was
placing a blanket over her son, and a change in blood pressure may have contributed to her loss of balance.

- Faller also had osteoporosis and vertebral fractures that were easily aggravated by forward bending of the spine. Back pain was another contributing factor to this fall.
Case 16959: Sequence of Events

- **Faller is oriented with no neurological deficits.**
- Faller is not referred to Community Stroke Rehabilitation Team (CSRT) upon discharge from acute care.
- Discharge team evaluates that Faller's function is not sufficiently disabled to qualify for CSRT services.
- **Faller suffers a left subdural hematoma on April 6, 2012.**
- **Faller has back pain due to osteoporotic vertebral fracture.**
- **Faller is 96 years old.**
- **Faller is on nine medications.**
- Faller is not referred to CSRT.
- **Faller is admitted to the neurosurgery unit in acute care hospital, Apr 6, 2012.**
- **Faller is discharged from hospital without occupational or physical therapy (OT or PT) follow-up, Apr 10, 2012.**
- When patients are at their baseline function at discharge, PT follow-up is not required.
- There is a shortage of physical therapy staff at acute care hospital.
- Because Faller already had a walker, PT recommended that full balance assessment was unnecessary.
- **Faller is referred to CSRT upon discharge from acute care.**
- **Faller falls over a curb on the street while walking with her walker and hits her head. Apr 6, 2012.**
- **Faller has aphasia but is able to follow 3-step commands. Apr 8, 2012.**
- **Faller regains her ability to walk with walker. Apr 8, 2012.**
- **Faller is oriented with no speech impairments or neurological deficits. Apr 7 - 10, 2012.**
- Doctor refers Faller to Community Care Access Centre (CCAC) for help with showering, 2011.
- **Faller sleeps long hours due to fatigue. Apr 10 - 20, 2012.**
- **Faller informs doctor about sleeping long hours. Apr 20, 2012.**
- **Doctor recommends rescheduling regular PSW visits. Apr 21, 2012.**
Faller has breakfast. 8:15
Meals on Wheels delivers food. 11:00
Faller reads newspaper while laying in bed. 14:00
Faller’s son comes to visit his parents. 14:00 - 15:00
Faller walks back to her bedroom to get a blanket. 15:52
PSW starts visiting Faller every morning to get her started with her routine. Apr 23-Jun 30, 2012
Faller gets out of bed. Jun 30, 2012, 8:02
PSW arrives to help Faller with showering. 8:06
Faller watches TV in her bedroom. 8:45 - 11:58
Faller has lunch on couch. 12:00 - 12:30
Faller’s husband puts food away in fridge. 11:02
Son reads in Faller’s room in her chair. 14:00 - 15:00
Faller wakes up. 15:50
Faller walks to living room with a 4-wheeled walker. 15:51
Faller sees son sleeping on the floor under air conditioner. 15:52
Faller has fallen asleep on the floor between the sofa chair and table. 15:05
This is the first time son has fallen asleep on the floor.
Faller returns to living room with the blanket. 15:53

Faller leaves walker at the entrance of the living room. 15:53

Faller requires walker for mobility at all times.

Table blocks the path to the other end of the room.

An OT home assessment in March 2011 did not include recommendations for furniture arrangement.

Faller occasionally challenges herself by walking without walker.

Faller's walker cannot pass through narrow space between table and sofa chair.

PT and OT follow-up or home safety assessment were not recommended to faller at discharge from hospital in April.

Faller reaches forward to put the blanket on son. 15:55

Faller has a history of falling when over-reaching.

Bending forward aggravates faller's back pain.

Faller loses balance. 15:55

Faller has poor dynamic balance.

Faller walks towards son through the space between the table and sofa. 15:54

Faller stumbles over her son's feet. 15:56

Faller stands near son's feet with blanket in her hands. 15:55

Faller rolls over to her right shoulder. 15:56
Faller twists her ankle. 15:56
Faller lands on the floor on top of her son's feet. 15:56
Faller's son jumps up. 15:56
Faller lies on the floor on her back. 15:56
Faller gets up on her own holding onto the sofa chair. 15:57
Son ensures faller is okay. 15:58
Faller sustains a sprained ankle but does not seek medical attention.
SFIM Investigative Report

Tripped Over Baby
2.6a Was this person multi-tasking?  No

2.7 Action by the faller prior to loss of balance:
- Rushing
- Walking (task-oriented)

2.8 Type of fall:
- Trip

2.9 Direction of the fall:
- Sideways right
2.10 Environment at the fall location:

☑ Obstacle on the path (clutter, animal, carpet, threshold, assistive device, etc.)

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Socks only

2.13 How did faller get up after the fall?

☐ Alone (self initiated)

2.14 Injury? ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ Yes, please specify:

Faller was rushing in panic to prevent baby from getting outside. Faller is not usually responsible for children supervision.
3.1. Demographics:

Year of birth: 1969  Age Calculated: 43
Gender: Male
Population (Check all that apply): ☑ Acquired brain injury
☐ Stroke survivor

3.2 Falls history:

☑ Rare faller (fell only this one time in the past year)

3.4 Marital status:

☐ Married

3.5 Mental status:

☑ Has fear of falling

3.6 MMSE score:

☑ Not available

3.7 Education:

☐ University completed

3.8 Mobility aids:

☑ Cane ☐ Occasionally

3.9 Other aids used by the faller:

☑ Glasses ☑ for distance

3.10 Medical problem at the time of the fall:

☑ Acquired brain injury ☐ Hemorrhagic
☑ Deconditioning

☑ Muscle weakness

☑ Other, please specify:
Soreness in right shoulder.

3.11 Medications:

2 Number of prescription medications used by the faller on the day of the fall
Medication Name:
Dilantin 150 mg 3 times a day

Medication Name:
Multivitamin

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 42 year old stroke survivor fell at home on July 23, 2012 at 15:15. Like every day, the faller had been resting on the living room couch for most of the morning and afternoon. The faller’s employee, who assisted with the responsibilities on the farm and who was close with the family, came into the room and rested on the adjacent couch. The faller went into the kitchen to make himself a cup of coffee when he noticed that his two year old daughter ran towards the garage door to go outside while his one year old infant was crawling behind her. He yelled to the two year old to close the door behind her so that her baby sister couldn’t get out, but she did not listen and the door was left ajar. Fearing that his infant daughter would injure herself if she got to the steps of the garage, the faller panicked and rushed towards the door. He used the furniture to support himself, dragging his affected left leg, as he hurried towards the door. A large arm chair located beside the door obstructed the faller’s view of the doorway. He did not see his infant daughter at the foot of the doorway and when he reached to close the door he tripped over the baby with his left foot. The faller landed on the floor on his right side, which startled the baby and she began to cry. The employee ran to assist the infant while the faller pulled himself up using the arm chair. No one was injured.

The Faller
The Faller was a 42-year-old man who lived with his wife and six children. The children were ages 12, 10, 8, 7, 2 and 1 years old. The faller worked on a dairy farm owned by the family. On March 4, 2012 he suffered a stroke and had a right fronto-temporo-parietal hematoma for which he underwent surgery. After discharge from the acute care hospital, faller recovered in the stroke unit of a rehabilitation hospital for approximately one month. He was then discharged home. The faller sustained weakness and loss of sensation on his left side, particularly in his left leg. He also had left-side hemiplegia and visual neglect. The faller was deconditioned and had poor muscle strength and postural control as a result of his inactivity since his stroke. He reported slow reaction time and poor foot-eye coordination. Upon returning home, the faller was frequently fatigued and spent most of his days resting and napping on the couch in the living room.

The Environment
The faller and his wife had a very busy household. Before his stroke, the faller spent most of his time working on the farm while his wife cared for their six children and also managed the bookkeeping for the dairy farm. They employed several farm workers part-time, and one worker full-time, to help with the needs of the farm. The family lived in a spacious farm house. The main living room and the kitchen were both one large space. Attached to the living room was the sun room, which functioned as a play room for the children. Because the couple had six children and many employees coming in and out of the house, the main living space of the household was very busy and sometimes hectic. During the summertime, the children were not in school and all six of them were around the home during the day. The children’s play area as well as the living room contained many toys and objects that were often strewn about the floor. The living room contained a couch that faced the television, with two smaller couches/arm chairs on the left and the right. The couch on the right was positioned against the wall, and past the couch was a door that led outside to the garage (see attached photos).

Community Care Access Centre
The faller started receiving care from the Community Care Access Centre (CCAC) following discharge from the rehabilitation hospital on June 27th. He received an initial physical and occupational therapy assessment from the CCAC and was then transferred to the Community Stroke Rehabilitation Team (CSRT). The initial physical therapy assessment included setting a gait progression program, a program to improve walking, strength, and fitness. The occupational therapy assessment included a home safety assessment and safety instruction, equipment recommendations, and suggestions for funding opportunities. As a result of this OT assessment, the faller received a dressing aid, tub transfer chair, bench, and a wheelchair. The occupational therapist did not suggest any modifications to the living environment or the furniture arrangement in the home. Although the CCAC does provide home safety assessments, these assessment tools are not standardized and each OT uses assessments at their
discretion. The faller also received a quad cane on July 6th. After these initial assessments, rehabilitation care was handed off to the CSRT. However, the faller continued to receive assistance from a personal support worker (PSW) assigned by the CCAC twice a week.

Community Stroke Rehabilitation Team
The Community Stroke Rehabilitation Team started to provide rehabilitation services on July 5th (for OT) and July 10th (for PT). The physical therapist administered tests of strength, balance, coordination, endurance, and balance and interpreted the faller’s results on these tests as decent. The faller’s score on the balance scale was 51/56. The PT stated that “most patients who score above 49 or higher do not use gait aids.” The PT did not provide the faller with specific training on using his quad cane, and based on his level of mobility, the PT recommended that it is appropriate to walk without the use of the cane while inside the house. The PT told the faller that it was important for him to feel confident walking on his own, to the best of his abilities. The faller was not given a specific list of activities that he could or could not do without his cane. The PT noted that the faller had good muscle control but had no confidence using his affected leg.

The occupational therapist from the CSRT reviewed the home safety assessment done by the CCAC and checked that the faller had all of the safety equipment that he needed. The OT did not make further safety recommendations for the home. The OT sessions focused on the affected arm/upper limb and vision issues.

The faller and his wife were also seen separately by a social worker from the CSRT. The social worker discussed options for funding while the faller was not able to work on the farm. With the wife, the social worker administered a depression scale as well as a caregiver burden scale. The wife and the social worker also discussed strategies for dealing with the challenges of caring for the six children and the household while the faller recovered. The social worker advised the wife to come up with her own strategies for ways that she could make the affairs of the household run more smoothly. The wife brainstormed three or four strategies, but only one of them could be feasibly carried out. The social worker discussed potential child care options with the wife, but none of these options were pursued. The wife expressed hesitation to send her children to daycare and the social worker did not pursue the matter further. The social worker did not provide child care or caregiver support strategies that were congruent with the wife’s values and resources. The expectation was for the wife to generate solutions to the issue of child care and caregiving on her own, with minimal direction or follow up from the social worker.

Child Care Options
The faller’s brother-in-law and sister-in-law would stay with the family part-time following his stroke. These family members helped to supervise the six children and to run errands. The brother and sister in law spent a few days a week living with the family for a period of two months after the faller returned home. On the day of the fall, these in-laws were not at the house and therefore were not able to supervise the children. When asked how she managed to cope with the increased burden in care giving and responsibilities in the house hold, the wife replied that she simply had to do what needed to be done. When the wife was asked if she felt like she received all of the support she needed from the CCAC and the CSRT, she replied that she received all the support that she could realistically expect. The wife was not inclined to criticize or complain about any gaps between the support she needed and the support she received. The wife and the faller both had the attitude that they could not expect their supervision challenges to be met completely by the CSRT or the CCAC.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

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IMG_1422.JPG
### SFIM
**Case ID: 9100512**  
**Date: 2013-06-06**  
**Subject #: 16958**

#### Swiss Cheese Report

### Organizational Factors:
- Faller and family are expected to review home safety checklist on their own.
- There is no organizational follow-up (from CSRT or CCAC) on child care or caregiver respite options.
- OT safety assessment does not include assessment of furniture.

### Supervision:
- Social worker provides faller with home safety assessment without going over it with him.
- Falls prevention program was not created or discussed with faller and family.
- Social worker learns that faller's brother-in-law and his wife are helping to care for children while faller recovers.
- Child care options are discussed once with faller's wife, but there is no follow up.
- Alternative child care options are not pursued.
- Faller's wife is expected by social worker to generate her own solutions to her care giver challenges.
- OT leaves without recommending any changes regarding toys as obstacles in the household.
- Faller's wife is busy and unable to watch the two youngest children.
- Faller and farm hand (who are dozing off) are supervising two toddlers.
- Faller’s brother-in-law and wife are not available to watch children.

### Preconditions:
- Neither faller nor family reviews home safety checklist.
- Faller and wife have six children (aged 1 - 12 years).
- Living room is used as a play area for children and is cluttered with furniture and toys.
- Faller spends most of his time resting on a couch in the living room.
- Faller's mobility is impaired.
- Faller has decreased sensation in left side.
- Faller is deconditioned.
- Faller has poor muscle strength.
- Faller was diagnosed with right frontotemporoparietal hematoma. Mar 4, 2012
- Door leads outside to open garage and driveway.
- There are five steps from the doorway to the garage floor.
- Baby is crawling near open doorway.
- Faller is in a hurry.
- Faller has poor postural control.
- Faller has slow reaction time.
- A large armchair obstructs pathway to door.
- Faller has visual neglect on left side.
- Faller has left side hemiplegia.
- Faller has poor foot-eye coordination.
- Faller is unable to dorsiflex left ankle and his foot hangs while walking.
Unsafe Acts:

- Social worker from CSRT contacts faller to conduct initial assessment.
- Social worker discusses child care options with faller and wife.
- Occupational therapist from CSRT reviews safety assessment by CCAC. Jul 5, 2012
- Faller watches TV and naps on couch. 13:00 - 15:00
- Fallers daughters (two years old and infant) play unsupervised in living room. 15:00
- Daughter leaves door ajar. 15:12
- Faller rushes from the kitchen to living room to close door before baby gets outside. 15:11
- Faller moves to the left around armchair to reach door. 15:14
- Faller does not see baby behind chair.
- Faller loses control of his balance.
- Faller trips over baby with left foot. 15:15
Conclusions

The faller, a 42 year old stroke survivor fell at home on July 23, 2012 at 15:15. Like every day, the faller had been resting on the living room couch for most of the morning and afternoon. The faller’s employee, who assisted with the responsibilities of the farm and who was close with the family, came into the room and rested on the adjacent couch. The faller went into the kitchen to make himself a cup of coffee when he noticed that his two-year-old daughter ran towards the garage door to go outside while his one-year-old infant was crawling behind her. He yelled to the two year old to close the door behind her so that her baby sister couldn’t get out, but she did not listen and the door was left ajar. Fearing that his infant daughter would injure herself if she got to the steps of the garage, the faller panicked and rushed towards the door. He used the furniture to support himself, dragging his affected left leg, as he hurried towards the door. A large arm chair located beside the door obstructed the faller’s view of the doorway. He did not see his infant daughter at the foot of the doorway and when he reached to close the door he tripped over the baby with his left foot. The faller landed on the floor on his right side, which startled the baby and she began to cry. The employee ran to assist the infant while the faller pulled himself up using the arm chair. No one was injured.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* Due to a right fronto-temporal-parietal hematoma, the faller suffered from left sided hemiplegia. He had poor postural control, poor foot-eye coordination, decreased sensation in his left side as well as visual neglect on his left side. The faller was unable to dorsiflex his left ankle, his foot hung while walking which made walking a difficult task as he would have to drag his left foot along. The faller also had poor muscle strength and some deconditioning, a slow reaction time and his mobility was impaired. These factors all contributed to his inability to navigate the environment, particularly at times when he needed to move in a hastened manner.

* The faller spent most of his days resting on the couch in the living room, watching television or napping. On the day of the fall, the faller’s two youngest daughters were playing in the living room. The faller’s wife had stepped out of the room briefly and the faller was supervising the children as he lay on the couch. The living room and the kitchen were one big space and the sun room where the children played was attached to the kitchen/living room area. The sunroom was full of the children’s toys and some of these toys were also strewn on the floor of the living room. The living room, the kitchen and the sunroom were cluttered and cramped with furniture and toys and occasionally with many people coming in and going out.

* The living room has a door that exits into the garage and driveway of the house. The doorway leads to five concrete steps between the living room and the garage door. A large arm chair was located beside the doorway, obstructing the view of the floor in front of the doorway from the kitchen.

* The faller and his wife had six children, ranging in age from 1 year to 12 years of age. On the day of the fall, the faller’s two year old daughter and 1-year-old daughter were left playing under the supervision of the faller. The faller feared for his 1-year-old daughter’s safety as she crawled towards the steps of the garage.

* The faller’s brother-in-law and his wife helped with the caregiving responsibilities of the children after the faller was discharged home from the hospital. They lived part-time in the faller’s home for 2 months to assist the faller’s wife with taking care of the children and the faller.

* On the day of the fall, the eldest children were outside playing, the faller’s wife had stepped away from the living room and kitchen space for a moment and the faller’s brother-in-law and his wife were out running errands. The faller was solely responsible for supervising the youngest children.

* Although a home safety assessment was completed by the OT from CCAC and later passed on to the CSRT, the social worker from the CSRT failed to review the assessment with the faller and his family. The social worker left a home safety checklist after her initial visit, but it was never looked at again by the faller and his family. In addition, the OT home safety assessment failed to include the assessment of furniture and clutter in the living space.
* To address the burden of care and the increasing care responsibilities of the faller’s wife, the CCAC discussed child care options with her. However, she did not find any of the proposed options feasible or suitable and no further alternatives were pursued. The faller’s wife recognized that her care provider workload substantially increased after her husband’s hospitalization and that now she not only had to care for six children by herself but also her ailing husband and the management of the family farm. She did not put blame on any one person or organization for her situation but she appeared stressed and burnt out. She believed that she was receiving as much support as she could realistically expect, even though this support was not meeting her needs.
Faller recovers from acute stage of illness with left side weakness and cognitive impairments, Mar 28 - Apr 12, 2012

Faller is discharged from rehabilitation hospital to his farm house. Jun 27, 2012

The Community Care Access Centre (CCAC) case manager conducts an initial assessment in hospital, upon discharge. Jun 27, 2012

Social worker from CSRT contacts faller to conduct initial assessment.

Social worker provides faller with home safety assessment without going over it with hints.

Faller and family are expected to review home safety checklist on their own.

Neither faller nor family reviews home safety checklist.

Falls prevention program was not created or discussed with faller and family.
PT recommends faller use a quad cane while walking a week with PT and 1-2 appointments a week with rehabilitation therapist.

Jul 10 - Jul 23, 2012

Faller wakes up. Jul 23, 2012, 8:30
Faller has breakfast and takes medications. 8:45 - 9:15
Faller watches T.V., sleeps, and rests on couch in living room. 9:15 - 12:00
Faller has lunch in kitchen. 12:00 - 13:00

Faller has one appointment a week with PT and 1.5 appointments a week with rehabilitation therapist. Jul 10 - Jul 23, 2012

Faller continues with therapy services and rests at home. Jul 10 - Jul 23
Faller spends his days resting on couch in living room. Jun 27 - Jul 23
Faller’s brother-in-law and wife help to care for six children while faller recovers.

Social worker discusses child care options with faller and wife.

Social worker learns that faller’s brother-in-law and his wife are helping to care for children while faller recovers.

Child care options are discussed once with faller’s wife, but there is no follow up.

Alternative child care options are not pursued.

Faller’s wife is expected by social worker to generate her own solutions to her caregiver challenges.

There is no organizational follow-up (from CSRT or CCAC) on child care or caregiver respite options.

OT leaves without implementing changes to household arrangement. Jul 5, 2012

OT leaves without recommending any changes regarding toys as obstacles in the household.

Faller and wife have six children (aged 1 - 12 years).

Living room is used as a play area for children, and is cluttered with furniture and toys.

Faller spends most of his time resting on a couch in the living room.
Faller goes to kitchen to get a cup of coffee. 15:00

Faller's mobility is impaired.

Faller has decreased sensation in left side.

Faller is deconditioned.

Faller has poor muscle strength.

Faller was diagnosed with right frontotemporo-parietal hematoma. Mar 4, 2012

Door leads outside to open garage and driveway.

There are five steps from the doorway to the garage floor.

Baby is crawling near open doorway.

Hired farm worker comes inside to rest on second couch in living room. 13:00

Faller's wife is busy and unable to watch the two youngest children.

Faller and farm hand (who are dozing off) are supervising two toddlers.

Faller’s brother-in-law and wife are not available to watch children.

Two year old daughter goes outside through living room door. 15:12

Faller tells daughter to close the door behind her. 15:12

Daughter leaves door ajar. 15:12

Faller stands at kitchen counter and drinks coffee.
Baby crawls towards open door. 15:13

Faller rushes from the kitchen to living room to close door before baby gets outside. 15:11

Faller is in a hurry.

Faller has poor postural control.

Faller has slow reaction time.

Faller does not see baby behind chair.

Faller trips over baby with left foot. 15:15

Faller has visual neglect on left side.

Faller has left side hemiplegia.

Faller loses control of his balance.

Faller lands on the floor on his right side. 15:15

Faller has poor foot-eye coordination.

Faller is unable to dorsiflex left ankle and his foot hangs while walking.

Baby starts crying. 15:15

A large armchair obstructs pathway to door.

OT safety assessment does not include assessment of furniture.

Faller moves to the left around armchair to reach door. 15:14

Farm worker wakes up and rushes to check if baby is okay. 15:15

Baby is startled but unharmed. 15:15

Faller moves across living room, supporting himself against furniture. 15:14

Faller pulls himself up using chair. 15:16

Faller walks towards couch. 15:16

Faller sits on the couch for five minutes to ensure that he is alright. 15:16

Faller sits on the couch. 15:16
SFIM Investigative Report

Picking Up Mail
Fall Information

2.1 Date of the fall: 2012-07-25
2.2 Day: Tuesday
2.3 Time of fall: 24-hour clock
                   14:15
2.4 Witnesses:   Witnessed
                   Number of people at the scene? 1
2.5 Location of the fall:
                   Outdoors
                   Parking lot, driveway
2.6 Activity at the time of the fall:
                   Walking
2.6a Was this person multi-tasking? Yes
2.7 Action by the faller prior to loss of balance:
               ✓ Carrying an object
               ✓ Rushing
               ✓ Walking (task-oriented)
2.8 Type of fall:
                   Trip
2.9 Direction of the fall:
                   Forward
2.10 Environment at the fall location:

☑️ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☑️ Cane

2.12 Footwear worn by the faller at the time of the fall:

☑️ Other

Sandals.

2.13 How did faller get up after the fall?

☐ Assisted by another person

☑️ EMS

Please specify how the faller was assisted:

☑️ Manual lift (no aide by device)

2.14 Injury? ☐ Yes

2.15 Injury severity:

☐ Serious - required substantial medical attention (e.g. sprain, fracture, joint dislocation, head injury, loss of consciousness, open wounds, internal injuries)

2.16 Injury type:

☑️ Bruise

☑️ Bump on the head/concussion

☑️ Laceration/cut

☑️ Open wound

☑️ Pain

☑️ Other, please specify:
Subdural hematoma.

2.17 Injury location:

- Head and neck
- Face, eyes, nose
- Arm, elbow Left
- Leg, knee, foot, toe(s) Left

2.18 Type of medical attention received:

- EMS Took to hospital
- Admitted to hospital for one or more days

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

Yes, please specify:
First time faller was getting the mail since being discharged home.
SFIM
Case ID: 9100612 Date: 2013-06-06 Subject #: 17918

Information About the Faller

3.1. Demographics:

Year of birth: 1939 Age Calculated: 73
Gender: Male
Population (Check all that apply): 
- Senior
- Acquired brain injury
- Cognitive impairment (Check only if permanent)
- Stroke survivor

3.2 Falls history:

- Multiple faller (falls regularly)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Number of falls in the last week: 1
Number of falls in the last month: 3
Number of falls in the last year: 6

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

- Unknown

3.4 Marital status:

- Married

3.5 Mental status:

- Diagnosed with dementia
- Confused or disoriented

3.6 MMSE score:

- 19

3.7 Education:

- Secondary school completed

3.8 Mobility aids:
Montreal Cognitive Impairment Score (MoCA < 26): Not available

3.11 Medications:

16. Number of prescription medications used by the faller on the day of the fall

Medication Name: Zopiclone 7.5 mg

Medication Name: Quetiapine fumarate 25mg

Medication Name: Levetiracetam 750mg

Medication Name: Perindopril Erbumine 8mg

Medication Name: Omeprazole 20mg
<table>
<thead>
<tr>
<th>Medication Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galantamine 16mg</td>
</tr>
<tr>
<td>Amlodipine Besylate 10mg</td>
</tr>
<tr>
<td>Metformine HCL 500mg</td>
</tr>
<tr>
<td>Crestor 10mg</td>
</tr>
<tr>
<td>Ferrous gluconate 300mg</td>
</tr>
<tr>
<td>Phenytoin SOD 100mg</td>
</tr>
<tr>
<td>Metoprolol tart 50mg</td>
</tr>
<tr>
<td>Hydrochlorothiazide 25mg</td>
</tr>
<tr>
<td>Clonidine HCL 0.1mg</td>
</tr>
<tr>
<td>TYLENOL</td>
</tr>
<tr>
<td>DILANTIN</td>
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</tbody>
</table>

0 Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 72 year old right handed gentleman fell on the driveway of his house on July 25, 2012 at approximately 14:15. This was the second fall resulting in serious head injury that this gentleman experienced since the beginning of 2012. Both falls led the faller to seek medical attention in the emergency room and admission to the hospital. On the day of the fall, the faller had an uneventful morning consisting of normal activities such as eating breakfast and resting on the couch. In the afternoon, the faller accompanied his wife to her mammogram appointment and later to the butcher shop. When they returned home after their busy afternoon, the faller’s wife was getting grocery bags out of the trunk of the car when she noticed her husband walking down their driveway, towards the mailboxes situated across the street. She warned the faller not to pick up the mail and that she would go herself later, but he did not listen. After some bickering the faller rushed towards the mailbox, confident that he was capable of performing such a simple task. He took 5-6 steps on the cobblestone driveway using his cane, then switched his cane from his right hand to his left hand so that his right hand was free to reach into his right pant pocket for the mailbox keys. As he was performing these tasks, the faller lost his footing and consequently lost his balance. He fell forward and landed on the ground on his left side. The impact of the fall caused the faller’s glasses to break and the metal frame to cut the skin near his left eyebrow. The sound of the impact and the sight of blood scared the faller’s wife and she rushed towards him, dropping everything on her way. She shook the faller to make sure he was breathing and yelled for help. A nearby neighbor heard the commotion and rushed outside to assist. She called an ambulance and within a couple of minutes the paramedics arrived at the scene and transported the faller to the emergency room. Fall did not report losing consciousness but he was hospitalized for 2 days. This fall resulted in a new small right tentorial smear subdural hematoma and the faller received 2 sutures for his eyebrow laceration.

The faller
This 72 year old gentleman was admitted to the Intensive Care Unit (ICU) with hematoma after a fall on April 2, 2012. He fell in the bathroom and was unconscious when his wife found him. He was intubated and ventilated, a CT angiogram done on April 3, 2012 showed acute right frontal parietal subdural hematoma. The CT angiogram also demonstrated a small aneurysm. For the first 2 weeks of his hospital stay, he was in a coma in the ICU. He did not require neurosurgical evacuation given the small size of the subdural hematoma. He was also monitored for a number of other medical issues throughout his prolonged hospitalization (April 2, 2012-June 13, 2012). These issues included: Seizures. On April 4, the faller developed focal seizures consisting of clonic activity involving the face and left arm with some eye deviation. Seizures increased up to 20 times or more per day. The faller was reviewed by the epilepsy team on several occasions for adjustment of anticonvulsant medications; Diabetes (since 2004); Hypertension; Hyperlipidemia (since 2005); Thrombocytopenia; Chronic insomnia (since 2006); Mixed dementia (Alzheimer disease plus cerebrovascular disease since 2004). The faller was on 16 prescription medications, some of which caused drowsiness.

Given the faller’s poor neurological status early on in his hospitalization, plans were in place for long term care. However, the faller demonstrated significant neurological improvement in the last few weeks of his hospital stay. Rehabilitation was considered, however, the faller continued to improve to baseline status. Thus, arrangements were made for the faller to be discharged home in the care of his wife with CCAC support.

CCAC
At the time of discharge on June 13, 2012, the faller was mobilizing independently with a walker. CCAC initially provided a total of three physiotherapy sessions and three occupational therapy sessions to recommend improvements to the bathroom and other areas of the home. Dressing and showering services were refused by the faller’s wife. At the time the fall was investigated, the faller was no longer receiving in-home services from CCAC. He was attending a CCAC adult day program once a week where he participated in supervised programming in a group setting for part-of-the-day. The adult day programs provided by CCAC are specifically designed for dependent adults, such as the frail elderly, individuals with Alzheimers, or individuals with disabilities.
Environment
The fall occurred on the faller’s 2-car garage driveway just outside their bungalow style town home. It was a bright and sunny summer afternoon and the driveway was clear of any debris or objects. A central mailbox unit with mailboxes for all 20 townhomes on the street was located in the middle of the street across from the faller’s home. This mailbox unit was located 25 meters away from the faller’s driveway.

Recurrent falls and Assistive devices
The faller reported that he has had approximately six falls over a period of 2-3 months (from April-July), two of which resulted in subdural hematomas (including the investigated fall). The faller described these falls as mostly mechanical and did not describe any syncopal symptoms. During his hospitalizations, orthostatic vitals did not reveal any significant changes that would point to a syncopal cause for his recurrent falls. Physiotherapy at the hospital noted that his mobility was quite good, as long as he was using his walker and cane. However, when the faller was at home and at the time of the fall he was not using his walker, and his cane was in the wrong hand.

Chronic sleep difficulties
Faller had difficulty falling and staying asleep. He often woke up in the middle of the night and wandered around the house, resting periodically on the couch until he finally fell asleep on the couch in the early hours of the morning. His wife usually found him asleep on the couch. He had been on various sleep medications for his chronic sleep difficulties but none seemed to help his inability to sleep at night. The faller did not sleep through the night and felt fatigued during the day. He often napped during the daytime. The faller was on 16 medications for various health conditions. Three different sleep medications were used, and two medications used for Alzheimer’s also caused drowsiness and were used as sleep aids. Also, one of the blood pressure medications that the faller was taking, caused dizziness and fatigue as a side effect.

Caregiving
The faller does not use the telephone and is highly dependent on his wife for all activities of daily living and care. The faller and his wife had no children and the only family in town was the faller’s sister who was estranged. Since he had been discharged home after his fall in the bathroom in April, and also due to his dementia, the faller’s wife never left the faller alone. If she needed to leave the house, she would take him along with her. The faller’s wife also suffered from a number of chronic health conditions including breast cancer and arthritis, however, she did all the shopping, cooking and cleaning in the house by herself. In addition, she managed their finances, drove to and from appointments and had the responsibility of timely administration of medications for both herself and her husband. The faller no longer drove and his wife sold his car while he was in the hospital as she believed that he was not going to be coming home. Although the faller is continent and is able to feed himself, he had some difficulty with visuospatial skills and executive functioning. His wife had to lay out his clothes but he was able to put them on himself. His wife also assisted him with grooming. The faller lacked insight into the fact that his wife was stressed as his caregiver. He was not willing to consider respite stay but was going to an adult day program provided by the CCAC once a week. This provided the faller’s wife with a small, half-day break. The CCAC suggested a nursing home for the faller but the faller’s wife refused, stating that she believed nursing homes are dirty and people are mistreated. She believed that she could care for him herself but she also stated that she was very tired and discontent with the minimal support she received from the CCAC. When she asked for support with cleaning services, CCAC refused and explained that this service was discontinued due to budget cutbacks. The CCAC provided the faller’s wife with a list of vendors who offered cleaning services. She was hesitant to speak out about her dissatisfaction with the CCAC in fear that any support or services that they were presently receiving, such as the adult day program, or any services that they might need in the future would be taken away.
Faller and his wife receive minimal support from CCAC due to CCAC’s scarce resources.
CCAC budget cuts eliminated cleaning services previously provided to clients in need.
The Alzheimer's Society is not involved with this family because faller's wife has not reached out for additional support.
Positioning of mail boxes in suburban townhouse neighbourhoods does not account for needs and abilities of older residents.

Faller's wife attempts to preserve her independence and dignity for her husband.
Faller's wife is fearful that CCAC might cut off all services if she expresses her discontent with received minimal support.
Wife doesn't have another option for the supervision of her husband during her medical appointments.
Faller's wife is in need of respite care.
Faller's wife is sole caregiver for faller.
Faller's wife is unaware of additional resources available to her as a care provider.

Dressing and showering services offered by CCAC were refused by faller's wife.
Faller was diagnosed with Alzheimer's disease in 2006.
Faller uses a cane instead of walker for outdoor activities.
Mailbox is across street, 25 m away from driveway.
Faller is hungry because he hasn't eaten anything for over 5 hours.
Faller has Type 2 diabetes.
Faller is in a hurry.
Faller wants to get to the mailbox before his wife.
Faller doesn't listen to his wife.
Faller is overconfident in his abilities due to cognitive impairment.
Faller is unstable without the support of his cane.
Faller is multitasking.
Faller is fatigued.
Faller is on 11 prescription medications.
Faller has general muscle weakness.
Faller has history of falling.
Faller suffered a subdural hematoma.

CCAC Case manager prescribes a total of three physiotherapy and three occupational therapy sessions. Jul 2 - Jul 16, 2012
Wife brings faller along with her to regular mammogram appointment. 11:00-13:00
Faller goes to check the mail. 14:13
Faller rushes to reach the mailbox. 14:14
Faller passes cane to his left hand. 14:13
- Faller reaches into right pocket for the mailbox key while walking. 14:14
- Faller trips over his own feet. 14:14
- Faller loses balance. 14:14
The faller, a 72-year-old right handed gentleman fell on the driveway of his house on July 25, 2012 at approximately 14:15. This was the second fall resulting in serious head injury that this gentleman experienced since the beginning of 2012. Both falls led the faller to seek medical attention in the emergency room and admission to the hospital. On the day of the fall, the faller had an uneventful morning consisting of normal activities such as eating breakfast and resting on the couch. In the afternoon, the faller accompanied his wife to her mammogram appointment and later to the butcher shop. When they returned home after their busy afternoon, the faller’s wife was getting grocery bags out of the trunk of the car when she noticed her husband walking down their driveway, towards the mailboxes situated across the street. She warned the faller not to pick up the mail and that she would go herself later, but he did not listen. After some bickering the faller rushed towards the mailbox, confident that he was capable of performing such a simple task. He took 5-6 steps on the cobblestone driveway using his cane, then switched his cane from his right hand to his left hand so that his right hand was free to reach into his right pant pocket for the mailbox keys. As he was performing these tasks, the faller lost his footing and consequently lost his balance. He fell forward and landed on the ground on his left side. The impact of the fall caused the faller’s glasses to break and the metal frame to cut the skin near his left eyebrow. The sound of the impact and the sight of blood scared the faller’s wife and she rushed towards him, dropping everything on her way. She shook the faller to make sure he was breathing and yelled for help. A nearby neighbor heard the commotion and rushed outside to assist. She called an ambulance and within a couple of minutes the paramedics arrived at the scene and transported the faller to the emergency room. Faller did not report losing consciousness but he was hospitalized for 2 days. This fall resulted in a new small right tentorial smear subdural hematoma and the faller received 2 sutures for his eyebrow laceration.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller experienced frequent falls, two of which resulted in subdural hematomas and required hospitalizations. He had muscle weakness, osteoarthritis, Type 2 Diabetes, Alzheimer’s disease, seizures and chronic insomnia accompanied by daytime fatigue. Due to these reasons, the faller’s wife never left the faller unsupervised and had to take him with her when she ran errands or went to her own medical appointments.
* The faller suffered from chronic insomnia and often felt fatigued. On the day of the fall, the faller had been out with his wife all afternoon, accompanying her to her mammogram appointment and also to the butcher shop. He had not slept well the night before and was tired. Several hours had passed since he last ate and although his exact blood-glucose levels at the time of the fall are not known, his hunger added to his fatigue.
* Due to cognitive impairment (from his dementia and subdural hematoma), the faller often did not listen to his wife’s instructions and was overconfident in his abilities to complete tasks that he used to independently. The faller and his wife argued and bickered often and at the time of the fall, he was in a hurry to prove to his wife that he was still capable of picking up the mail by himself.
* The PT at the hospital recommended a rollator walker for outdoor use but the faller did not use his walker and instead used a cane. For him, the walker was inconvenient and the cane was easier to use. He needed his cane for support at all times. At the time of the fall, he was using his cane but switched it from his right to left hand so that he could reach into his right pant pocket to get his mailbox keys. Therefore, at the time of the fall, he did not have the support of his cane.
* The central mailbox unit, where all mailboxes for the 20 townhomes on the street, was located 25 meters away from the faller’s driveway. This posed a problem for both the faller and his wife because both suffered from arthritis and because the faller was unsteady on his feet. It was a long distance to walk to retrieve their mail.
* After his first fall and subsequent long hospitalization period the faller was discharged home with minimal CCAC support. Because the faller’s neurological capacity had returned back to baseline, he was deemed eligible to go back home in the care of his wife.
* CCAC provided the faller with three PT and three OT sessions. A home assessment was done and recommendations regarding bathroom grab bars were made. Dressing and showering services were refused as the
The faller and his wife felt more comfortable doing this themselves.
* The faller and his wife had no children or relatives and the faller’s wife was the sole caregiver for the faller. She suffered from many chronic health conditions herself, including breast cancer and arthritis. She was stressed and tired with her increasing responsibilities caring for her husband and herself, as well as taking care of the home and finances. She was in need of respite care. However, the faller was only provided with a half-day adult day program by the CCAC, once a week. This was the only time the faller’s wife was away from the faller. She did not think a nursing home was a viable option but acknowledged that she needed help and support in caring for her husband.
* When the faller’s wife requested house cleaning support from the CCAC they refused as they no longer provided these services due to budget cutbacks. They provided the faller’s wife with a list of vendors who offered cleaning services. These services had to be paid for out-of-pocket by the faller and his wife.
* The faller’s wife felt dissatisfied with the level of support she was receiving from the CCAC but was reluctant to share this information as she feared that they would be cut off from all services if she said anything negative.
Faller experiences a fall on sidewalk behind his house. Feb 1, 2012

He hits his head against the wall as he falls in washroom. Apr 2, 2012

Community Care Access Centre (CCAC) Case Manager assesses the faller. Jun 27, 2012

CCAC Case manager prescribes a total of three physiotherapy and three occupational therapy sessions. Jul 2 - Jul 16, 2012

Faller is transferred to an acute care hospital by ambulance. Apr 2, 2012

He is diagnosed with right subdural hematoma and small aneurysm. Apr 2, 2012

He lies on bathroom floor, unconscious and bleeding from his head. Apr 2, 2012

Faller's wife calls ambulance. Apr 2, 2012

Faller's wife is fearful that CCAC might cut off all services if she expresses her discontent with received minimal support.

Faller is discharged home. Jun 13, 2012

His progress is slow but steady. Apr 2 - Jun 13, 2012

He recovers from stroke at home. Jun 13 - Jul 24, 2012

Faller is unable to sleep during the night. Jul 24, 2012

Faller and his wife receive minimal support from CCAC due to CCAC's scarce resources.

Dressing and showering services offered by CCAC were refused by faller's wife.

Faller's wife attempts to preserve her independence and dignity for her husband.

Faller’s wife is fearful that CCAC might cut off all services if she expresses her discontent with received minimal support.

CCAC budget cuts eliminated cleaning services previously provided to clients in need.
Faller and his wife stop by a butcher shop to get some sausages. 13:00-14:10

Wife brings faller along with her to regular mammogram appointment. 11:00-13:00

Faller was diagnosed with Alzheimer's disease in 2008.

Wife doesn't have another option for the supervision of her husband during her medical appointments.

Faller's wife is in need of respite care.

Faller's wife is sole caregiver for faller.

The Alzheimer's Society is not involved with this family because faller's wife has not reached out for additional support.

Faller's wife is unaware of additional resources available to her as a care provider.

They return home. 14:10

Wife parks car in garage. 14:11

She goes to get sausages out of trunk of car. 14:12

Faller gets out of car. 14:12

He has breakfast. Jul 25, 8:00-9:00

He rests on the couch. 9:00-11:00
Faller takes 5-6 steps on the driveway while using his cane.

Faller is multitasking.

Faller has Type 2 diabetes.

Positioning of mail boxes in suburban townhouse neighbourhoods does not account for needs and abilities of older residents.

Faller passes cane to his left hand.

Faller reaches into right pocket for the mailbox key while walking.

Faller trips over his own feet.

Faller loses balance.

Faller has general muscle weakness.

Faller has history of falling.

Faller suffered a subdural hematoma.

Wife hears the sound of impact on the ground.

She rushes to faller and shakes him to see if he is breathing and shouts for help.
A neighbour hears voices and comes to assist. 14:17

Neighbour calls an ambulance. 14:17

Ambulance arrives. 14:19

Ambulance takes faller to acute care hospital where faller is hospitalized for 2 days. 14:20
SFIM Investigative Report

Feeling Dizzy, Near Fall in Shower
SFIM
Case ID: 9100712 Date: 2013-06-06 Subject #: 18758

Fall Information

2.1 Date of the fall: 2012-11-30
2.2 Day: Wednesday

2.3 Time of fall: 24-hour clock
   11:00

2.4 Witnesses: Un-witnessed

2.5 Location of the fall: Indoors
   Private Residence
   Bathroom

2.6 Activity at the time of the fall:
   Bathing or showering

2.6a Was this person multi-tasking? No

2.7 Action by the faller prior to loss of balance:
   Turning

2.8 Type of fall:
   Near fall - no landing

2.9 Direction of the fall:
   Forward
2.10 Environment at the fall location:

☑ Wet/icy/slippery surface

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Bare feet

2.13 How did faller get up after the fall?

☐ Not applicable (check only if near fall)

2.14 Injury? ☐ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No
Information About the Faller

3.1. Demographics:

Year of birth: 1957 Age Calculated: 55
Gender: Female
Population (Check all that apply): Acquired brain injury

3.2 Falls history:

Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Unknown

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

Number of near falls in the past week: 20
Number of near falls in the past month: 80

3.4 Marital status:

Married

3.5 Mental status:

Normal, alert and oriented

3.6 MMSE score:

Not available

3.7 Education:

College or equivalent partial

3.8 Mobility aids:

Assistance by another person Occasionally

3.9 Other aids used by the faller:
☑ Bath bench/shower seat

☑ Glasses ☑ for distance ☑ for reading

☑ Shower chair

3.10 Medical problem at the time of the fall:

☑ Arthritis ☑ Osteoarthritis

☑ Blood pressure (high or low)

☑ Dizziness or vertigo

☑ Pain

☑ Stroke Functional Independence Measure Score (Maximum score 126):
  ☑ Not available

  Montreal Cognitive Assessment Score (Maximum score 30):
  0

  Montreal Cognitive Impairment Score (MoCA < 26):
  ☑ Not available

☑ Other, please specify:
Generalized anxiety disorder, feeling overwhelmed.

3.11 Medications:

4 ☑ Number of prescription medications used by the faller on the day of the fall

Medication Name:
Coversy 4 mg in morning

Medication Name:
Cymbalta 60 mg in morning

Medication Name:
Tylenol 3 30 mg 3 x daily

Medication Name:
Hydromorph Contin 3 mg

0 ☑ Number of over-the-counter medications used by the faller on the day of the fall
The faller, a 55 year old woman, experienced a near fall while in the shower of her home on November 30, 2012 at 11:00. The faller suffered a subarachnoid hemorrhage (SAH) on April 22, 2012 and was admitted to the acute care hospital. She was discharged home on May 15, 2012 with a referral to the Community Stroke Rehabilitation Team (CSRT). The day of the near fall was completely normal for the faller. In fact, the near fall was a normal event for the faller, as she experienced a loss of balance 3-4 times a day. On the day of the near fall, the faller was washing her hair in the shower. While her eyes were closed, she turned around to face the front of the shower when she lost balance and pitched forward towards the shower curtain. She grabbed onto the shower curtain for support and held on until the dizziness passed and she had regained her balance. The faller had the expectation that she would continue to deal with her daily losses of balance in this way.

The faller
The faller was a pleasant 55-year-old woman, who lived at home with her husband. The faller experienced a SAH after awaking in the night from a bad dream with severe pain in her neck and shoulders. Following admission to the hospital, she underwent two angiogram procedures, which were both negative for any vascular abnormality. After convalescing in the hospital for 3 weeks, the faller was discharged home with follow up CT scan and angiogram scheduled in one month time. The faller previously suffered from breast cancer, osteoarthritis, Celiac disease, and hypertension. From her test results, the faller’s health care team concluded that her risk for a future bleed was extremely low. Upon discharge, she was told that she would be able to return to her part-time job.

After the SAH, the faller started to experience frequent dizzy spells and loss of balance (approximately 20 occurrences in the past week). The faller also experienced neurological issues involving her ability to process visual information. The faller described difficulties of being easily “overwhelmed” by visual input. She found that even simple tasks like going to the grocery store or driving in a car were difficult, as she had problems making sense of all the movement and noise. As a result, she experienced dizziness and headaches when exposed to too much visual information. She also experienced dizziness when she closed her eyes. The high frequency of near falls was due to frequent dizzy spells that started after the SAH, especially when turning her head. Dizzy spells were also very common when the faller was in the shower, specifically, when turning her head to wash her hair.

The faller was taking four different prescription medications for high blood pressure, generalized anxiety disorder and pain. All four medications list dizziness, light headedness and fatigue as side-effects. The faller was taking these same medications before she experienced SAH, but never experienced dizziness.

Supervision and family support
The faller relied primarily on her husband for care and support. The husband was her sole support when going out to run errands or complete tasks. The faller’s husband was aware of the faller’s visual difficulties. However, the faller did not mention to her husband that she experienced frequent near falls and loss of balance while in the shower, and while performing other activities of daily living. The faller stated that she did not want her husband to worry about her more than he already did. As a result, she chose to deal with near fall experiences on her own. The faller had two daughters who called and checked up on her often. One daughter lived in the same city as the faller, but just as the husband, she was unaware of the faller’s frequent near falls.

Community Stroke Rehabilitation Team (CSRT)
Clinicians employed by the Community Stroke Rehabilitation Team (CSRT) are independently contracted to work as a team and share information about a client through weekly meetings. Upon discharge from the hospital, the faller started receiving services from the CSRT on June 20, 2012. The entire CSRT team, including a nurse, speech language pathologist, social worker, occupational and physical therapist, visited the faller together on June 20, 2012 for an initial assessment. Her most frequent visits were with the occupational therapist (OT). The faller received occupational therapy once a week from the CSRT from June 20th until August 30th, 2012 when care from the CSRT was discontinued. The OT provided the faller with a shower seat to use while showering and taught her strategies to manage dizziness. However, the faller said that she did not like to use the bench all the time, and preferred to
only use it when shaving her legs. An example of these strategies was to spread and brace her feet, and bounce lightly on her knees when she felt dizzy, in order to tell her brain “I’m not falling”. The faller did not clearly communicate her difficulty in the shower with the OT and the OT did not specifically ask about the faller’s safety in the shower.

The CSRT OT did not make specific safety recommendations for the faller’s home, and did not suggest installation of a grab bar for the bathroom. According to a representative from the CSRT, “this [home safety assessment] is not a standard part of CSRT services. CSRT clinicians will address safety concerns as they arise during therapy sessions. Home safety is part of CCAC services. Typically, if home safety is a concern, a referral will have gone to the CCAC prior to our involvement. In this situation, no specific home safety concerns were identified”. The faller did not receive services from the CCAC because these services were deemed unnecessary by the health care team in the acute care hospital at the time of her discharge.

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draft
Swiss Cheese Report

Organizational Factors:
- Health care team in hospital decided that faller did not require personal support services or a home safety assessment from CCAC.
- Referral to community support services is decided on a case-by-case basis by hospital health care team, at discharge.
- Not all stroke patients discharged home receive both CCAC and CSRT support.
- It takes 36 days for CSRT to visit the faller after discharge from hospital.
- CSRT does not provide home safety assessments as part of their services.

Supervision:
- OT recommends to faller general, non-specific strategies to manage dizzy spells.
- Strategies to manage dizziness recommended by OT do not prevent loss of balance while performing activities of daily living.
- Husband is faller's sole caregiver.
- Faller's physicians do not reassess her medications after subarachnoid hemorrhage.

Preconditions:
- OT does not assess need for grab bar in the bathroom.
- Faller does not tell husband about dizziness.
- Faller does not want to worry husband.
- Faller does not tell OT about dizziness while showering.
- Faller experiences frequent dizzy spells, disorientation and headaches following stroke.
- Faller is on medications for high blood pressure, pain and anxiety disorder. All of which can cause light headedness, dizziness and fatigue.
- Faller suffered a subarachnoid hemorrhage.
- Faller is not using bath bench available in bath tub.
- Faller prefers to stand when washing her hair.
- Strategies to prevent dizziness require the faller to focus on a spot visually.
- Faller keeps her eyes closed while she is washing her hair.
- Faller has muscle weakness.
- Shower curtain is only thing there to break faller's fall.
- Shower curtain is loosely attached to the curtain rod.
- There were no grab bars installed in bath tub.

Unsafe Acts:
- Health care team in hospital discharges faller home with a referral to the Community Stroke Rehabilitation Team (CSRT). May 15, 2012
- Faller starts receiving occupational therapy from CSRT. Jun 20, 2012
- Faller frequently loses balance while showering. July, 2012
- Faller turns around to face front of shower. 11:06
- Faller suddenly feels dizzy. 11:06
- Faller loses balance. 11:06
- Faller grabs onto shower curtain to prevent fall. 11:06
Conclusions

The faller, a 55 year old woman, experienced a near fall while in the shower of her home on November 30, 2012 at 11:00. The faller suffered a subarachnoid hemorrhage (SAH) on April 22, 2012 and was admitted to the acute care hospital. She was discharged home on May 15, 2012 with a referral to the Community Stroke Rehabilitation Team (CSRT). The day of the near fall was completely normal for the faller. In fact, the near fall was a normal event for the faller, as she experienced a loss of balance 3-4 times a day. On the day of the near fall, the faller was washing her hair in the shower. While her eyes were closed, she turned around to face the front of the shower when she lost balance and pitched forward towards the shower curtain. She grabbed onto the shower curtain for support and held on until the dizziness passed and she had regained her balance. The faller had the expectation that she would continue to deal with her daily losses of balance in this way.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* Since experiencing the SAH and after her discharge from the acute care hospital, the faller experienced frequent dizzy spells and loss of balance. However, the faller did not communicate this to her husband because she did not want to worry him.

* At the time of the near fall, the faller was taking four prescription medications for high blood pressure, generalized anxiety disorder and pain. All four medications list dizziness, light headedness and fatigue as side-effects. The faller was taking these specific medications before she experienced SAH, but never experienced dizziness. The medications were not reassessed by the physicians caring for the faller for causing dizziness after she suffered SAH.

* The faller communicated her concerns over the frequent loss of balance and dizziness to the OT appointed by CSRT. The OT provided the faller with general strategies to prevent dizziness, such as visually focusing on one spot. However, these strategies were not effective and did not prevent faller from frequently losing her balance. In particular, these strategies were ineffective when she was in the shower and had to close her eyes to wash her hair. She also found that it was difficult to prevent turns of the head in the shower when she was confined to a small space and needed to turn her head to locate objects or wash herself. The faller was still struggling to cope but she accepted that the dizziness and frequent loss of balance are going to be a normal occurrence in her life.

* The only device that the faller received through OT therapy was a bath bench to use while showering. However, the faller preferred to stand while showering and only used the bench when shaving her legs. The CSRT OT did not conduct a home safety assessment, did not make specific safety recommendations for changes of home environment, and did not suggest a grab bar or shower mat.

* Although the OT was aware that the faller experienced dizziness, the faller did not share her specific difficulties while showering with the OT. The faller described her visual difficulties to the OT but this information did not translate into specific safety recommendations by the OT or any other team member from the CSRT. The CSRT team communicates and shares information regarding specific clients during a weekly meeting at the CSRT office.

* CSRT did not provide home safety assessments as part of their services. However, CSRT clinicians address safety concerns as they arise during therapy sessions. Home safety was part of CCAC services. Typically, if home safety was a concern, a referral would go to the CCAC at the time of discharge from hospital. In this situation, no specific home safety concerns were identified. The faller did not receive a referral to the CCAC upon the discharge the
acute care hospital, based on the judgment of her health care team.

* Because the faller did not receive a formal home safety assessment, her home was never adjusted to help her successfully and safely manage the consequences of her stroke. If unaddressed, this situation has the potential to escalate into a fall with serious injurious consequences.
Faller is admitted to emergency care following a subarachnoid hemorrhage.
April 22, 2012

She is admitted to the neurosurgery unit of acute care hospital and undergoes angiograms to test for cause of hemorrhage. April 22 - 30, 2012

Angiograms are negative for vascular abnormality.

Faller recovers in hospital. April 30 - May 15, 2012

Health care team in hospital discharges fallen home with a referral to the Community Stroke Rehabilitation Team (CSRT).
May 15, 2012

Faller visits neuro-ophthalmologist to deal with visual difficulties.
June, 2012

Faller finds that she feels dizzy when she turns her head from side to side.
June, 2012

Entire CSRT team (Speech language pathologist, RN, PT, OT and social worker) assigned to fallen visit fallen at the same time.
June 20, 2012

Health care team in hospital decided that fallen did not require personal support services or a home safety assessment from CCAC.

Referral to community support services is decided on a case-by-case basis by hospital health care team at discharge.

Not all stroke patients discharged home receive both CCAC and CSRT support.
Faller's physicians do not reassess her medications after subarachnoid hemorrhage.

Faller is discharged from CSRT, Aug 30, 2012

Faller frequently loses balance while showering.

Faller is progressing with therapies and copes with dizziness.

Faller wakes up. 10:00, Nov 30, 2012

She sits in living room and drinks coffee. 10:00 - 11:00

Faller takes medications.

She then goes to take shower. 11:00
Faller loses balance. 11:06

Faller suddenly feels dizzy. 11:06

Faller has muscle weakness.

Strategies to prevent dizziness require the faller to focus on a spot visually.

Faller keeps her eyes closed while she is washing her hair.

Faller prefers to stand when washing her hair.

Faller is not using bath bench available in bath tub.

Faller lurches forward towards shower curtain. 11:06

Faller grabs onto shower curtain to prevent fall. 11:06

Faller stands, leaning forward and holding onto curtain. 11:07-11:08

Dizzy spell passes and faller stands upright. 11:08

Shower curtain is only thing there to break faller's fall.

Shower curtain is loosely attached to the curtain rod.

There were no grab bars installed in bath tub.

Faller gets out of shower. 11:08

She washes her hair with her back to the shower head. 11:06

Faller turns around to face front of shower. 11:06
SFIM Investigative Report

Falling Down Basement Stairs
SFIM
Case ID: 9100812  Date: 2013-06-06  Subject #: 17917

Fall Information

2.1 Date of the fall: 2012-12-10
2.2 Day: Monday
2.3 Time of fall: 24-hour clock
   18:40
2.4 Witnesses:  Un-witnessed
2.5 Location of the fall:  Indoors
   Private Residence
   Basement
2.6 Activity at the time of the fall:
   Other
   Climbing stairs.
2.6a Was this person multi-tasking?  No
2.7 Action by the faller prior to loss of balance:
   Rushing
   Walking (task-oriented)
2.8 Type of fall:
   Transient loss of consciousness
2.9 Direction of the fall:
   Back
2.10 Environment at the fall location:

☑ Stairs

2.11 Mobility aid used at the time of the fall:

☑ None

2.12 Footwear worn by the faller at the time of the fall:

☑ Socks only

2.13 How did faller get up after the fall?

☐ Alone (self initiated)

2.14 Injury? ☐ Yes

2.15 Injury severity:

☐ Moderate - required medical attention (e.g. strain, extensive bruising, laceration, bleeding, burn, chipped tooth)

2.16 Injury type:

☑ Laceration/cut

2.17 Injury location:

☑ Lower back

2.18 Type of medical attention received:

☑ None
2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

- No
3.1. Demographics:

Year of birth: 1947 Age Calculated: 65
Gender: Male
Population (Check all that apply): Senior, Stroke survivor

3.2 Falls history:

Occasional faller (fell more than once in the past year)

3.3 To get an idea of the frequency with which this person falls, please answer the following questions:

a) Falls frequency

Number of falls in the last week: 2
Number of falls in the last month: 3
Number of falls in the last year: 5

b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):

Number of near falls in the past week: 10
Number of near falls in the past month: 30

3.4 Marital status:

Married

3.5 Mental status:

Normal, alert and oriented
Depressed

3.6 MMSE score:

Not available

3.7 Education:

Secondary school partial

3.8 Mobility aids:
Number of prescription medications used by the faller on the day of the fall

Medication Name:
Amitriptyline 10mg at bedtime

Medication Name:
Amlodipine Besylate 10mg daily

Medication Name:
Atorvastatin 20mg daily

Medication Name:
Docusate sodium 100mg 2x daily

Medication Name:
Indapamide Hemihydrate 1.25 mg

Medication Name:
Labetalol HCL 100mg every 12 h

Medication Name:
Pantoprazole EC 40 mg

Medication Name:
Paroxetine HCL 20 mg

Medication Name:
Spironolactone 100 mg

Medication Name:
Multivitamins daily
Medication Name:
Vitamin B12 250 mcg 2x daily

Vitamin D 1000IU daily

___ Number of over-the-counter medications used by the faller on the day of the fall
The faller was a 65-year-old man who suffered a subarachnoid hemorrhage, followed by a left thalamic infarct on Sept 18, 2012. He was admitted to the intensive care unit of an acute care hospital and spent three weeks there. He was then discharged to the Neurology Rehabilitation Unit of a rehabilitation hospital on Nov 2, 2012, where he recovered until discharge home on Dec 4, 2012. On the day of the fall, the faller and his wife spent a normal day at home. After dinner, the wife went out to run some quick errands. She knew that she would not be out of the house for more than 20 minutes. The faller had only been home for six days after discharge from the hospital, and usually the wife would leave him home alone only if she was going to be gone for a short period of time. On this day, after the wife left, the faller went down the stairs to the basement den area to watch TV. As soon as the faller got into the basement, he felt a sudden need to urinate. He immediately turned around to walk back up the stairs. The faller sometimes wore incontinence briefs, but, on the day of the fall, he was feeling confident and chose not to wear incontinence briefs while at home. Because of this, the faller was in a rush to get upstairs to the bathroom. As he was walking up the stairs, he “blacked out” on the third step. The faller fell backwards and scraped his back on a picture frame that was leaning against the side table at the bottom of the stairs. The faller wet himself. The faller then regained consciousness, got up on his own, and went upstairs and changed his clothes.

The Faller

The faller suffered from hypertension, Type 2 Diabetes, hyperlipidemia, depression, and possible osteoarthritis. The faller and his wife had both been married previously. The faller had two sons and many grandchildren. The faller’s sons were not involved in the caregiving for the faller after his stroke. The Community Care Access Centre (CCAC) Case Manager assigned to his case described the faller as impulsive, and explained that he had a tendency to get up and go, regardless of advice on falls prevention provided by the Case Manager. The OT stated that the faller “denied a serious risk of falling”. The faller had been provided with a walker and a cane from a local charity organization through his church, but was not keen to use mobility aids, especially while in his home.

Supervision and Care

The faller’s wife was his sole caregiver after his stroke. During the second meeting with the CCAC case manager, prior to discharge from the hospital, the wife expressed concern to the case manager over her ability to manage constant supervision of the faller, particularly when she had to go out to run errands. The case manager discussed potential strategies to manage the faller’s supervision. This included the wife taking the faller with her while running errands, having friends or family come over while wife would be out of the house, or having the faller go out to “have a coffee with a friend” while the wife is out. It was also suggested that the faller could sign up for a service through the rehabilitation hospital where he could press a button and summon help if he had a fall or another emergency. Having the faller accompany the wife while running errands was deemed unfeasible at the time; however the wife said that she did have friends and a supportive network from church on whom she could rely for support. Despite this, at the time of the fall, the faller had been left alone and although six days had passed since his hospital discharge, the wife had not yet asked any friends or family for help. The faller had stated that he was “not interested” in a CCAC Day Program (an Adult Day Program that provides supervision and care for a fee), so this option was not pursued further with the CCAC Case Manager. The faller initially did not want help from a Personal Support Worker (PSW), however following discussion with his wife he decided to try PSW care once a week for two months. The PSW was to help with more dangerous tasks such as transferring in and out of the bath tub and showering, and provide the wife a break from constant supervision.

Medications and Dizziness

The faller was taking a total of twelve prescription medications on the day of the fall. The 2 medications for
hypertension (Amlodipine Besylate and Indapamide Hemihydrate) both list “dizziness” as a potential side effect, especially when standing up quickly. The faller experienced frequent dizzy spells after his stroke, and he was struggling to learn to live with it. Two days prior to this fall, the faller had another fall after getting up from the couch too quickly, feeling dizzy, and falling back down onto the couch. While he was in the hospital, he was given tips to help safely manage his dizzy spells; however, these strategies did not produce desired results.

CCAC Care

The faller had been discharged from the rehabilitation hospital with a referral to the CCAC for transitional care. The in-hospital case manager met with the faller on Dec 3, 2012, and again on the day of his discharge (Dec 4, 2012). The Case Manager gave the faller a “high priority” ranking for follow-up with a home visit. The OT made her first visit four days later on Dec 8th. The PT made an initial visit on Dec 12th. The OT left a number of home safety recommendations after home assessment visit. These recommendations included: to visit a doctor if the faller has a fall and hits his head, to use a walker or cane for balance, and to keep walkways clear. The OT also recommended a shower chair and a vertical grab bar in the shower. The OT did not go down to the couple’s basement as part of her assessment. The OT was unaware of a need to install a handrail for the basement stairs or remove clutter at the bottom of the basement stairs. Although the CCAC does provide home safety assessments, these assessment protocols are not standardized and each OT uses assessment tools at their discretion.

Environment

The couple had multiple items and knickknacks on the floor and near tables and stairs. The basement area was especially cluttered. The couple also had five small dogs. The stairs leading down to the basement were very narrow and shallow, and the stairwell was poorly lit and unprotected on either side. The couple’s only working television was in the basement, so they spent a lot of time there. There was no bathroom in the basement. When the fall occurred, the faller sustained a very large abrasion on his back from landing on the corner of a picture frame that had been leaning against the side table, which was left at the bottom of the basement stairs. He did not seek medical attention. The faller did not use his walker indoors because it was too large to move around the house. He did not use his cane because it had a metal tip on the bottom that was slippery and unstable on the hardwood floors. The wife had the intention of replacing the tip of the cane with a rubber tip when she had the chance.

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Swiss Cheese Report

Organizational Factors:
- Even high priority clients, like the faller, have to wait several days for their initial home safety assessment.
- Wife has insufficient support from CCAC to manage supervision of faller after his discharge from the hospital.

Supervision:
- Faller is unattended while wife is running errands.
- Wife is sole caregiver for faller.
- Wife is not able to find supervision for faller when she goes out.
- Wife discussed informal caregiving options with CCAC, but did not contact any friends for help.

Preconditions:
- Faller is on 2 medications (Amlodipine Besylate and Indapamide Hemihydrate) that can cause dizziness when standing up quickly.
- Faller does not use his walker indoors as he finds it too big and cumbersome to maneuver in the house.
- OT makes no recommendations for handrail on stairs leading to basement.
- OT makes no recommendations about clutter in house.
- Faller has been at home for four days before home safety assessment.
- The family’s only working television is in the basement.
- There is no washroom in the basement.
- Faller is not wearing incontinence briefs.
- Faller is confident that he does not need to wear incontinence briefs while at home.
- Faller is in a rush.
- Faller is incontinent.
- The stairs to the basement do not have a railing.
- Basement stairs are extremely steep and narrow.
- Bottom of the basement stairs is cluttered with furniture and things.
- Faller has frequent dizzy spells.
- Faller is on 12 prescription medications, 2 of which have dizziness as a side effect.
- Faller has muscle weakness.
- Faller temporarily loses consciousness.
- Faller suffered a subarachnoid hemorrhage and left thalamic infarct 3 months ago.

Unsafe Acts:
- Faller falls after getting up from couch. Dec 6, 2012
- OT from CCAC visits home to make safety recommendations. Dec 8, 2012
- Faller’s wife goes out to run errands. 18:30
- Faller goes to basement to watch TV. 18:40
- At the bottom of the stairs, faller feels sudden urge to urinate. 18:41
- Faller quickly starts walking up the stairs to go to the washroom. 18:41
• Faller feels dizzy. 18:41
• Faller loses balance. 18:41
The faller was a 65-year-old man who suffered a subarachnoid hemorrhage, followed by a left thalamic infarct on Sept 18, 2012. He was admitted to the intensive care unit of an acute care hospital and spent three weeks there. He was discharged to the Neurology Rehabilitation Unit of a rehabilitation hospital on Nov 2, 2012, where he recovered until his discharge home on Dec 4, 2012. On the day of the fall, the faller and his wife had spent a normal day at home. After dinner, the wife went out to run some quick errands. She knew that she would not be out of the house for more than 20 minutes. The faller had only been home for six days after discharge from the hospital, and usually the wife would leave him home alone only if she was going to be gone for a short period of time. On this day, after the wife left, the faller went down the stairs to the basement den area to watch TV. As soon as the faller got into the basement, he felt a sudden need to urinate. He immediately turned around to walk back up the stairs. The faller sometimes wore incontinence briefs, but was not wearing them at this time. Because of this, the faller was in a rush to get upstairs to the bathroom. As he was walking up the stairs, he “blacked out” on the third step. The faller fell backwards and scraped his back on a picture frame that was leaning against the side table at the bottom of the stairs. The faller wet himself. The faller then regained consciousness, got up on his own, and went upstairs and changed his clothes.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified for this event and included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. These are discussed below:

* The faller was on 12 prescription medications, two of which are known to cause dizziness. Although he was given tips to help combat his dizzy spells while still in hospital, no long term solution was provided, and no follow-ups were arranged with the CCAC. The faller experienced frequent dizzy spells after his stroke, and this was a side effect that he did not know how to cope with. Two days prior to his fall, the faller had another fall after getting up from the couch too quickly, feeling dizzy, and falling back down onto the couch. Dizziness was not incorporated into a plan for falls prevention.

* The faller was incontinent, but did not wear incontinence briefs while at home because he felt he did not need them.

* The faller did not use prescribed walker or cane while inside his home. The walker was too large to move comfortably inside the house, and the cane had a metal tip on the bottom that made it unstable on the hardwood floors.

* Since the family’s only working television was in the basement, the faller often went down a very narrow and steep set of stairs to get to the basement. Rearranging the placement of the TV so that the faller would not be required to walk down the stairs and so that he would be closer to the washroom (located on the main level) was not discussed with the CCAC team.

* There was a great deal of clutter in the basement of the faller’s house, and the faller and his wife had five small dogs. The stairs to the basement were extremely narrow and dark, and were unprotected on either side.

* The faller was deemed as "high priority" by the CCAC but had to wait several days for an initial home safety assessment. In this case, the faller had been home for four days and had already had a previous fall (on Dec 6, 2012) before the OT visited to conduct a home safety assessment (on Dec 8, 2012).

* When the OT from the CCAC conducted the homesafety assessment, no specific recommendations were made for clutter in the faller’s house, or the need for a handrail on the stairs leading down to the basement. The OT did not go down into the faller’s basement to inspect it.
* The CCAC did not have a standard assessment protocol or form for home safety. Home safety assessments were done by OTs and were based on their personal experience and expertise.

* The faller’s wife was his sole caregiver after his stroke. The faller had two sons but they did not help with caregiving. During the second meeting with the CCAC case manager, prior to discharge from the hospital, the wife expressed concern to the case manager over her ability to manage constant supervision of the faller, particularly when she had to go out to run errands. The case manager discussed potential strategies to manage the faller’s supervision. The strategies suggested by the case manager did not seem feasible and were never pursued. The faller’s wife felt that she did not have enough support in caring for her husband and was not able to find supervision for her husband and did not feel comfortable leaving him home alone for longer than 30 minutes at a time. This greatly impacted her quality of life as she was unable to freely take care of herself and run her errands.
Faller recovers steadily.
Sep 18, 2012

He suffers a left thalamic infarct while in hospital.
Sep 19, 2012

The faller is discharged CCAC care.
Dec 4, 2012

Even high priority clients, like the faller, have to wait several days for their initial home safety assessment.

Faller is admitted to neurosurgery unit of acute care hospital.
Sep 18, 2012

Faller has first visit from CCAC Case Manager while still in hospital.
Dec 3, 2012

The faller is discharged home with a referral to CCAC care.
Dec 4, 2012

Faller falls after getting up from couch.
Dec 6, 2012

Faller does not use his walker indoors as he finds it too big and cumbersome to maneuver in the house.

Faller is on 2 medications (Amiodipine Besylate and Indapamide Hemihydrate) that can cause dizziness when standing up quickly.

OT from CCAC visits home to make safety recommendations.
Dec 6, 2012

OT makes no recommendations for handrail on stairs leading to basement.

Home safety assessment conducted by CCAC OTs is not standardized.

OT makes no recommendations about clutter in house.

Faller has been at home for four days before home safety assessment.

Even high priority clients, like the faller, have to wait several days for their initial home safety assessment.

Faller wakes up.
8:00, Dec 10, 2012

Faller has breakfast.
8:00 - 9:00

Faller spends time on computer.
9:00 - 12:00

Faller has lunch.
12:00 - 1:00

He takes a nap and rests in bed.
15:00 - 17:30

Faller eats dinner.
17:30 - 18:30
Faller's wife goes out to run errands. 18:30
- Faller is unattended while wife is running errands.
- Wife is sole caregiver for faller.
- Wife is not able to find supervision for faller when she goes out.
- Wife discussed informal caregiving options with CCAC, but did not contact any friends for help.
- Wife has insufficient support from CCAC to manage supervision of faller after his discharge from the hospital.

Faller goes to basement to watch TV. 18:40
- The family's only working television is in the basement.
- There is no washroom in the basement.

At the bottom of the stairs, faller feels sudden urge to urinate. 18:41
- Faller is not wearing incontinence briefs.
- Faller is confident that he does not need to wear incontinence briefs while at home.

Faller turns around to go back upstairs. 18:41
Faller quickly starts walking up the stairs to go to the washroom. 18:41

Faller is in a rush.

Faller is incontinent.

The stairs to the basement do not have a railing.

Basement stairs are extremely steep and narrow.

Bottom of the basement stairs is cluttered with furniture and things.

Faller falls backwards to his right. 18:41

He lands on his back on top of the clutter at the bottom of the stairs. 18:41

Faller changes his clothes. 18:43

Faller gets up by himself. 18:42

Faller feels dizzy. 18:41

Faller has frequent dizzy spells.

Faller is on 12 prescription medications, 2 of which have dizziness as a side effect.

Faller has muscle weakness.

Faller temporarily loses consciousness.

Faller suffered a subarachnoid hemorrhage and left thalamic infarct 3 months ago.

Faller loses balance. 18:41

Faller wets himself. 18:41

Faller scrapes his back on a picture frame. 18:41

Faller's wife returns home. 19:00

Wife tends to large abrasion on faller's back. 19:00

Faller does not seek medical attention for abrasion.
Curriculum Vitae

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Post-secondary Education and Degrees

The University of Western Ontario
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2005-2010 B.A. (Psychology)

Honours/Awards

University of Western Ontario Graduate Teaching Assistant Excellence Award-nominee 2012

Related Work Experience

Teaching Assistant
University of Western Ontario
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Research Study Coordinator
University of Western Ontario
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Clinical Research Coordinator
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Publications: