Quality of Care Transitions for Rehabilitation Patients with Musculoskeletal Disorders

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

ABSTRACT

Background: Care transitions are a common and frequently adverse aspect of health care, resulting in a high-risk period for both care quality and patient safety (Coleman, 2003; Forster et al., 2003; Picker Institute 1999; van Walraven et al., 2004; Cook et al., 2000). Patients who have complex care needs and undergo treatment from multiple care settings may be at a greater risk for poor care transitions (Coleman et al., 2004). Using quantitative performance measurement scales is one method that can assess the quality of care transitions, and identify areas for improvement. The psychometric properties of the primary performance measurement scale, the Care Transitions Measure (CTM), have not been rigorously assessed, particularly within a higher risk, medically complex population such as older adults with musculoskeletal (MSK) disorders. Furthermore, despite the negative health implications that can result from poor transitions and the commonality of care transitions among persons with complex care needs, there is a significant dearth of research on this crucial aspect of health care.

Methods: This research examines the ability of the CTM to adequately assess the quality of care transitions among a complex population of older MSK rehabilitation patients and explores care transitions from the perspective of the patient and the health care provider. Information was gathered through telephone administration of the CTM to MSK patients after they transitioned from inpatient rehabilitation units to home, and through a series of qualitative key informant interviews with a range of health care professionals in care settings relevant to the care continuum of older MSK patients. Inter-rater reliability, a type of reliability that has never been tested with the CTM, and construct validity were assessed and qualitative analyses were used to

examine qualitative information obtained through the CTM administration to patients and through the interviews with health care providers.

Results: The CTM demonstrated excellent inter-rater reliability for the overall score (intraclass correlation coefficient = 0.77; p=0.03) despite only fair agreement between each item. Internal consistency of the CTM was high (Cronbach's alpha = 0.94). The construct validity of the CTM was supported; however qualitative data from the patient and health care provider perspectives suggest additional items should be considered for inclusion. Qualitative information from patients also suggests the need for revisions to the wording of some items and the response options. Health care provider interviews suggest that issues surrounding transitional care are similar regardless of the care setting involved.

Conclusions: Although the CTM proved to be reliable, qualitative data suggests that the addition of items should be considered to improve the content validity of the CTM, which would in turn improve its construct validity as well. Recommendations for scale improvement are made, as are recommendations for an alternative scale to assess care transition quality from a health care provider perspective. The results of this study support efforts to improve the outcomes of care transitions, care planning, and the overall quality of life for older rehabilitation patients.

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DEDICATION

I would like to dedicate my thesis to my sounding board, my staunch supporter, and my inspiration. Mom, thank-you for always believing in me and supporting me every step of the way.

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OVERVIEW

The research conducted within this thesis aims to assess the validity of a performance measurement scale, the Care Transitions Measure (CTM), which assesses the quality of transitions from hospital to home. This measure was tested in a group of patients diagnosed with musculoskeletal (MSK) disorders transitioning from inpatient rehabilitation units at Freeport Health Centre in Kitchener to their home, where they have a more active role in their own care. MSK patients receiving inpatient rehabilitation are a complex patient population, requiring care from multiple health professionals across multiple health care settings, and as such, are at a greater risk for poor transitions (Coleman et al., 2004). In addition, various health care providers were interviewed to gain an understanding of the similarities and differences of the transition from inpatient rehabilitation to home versus other relevant transitions along the continuum of care for older patients diagnosed with MSK disorders. This research will add to the current body of literature on care transitions from the patient and health care provider perspectives, and will particularly contribute to further understanding of the psychometric properties of the CTM.

This thesis is organized such that the background literature relevant to the proposed topic area is presented first. Transitional care will be defined and pertinent literature surrounding the importance of care transitions research and implications and risk factors for poor transitions will be discussed. Next, MSK disorders and rehabilitation will be defined and discussed within the context of transitional care, as well as the significance of this clinical population and health care setting relating to the present study. Background literature examining the types of reliability and validity of outcome measures, with a focus on the necessity of multiple studies to adequately

ascertain a scale's psychometric properties, will also be detailed. This information will then be followed by a discussion of the CTM and its psychometric properties. This chapter will conclude with the overarching rationale and objectives of the current study.

This thesis is comprised of two main components: exploration of relevant issues surrounding care transitions from the perspective of the health care providers, and determination of the CTM's psychometric properties with older MSK rehabilitation patients. The second chapter examines transitional care from the perspective of various health care providers spanning the continuum of care relevant to older MSK patients, and presents the associated methodology, findings and interpretations, and discussion. The third chapter focuses on assessing the validity of the CTM. This section is comprised of both a quantitative and a qualitative component. A separate results section is presented for each component followed by a collective discussion to help facilitate a more comprehensive understanding of the findings. The thesis concludes with the fourth chapter that presents a discussion of the overall results from the research, including strengths and limitations, as well as suggestions for future research.

CHAPTER 1 BACKGROUND LITERATURE AND RATIONALE

1.1 CARE TRANSITIONS

The world is facing a period of changing demographics as seniors account for a greater proportion of the population due to significant increases in life expectancy and lower fertility rates within the general population (Kinsella & Velkoff, 2001). Canadians are not immune to this global change; the number of seniors is expected to increase significantly, from 4.6 million in 2005 to 9.8 million in 2036 (Statistics Canada, 2006). This aging cohort translates into an increasing number of adults with complex care needs who will subsequently require care provision from a variety of health settings, which may be disparate and fragmented. A consultant with the New York Centre to Advance Palliative Care remarked "translating that concept [the facilitation of care transitions] into reality has been difficult, in part because of the silo-driven way that health care is organized…There is discharge planning, but is there continuity of care?" (as cited in Meier & Beresford, 2008, p. 417).

The American Geriatrics Society Health Care Systems Committee (AGSHCSC) has proposed a definition of transitional care as being the actions carried out to ensure coordination and continuity of care for patients who are transferring to different care settings or care levels (Coleman & Boult, 2003). There is a multitude of care settings to which an individual may transition, forming multiple potential care trajectories. Different care settings include but are not limited to hospitals, patients' homes (with or without home care), long-term care homes, and sub acute or post acute facilities (Coleman & Boult, 2003).

Despite the goal of care continuity between care levels and settings expressed in the definition of transitions, in reality, transitions from one care setting to the next are plagued with

discontinuity and a lack of coordination. The responsibility of care shifts from the hospitalist to the primary care physician and the patient (Manian, 1999), and often the necessary medical information, generally in the form of a patient discharge summary, is inadequate or incomplete (Kripalani et al., 2007). Furthermore, the acute health care system is designed to discharge patients quickly; fast transitions can lead to poor discharge planning, care co-ordination, and post-discharge intervention (McWilliam & Sangster, 1994). Contrastingly, some patients are staying in acute care settings for longer than is appropriate; these slow transitions are often due to an inadequate exchange of information and poor communication among health care providers, patients, caregivers, administrators, and other pertinent stakeholders (Change Foundation, 2008). A recent Canadian study found that the process of transitioning from the hospital to LTC took 160 steps, primarily consisting of handling steps and forms (Change Foundation, 2008). These systemic problems often serve to exacerbate an already difficult time for the patient and caregiver and demonstrate the importance of identifying ways to improve care transitions.

Care transitions are a very common event. For instance, the Canadian Institute for Health Information (CIHI, 2009) specifically examined long term care patients 75 years of age or older who were transitioning to acute care within a hospital. They found that these patients accounted for 35% of acute care hospitalizations and that approximately 25% of these patients had experienced two or more transitions that year.

Continuity of care during transitions has been recently recognized as a health systems priority, as exemplified by a recent report released by the international Organisation for Economic Co-operation and Development (OECD) that examined ways to improve health care systems through enhancing the co-ordination of care (Hofmarcher, Oxley & Rusticelli, 2007). In

addition, the Institute of Medicine (2006) named transitional care as one of three priorities for performance measurement. Both organizations acknowledged the dearth of research examining this pertinent aspect of health care. In Ontario, transitional care has been recognized as a provincial policy priority. The Ontario Home at Last (HAL) programs, initiated in 2007, have been designed to facilitate smooth transitions from hospital to home for at-risk patients. These programs fall under two main categories as delineated in the Provincial HAL Task Group's (2009) evaluation framework. The first category is Discharge Support and Care Co-ordination which provides services such as conducting safety assessments and linking patients with community support services. The second category is the Provision of Direct Care Services, which encompasses the direct care provided by community support services and/or Community Care Access Centres. Although HAL programs or their equivalent have been implemented throughout Ontario, programs vary in terms of intensity, proposed objectives, and types of support provided (Provincial Home at Last Task Group, 2009). Having a valid performance measurement scale that assesses care transition quality would help support the ongoing evaluation and improvement of these initiatives.

Transitions from one care setting to another are likely to mirror changes in the patient's functional status, ability for self care, and health (Mor, Wilcox, Rakowski, & Hiris, 1994; Covinsky, Palmer, & Fortinsky, 2003). These care transitions often accompany a new diagnosis or a change in medication regimen (Coleman & Fox, 2004); however, the transition itself also introduces risk for the patient both in terms of patient safety and care quality. A poor transition can lead to medication errors (Moore, Wisnivesky, Williams, & McGinn, 2003), a return to a higher-intensity health care setting (Coleman et al., 2004), an increased use of hospital, ambulatory and emergency services (Coleman, 2003; Forster et al., 2003; Weissman et al.,

1999), and a subsequent increase in the cost incurred by the health care system (Coleman & Fox, 2004). Among older patients discharged from the hospital, almost a quarter experience a negative health outcome, such as hospital readmission, within 30 days (Murtaugh & Litke, 2002).

Recent research has shown that information transfer and communication between and with health care providers across the continuum of care are substantial health system issues (Naylor 2002; Spragins et al., 2008; Schoen et al., 2007) and that the inadequate exchange of information among various stakeholders is a major risk factor for poor care transitions (Naylor et al., 2005; Coleman & Fox, 2004; Weaver et al., 1998; von Eigan et al., 1999). For instance, a deficit in information and training for seniors and their caregivers upon discharge from hospital to home has been identified (Graham, Ivey, & Neuhauser, 2009). Correspondingly, patients, caregivers, and home care practitioners feel that education regarding medications, treatment protocols and diet is insufficient (McWilliam & Sangster, 1994). Patients, as well as their caregivers, often feel unprepared and have insufficient information for their more active role in the health care setting they are transitioning to (von Eigen et al., 1999; Weaver et al., 1998), and are often unable to contact the appropriate practitioner when guidance is required (Coleman et al., 2006). Furthermore, some caregivers provide personal care or care at a nursing level, and many report that information for the provision of care was gathered from friends, family or personal experience rather than health care professionals (Graham et al., 2009). The lack of preparedness, education, and exchange of information for patients and caregivers is especially disconcerting as oftentimes they are the only source of continuity throughout the care transitions (Coleman, 2003). Furthermore, patients and caregivers often do not have the skills and are not

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confident for this role as the facilitator of care transitions (Coleman, 2003). The importance of these two groups being actively involved within the transition process has been recognized by the AGSHCSC as a fundamental aspect of improving transitional care for older individuals (Coleman & Boult, 2003). The above literature also demonstrates that the need for accurate and timely information from health care providers to patients and caregivers becomes even more crucial when the patient is transitioning home, as the transition home involves the patient and/or caregiver taking on a much more active role in terms of disease self-management and medication use (von Eigen et al., 1999; Weaver et al., 1998; Moore, 2003). In a recent qualitative study, one participant who had recently experienced a hip fracture reflected on the harsh reality of this transition, "No matter how much you prepare, I don't think anyone prepares you for the horrible reality of home" (Tardif & Baker, 2009, p. 17).

The current literature on transitional care highlights that despite the increasing recognition of the risks associated with poorly executed transitions, this important aspect of care is still in its infancy with respect to research, policy implementation, and clinical practice. The proposed project will contribute substantially to the literature as it will assess the validity of a performance measurement scale for use in assessing the quality of care transitions within a complex patient population transitioning to the very significant care setting, home. Exploring transitional care from both the patient and health care provider perspective will facilitate a more comprehensive understanding of the capacity of this performance measurement scale as well as factors that support successful care transitions.

1.2. MUSCULOSKELETAL DISORDERS: OVERVIEW, REHABILITATION, AND CARE TRANSITIONS

Musculoskeletal disorders (MSK) are the primary "cause of chronic pain and physical disability" in the general population (Brooks, 2006). The term MSK disorders refers to a large constellation of conditions; MSK disorders can affect the bones (e.g., fractures), the joints (e.g., arthritis), the muscles or extra-articular soft tissues (e.g., fibromyalgia), or the periarticular tissue (e.g., bursitis; Merck Manuals, 2009). MSK disorders afflict more than four million Canadians, incurring an economic burden of over $16 billion on the Canadian health care system (Public Health Agency of Canada, 1998). The frequency of MSK disorders increases exponentially with age; in those under the age of 60, the prevalence of locomotor disorders is 3.1%, whereas among those aged 75 or older the prevalence of these disorders rises to almost 50% (Martin, Meltzer, & Elliot, 1988). These figures are likely to increase considering the changing demographics of our society. MSK disorders can result in a cascade of adverse events, subsequently requiring care from multiple care settings, including rehabilitation.

The World Health Organization (WHO; 1981) denotes that the primary goal of rehabilitation is to provide training to maximize an individual's ability to adapt to his/her environment and re-integrate with society, and to minimize the impact of the disease or impairment. Although rehabilitation is accepted as a successful form of treatment for younger patients, among older more complex patients, research examining the role of rehabilitation in functional improvement has produced conflicting results (Bachmann et al., 2010). Some form of rehabilitation is commonly utilized with MSK patients post operation to enable them to regain their pre-morbid functional ability, yet, for instance among hip fracture patients, only 25 to 50% actually accomplish this (Hall, Williams, Senior, Goldswain, & Criddle, 2000; Marotolli, Berkman, & Cooney, 1992). The role of inpatient rehabilitation as compared to other forms of

rehabilitation has also produced contradicting results. Studies examining early discharge from acute care plus rehabilitation at home versus inpatient rehabilitation among a sample of hip fracture patients found no functional differences between these two groups one year after discharge. These findings indicate that early discharge in conjunction with home-based rehabilitation is comparable in terms of functional outcomes when compared to inpatient rehabilitation (Crotty et al., 2002; Crotty et al., 2003). Potentially, home-based rehabilitation helped establish patient and caregiver responsibility in the home, providing the opportunity to gain confidence in the home environment and preparing them for their more active role in their care provision. On the other hand, a positive relationship has been found between decreasing lengths of stay in inpatient rehabilitation hospitals and mortality among patients with orthopedic conditions, suggesting that longer inpatient rehabilitation is beneficial for patients (Ottenbacher et al., 2004). Furthermore, a recent systematic review assessing the impact of inpatient rehabilitation specifically designed for geriatric patients found that these programs can improve functional outcomes, nursing home placement, and mortality (Bachmann et al., 2010), indicating that tailoring inpatient rehabilitation to the needs of older adults produces positive outcomes.

Older patients diagnosed with MSK disorders often have complex care needs. As such, they may undergo treatment in multiple care settings and are at a greater risk for poor care transitions (Coleman et al., 2004). A primary risk factor for poor transitions, inadequate knowledge sharing between patients and practitioners, has been found to be a common experience for older MSK patients and likely affects their outcomes following rehabilitation (Olsson et al., 2007). Furthermore, poor care co-ordination has been found to be correlated to poor functional outcomes among MSK patients. For instance, in a population of patients who had

a unilateral knee replacement, poor care-co-ordination was related to greater joint pain and lower functional status six weeks post-surgery (Weinberg et al., 2007). Research examining care transitions has tended to focus on the discharge from acute care (Tardif & Baker, 2009); however the transition from hospital to home is often mediated by treatment in rehabilitation or complex continuing care units, particularly for older more complex patients that are at a greater risk of poor transitions. Therefore the transition from inpatient rehabilitation to home is highly relevant and in need of further research.

MSK disorders are highly prevalent, particularly among older adults. Older MSK patients requiring some form of inpatient rehabilitation are an especially complex group of patients, requiring care from multiple practitioners across multiple care settings. The complexity surrounding both the patient and the co-ordination of care they receive makes this clinical population and care setting highly relevant for evaluating the quality of their care transitions. A performance measurement scale assessing transitional care quality has not yet been validated within this specified population or for the transition from inpatient rehabilitation to home. The necessity of validating scales within the population in which they will be used is discussed in the following section.

1.3. PSYCHOMETRIC PROPERTIES OF OUTCOME MEASURES

Assessing health outcomes is important for the continual evaluation and improvement of the current health care system. It is crucial to appraise the psychometric properties of a health outcomes measure in order to draw accurate conclusions about a construct and to develop and evaluate subsequent interventions. Assessing a scale's psychometric properties is particularly important when the measure is new, or when the study sample differs from the sample the scale

was originally validated in. The following section outlines important concepts relating to the validation of a measure.

1.3.1. Reliability

The reliability of an instrument indicates its consistency and is inextricably linked to the population it is going to be used in; reliability is a relative measure (Streiner & Norman, 2003). This is because any reliability formula always includes the total variability of scores in the denominator, as indicated by the formulaic definition of reliability, *Reliability = Subject Variability/ [Subject Variability + Measurement Error]* (Streiner & Norman, 2003). This translates into relatively higher reliability in more heterogeneous samples or samples with high subject variability and relatively lower reliability in more homogeneous samples or samples with low subject variability. Therefore, it is important to re-assess the reliability of an instrument if the target population differs from the population in which it was originally tested. There are three primary types of reliability generally assessed: internal consistency, test-retest, and inter-rater. Internal consistency, generally expressed as Cronbach's alpha, determines how well the various items in the scale correlate together. However, this indicator of reliability is a very crude measure and does not incorporate many sources of variance into its calculation. Test-retest reliability assesses the stability of the instrument over time; the test or measure is administered twice to the same individual with a certain period of time between the two administrations, generally 2 to 14 days. If the measure has good test-retest reliability, then the participant's scores for each administration should be the same, assuming that the underlying characteristic or construct the tool is measuring has not changed during this period. Inter-rater or inter-observer reliability assesses the agreement between different raters. In addition to accounting for differences between raters, inter-rater reliability also captures the same sources of error as test-

retest. Therefore, inter-rater reliability is a more conservative estimate of reliability, and if a scale has high inter-rater reliability, then it can generally be assumed to have high test-retest reliability as well (Streiner & Norman, 2003).

1.3.2. Validity

Validity determines whether the instrument is measuring what it purports to measure. There are three measures of validity primarily assessed: content, criterion, and construct. Content validity evaluates whether the scale encompasses all pertinent content for the particular construct being measured. A related indicator of validity, face validity, is used to determine whether the instrument appears to measure the construct under study. Criterion validity assesses the degree of correlation between the instrument and a gold standard measure of the construct being studied if the measures are continuous. If the outcome is dichotomous, for instance a diagnosis, then specificity and sensitivity are used to determine criterion validity. Construct validity indicates how well a scale is measuring the theoretical construct. There are two primary subsets of construct validity: convergent and divergent. Convergent validity assesses the degree to which constructs that should theoretically be related to each other are in reality related each other, whereas divergent validity measures the degree to which constructs that should not be theoretically related to each other are not in reality related to each otherConstruct validity is an ongoing process, and cannot be determined by a single study. Therefore, multiple studies are required to develop an adequate understanding of the construct as well as determine the construct validity of the measure (Streiner & Norman, 2003).

1.4. CARE TRANSITIONS MEASURE

Using quantitative performance measurement scales is one method available to assess the quality of care transitions and to provide information that can lead to improvements within the health system. Despite the commonality of transitions there is a dearth of research examining this pertinent aspect of health care. The lack of research may in part be due to the methodological difficulties intrinsic within care transitions research. Since older adults are often more medically complex and are therefore at a greater risk of poor transitions, care transitions research has tended to focus on this population. This introduces research challenges related to the complexity of the patient population; participants may be difficult to recruit due to their fluctuating health status, frailty, pain levels and therapy schedules (Quinn et al., 2008). Furthermore, developing valid and reliable measures is complicated by the frailty, heterogeneity and comorbidity within older populations.

The most prominent measure used to assess the quality of transitions is the Care Transitions Measure (CTM; Coleman et al., 2005). Please refer to Appendix A for a copy of the CTM and accompanying scoring instructions. The CTM is a self-report, unidimensional measure comprised of 15 items. The CTM was developed based on 4 domains identified through qualitative analysis of focus groups: 1) Information Transfer; 2) Patient and Caregiver Preparation; 3) Self-Managament Support; and 4) Empowerment to Assert Preferences (Coleman et al., 2002). Items were drafted based on these domains. Subsequent confirmatory factor analysis revealed that the scale had 4 subdimensions that varied slightly from the initial domains identified: 1) Critical Understanding; 2) Importance of Preferences; 3) Management Preparation; and 4) Existence of Written and Understandable Care Plan (Parry et al., 2008). All responses are arranged on a 4-point Likert scale, ranging from strongly disagree to strongly agree,

corresponding to scores of 1 to 4, respectively. An additional response option for each item, "Don't Know/Don't Remember/Not Applicable" is also listed, however, results from this response option are not included in the final score. Scores from each item are aggregated and converted to a scale ranging from 0-100 through a linear transformation. Higher scores are indicative of a better transition.

The psychometric properties of the CTM were assessed in a sample (*n*=200) comprised of patients over the age of 18 (*M*=67.2) with a primary diagnosis of chronic obstructive pulmonary disease, congestive heart failure, stroke, hip fracture or other. Participants were discharged from hospital 6 to 12 weeks before study participation (Coleman et al., 2005). A more complete list of sample characteristics is available on page 29. The CTM has been found to have excellent internal consistency (Cronbach's alpha = 0.93). The CTM's construct validity has also been assessed; this measure was shown to be effective in differentiating between patients who were discharged from hospital and experienced a re-admission versus those who did not, as well as differentiating between health care facilities that adhere to different care coordination levels (Coleman et al., 2005). Construct validity was also established by correlating the CTM items with selected items from both the Consumer Assessment of Health Plan Study (CAHPS) Survey (Version 2.0) that assesses the experiences of adult inpatients and a hospital satisfaction survey for patients (Hendriks et al., 2001), resulting in a correlation ranging from 0.38-0.60 and 0.39-0.59, respectively. Face validity was determined by patients and clinicians assessing the measure's clarity, relevance, and comprehensiveness (Coleman et al., 2002). No significant floor or ceiling effects were found (Coleman et al., 2002). There are no data regarding inter-rater or test-retest reliability of this measure.

A three item version of the CTM was also created to decrease the burden on the patients, and is derived from items 2, 9, and 13 from the 15 item measure. This version was found to account for 88% of the variance of the 15 item CTM. This measure was subsequently endorsed by the National Quality Forum (Reddy & Sabatino, 2007). More than 1000 groups spanning over 15 countries have requested to use the CTM as a measure for the quality of transitional care, with the WHO Regional Office for Europe using the CTM in close to 200 hospitals in 10 countries (Coleman et al., 2007). Yet despite its widespread use, there is a lack of research examining CTM's psychometric properties. To date, the CTM has been validated in relatively heterogeneous samples of varying age and primary diagnosis (Coleman et al., 2005) and very few studies have been conducted to determine the construct validity of the measure. Additional research is required specifically regarding the performance of the tool among older populations of rehabilitation patients.

1.5 RATIONALE AND STUDY OBJECTIVES

The CTM has been shown to be promising in the evaluation of health system performance, particularly regarding the transition from hospital to home. The current study aims to assess the CTM's ability to adequately measure the quality of care transitions among a complex patient population, older patients with MSK disorders transitioning from inpatient rehabilitation units to home. The patient population under study is especially relevant for transitional care research, as older MSK patients requiring inpatient rehabilitation are medically complex and receive care from multiple care providers across multiple care settings, placing them at an increased risk of poor care transitions. This study is unique in that, to date, there is no research examining transitions from inpatient rehabilitation units. Furthermore, there is no literature surrounding the test-retest or inter-rater reliability of the CTM, and very few studies

have been conducted to establish the construct validity of the CTM. Therefore, both the reliability and validity of this instrument will be assessed in order to appraise the utility of this tool and identify areas where future research is needed. Furthermore the studies will employ both quantitative and qualitative research methods to help ensure that the complexity of this common and frequently adverse aspect of health care is adequately captured, and that the acceptability and feasibility of the CTM is assessed.

In addition, pertinent issues surrounding transitions will be examined from the perspective of health care providers working in health settings relevant to the continuum of care for older MSK patients. Since the CTM assesses transitions from a hospital setting, the focus of this component of the research was to examine issues surrounding the transition process from two hospital settings, acute care and inpatient rehabilitation units. Results from this component will not only serve to identify similarities and differences across relevant transitions, but will also provide detailed evidence regarding the transition examined by the CTM from the patient perspective, the transition from inpatient rehabilitation to home. Comparison of these health care provider interviews with the quantitative and qualitative data obtained from the administration of the CTM will also offer the possibility of the triangulation of results, providing a more comprehensive view of care transitions for older patients with MSK disorders. The current study will therefore provide a significant and unique contribution to the literature, and may support efforts to improve the outcomes of care transitions, care planning, and the overall quality of life for older rehabilitation patients.

This research was guided by one primary research objective, achieved through three sub-objectives.

Objective. Advance understanding of the assessment of transition quality for older MSK

patients through:

> *a)* examining issues relevant to MSK patients transitioning from inpatient rehabilitation
>
> to home from the perspective of various health care providers, and compare and
>
> contrast this transition with other transitions across the continuum of care for older
>
> MSK patients.
>
> *b)* testing the psychometric properties of the CTM among a population of older persons
>
> with MSK disorders transitioning from inpatient rehabilitation to home;
>
> *c)* exploring issues relating to the measurement of care transitions, and care transitions
>
> themselves from the perspective of older MSK patients; and,

In order to meet the first sub-objective, interviews with various health care providers

across the care continuum were conducted (detailed in Chapter 2). The final sub-objectives were

met through administering the CTM to older MSK patients post-discharge from inpatient

rehabilitation or complex continuing care units (detailed in Chapter 3). Together, these two

components of the present study underscore pertinent transitional care issues for older MSK

patients and help determine whether the CTM can adequately capture the quality of care

transitions for this complex patient population.

CHAPTER 2. HEALTH CARE PROVIDER INTERVIEWS

The following section details the methodology, findings and interpretations, and discussion of the research carried out in an effort to understand salient issues surrounding care transitions from the perspective of the health care providers. This component of the study also provides further detail regarding the transition examined in Chapter 3 by the CTM, the discharge process from inpatient rehabilitation to home.

2.1. METHODS

2.1.1. DATA COLLECTION

A total of 13 in-depth qualitative interviews lasting an average of 24 minutes were conducted with a range of health care professionals (*n*=17) in various care settings relevant to the continuum of care for older MSK patients. All interviews were carried out in private rooms within the specified health care settings, including Grand River Hospital's Acute Care unit, Freeport Health Centre's Inpatient Rehabilitation Unit and Complex Continuing Care unit, Winston Park's Retirement Home and Long Term Care (LTC) home, and Kitchener-Waterloo's Community Care Access Centre (CCAC). Within Acute Care, the director and clinical manager were interviewed as well as two resource nurses and one CCAC case manager. At Freeport Health Centre, one clinical manager, one physiotherapist, one occupational therapist, one resource nurse, one nurse practitioner, and one CCAC case manager were interviewed. In Winston Park, the retirement home director and the LTC director were interviewed as well as a resource nurse and a kinesiologist. In addition to the two CCAC case managers interviewed within the two hospital settings, the senior director of CCAC client services was also interviewed. They were recruited using a snowball sampling technique, where identified key

informants, namely managers in each care setting, were asked to identify other informants knowledgeable about the exchange of information, particularly surrounding admission and discharge (Rossi et al., 2004). Interviews were semi-structured and comprised of broad, open-ended questions that primarily addressed the health care provider's role surrounding the admission and/or discharge process, specifically probing for detail surrounding the exchange of information between health care providers and among health care providers, patients and caregivers or family members. Please refer to Appendix J for a copy of the interview guide.

2.1.2. DATA ANALYSIS

Digital recordings were transcribed verbatim. Throughout the analysis, notes were kept regarding insights gained during the analyses and other relevant information. The analysis of the interviews was guided by the analysis framework developed by Graneheim and Lundman (2004). Initially, transcripts were read carefully three times to achieve a thorough understanding. Significant statements were then identified. Based on these statements, codes were formulated to capture meaning units, then were grouped together. These groupings led to the creation of themes, which described the phenomena under study. In an effort to strengthen the quality of the analysis and prevent bias, collaborative and iterative meetings with other colleagues were held throughout the analysis process (Graneheim & Lundam, 2004). Subsequently, I further reviewed the interview transcripts to verify the findings.

2.2. FINDINGS AND INTERPRETATIONS

Although many overarching themes identified cut across all health care settings examined, some subthemes were only pertinent in a single care setting. This factor will be addressed as necessary. These themes will also be examined in the discussion within the context

of pertinent transitional care and continuity of care literature. There were five themes identified that will be discussed in detail below: patient complexity primary determinant of care trajectory; multiple people involved in transition process can be both beneficial and challenging; despite some challenges, health care providers within care settings using linked electronic records are generally more satisfied with information transfer; effective information transfer both within and between care settings is necessary to facilitate smooth transitions; and, information sharing with the patient and their family largely falls on longer stay hospital settings. In addition to these themes, it was found that all care settings made use of both standardized and non-standardized forms to convey information, as well as formal and informal modes of communication both within and between care settings. It was frequently mentioned that the fast-paced environment and the complexity of older MSK patients necessitates the use of these varying modes and forms of information transfer. Furthermore, it was found that overall each care setting was interested in receiving the same core set of information from the previous care setting: admission application/profile, Medication Administration Records (MARS), and any pertinent rehabilitation or post-operative instructions.

Patient complexity primary determinant of care trajectory

In each care setting examined, the complexity of the patient was a major determinant influencing their care trajectory. Most commonly, the patient's advanced age, frailty level, previous care setting, multiple comorbidities, and cognitive impairment were cited as primary attributes characterizing older MSK patients and were also factors leading to more challenging care. The presence of some form of cognitive impairment was found to be the most pivotal patient characteristic influencing care. A health care provider at Freeport noted:

> "And with maybe a quarter of them there are some cognitive impairment that really, really limit what you can do. It's the whole learning and carrying over information that is not there and that is a huge issue." [FP13]

Furthermore, these complex patients are transitioning out of acute care quickly; patients transitioning from acute care to long term care are in hospital an average of 3 days and patients transitioning from acute care to Freeport or home are in acute care for an average of 7 to 10 days. These fast discharges with such complex patients lead some health care providers to question their medical stability:

> "The thing is, the patients when they come here are supposed to be medically stable so that we can focus on their function. Well, are patients really that medically, you know when you have a lot of chronic disease, it doesn't take much to tip you. And I can't send people back to acute care every time they go in heart failure because now I'm pushing them and maybe they have some respiratory disease, and I'm pushing them to walk 6 meters and now they're short of breath or their blood sugars are a little off because they haven't been eating properly." [FP21]

Patients' medical complexity was also found to impact the speed at which they recovered, which was discussed within the context of an incompatible health care system that strives to discharge patients quickly:

> "But if you're 85 and you have all these other problems, plus then you break your hip, you're not going to recover in 6 weeks, it's just not, it's not a realistic time frame and you're really not going to recover in the 10 days the hospital gives you to recover. It's just not possible." [FP22]

An almost step-wise relationship was found between the range of patient complexity each care setting experienced: acute care saw the greatest *range* of patients (ranging from healthy MSK patients who could transition home from acute care to highly complex patients who transitioned straight to LTC), followed by Freeport, followed by home, retirement home and LTC. Within

Freeport, patients in Complex Continuing Care are generally more complex and more likely to

require a greater amount of support upon discharge compared to patients within General

Rehabilitation. However, any patients who require some degree of in-hospital rehabilitation

following acute hospitalization for a MSK disorder are necessarily complex patients:

> "I would say that if they come to this setting there's likely, it's been a complicated
> situation...People who come here tend to have co-morbidities such as arthritis
> that's affecting their overall movement and their healing or you know an older
> person may have more trouble healing. So I would say on average the people
> who come here are not as straight forward. There are usually other things going
> on...Otherwise they'll go home from the acute site with home care and what not."
> [FP14]

In both acute care and Freeport, these complex patients' health is often fluctuating, resulting in

an ever changing discharge plan. An acute care provider remarked, "It kind of works out that,

nobody is for sure going anywhere" [AC5].

Multiple people involved in the transition process can be both beneficial and challenging

In both Grand River Hospital and Freeport Health Centre, a multidisciplinary team

approach, comprised of CCAC case managers, nurses, physiotherapists, occupational therapists

and physicians is used for treating the patient as well as deciding a patient's discharge date and

location. Although the goal of using a team approach toward care is to facilitate a more

comprehensive view of the patient and therefore a more beneficial care plan, these two hospital

settings differ with respect to their ability to achieve this goal.

In acute care, one of the primary challenges addressed by each key informant interviewed

were the issues surrounding inconsistent staff within the care team. Both physiotherapists and

nursing staff are on shift work, and there is not always one physiotherapist on the floor at any

given time. This can negatively impact discharge planning and patient care:

> "That is a difficulty in planning because today the physio I was working with
> yesterday for discharge planning is not there so now I have to wait for that other
> physiotherapist to get on board...it hinders the flow of discharge for sure...especially
> for a fracture or orthopedic perspective because they're very important in getting
> them ready to where they have to go." [AC5]

From the perspective of the health care providers at Freeport Health Centre, this issue did not

arise in either of the units. Although the nurses at Freeport are on shift work, the physiotherapists

are consistent and always on the unit. Furthermore, Freeport's resource nurse approaches the

shift nurses each morning in order to gather information about each of the patients to update the

rest of the team. Overall, all health care providers at Freeport discussed the benefits of team work

and valued each other's expertise:

> "I mean the therapists of course have the most pull when it comes to function. The
> doctor of course from the medically stable or not point of view, the nurses of course
> their opinion is vital as far as can the person get themselves washed and dressed and
> out of bed in the morning, transfers, that kind of thing. But it's kind of more of a
> team. It really is. [We] work really well as a team so when we have those team
> meetings, we as a team come to a conclusion before we even go to the family
> meeting. So we all know what each other is thinking and we're always on the same
> page." [FP22]

This quote also demonstrates the harmonious nature of the care team within Freeport. In

acute care, it was apparent that different members of the team had varying goals leading to

potential conflicts. For instance, the CCAC case managers in both Freeport and Grand River

Hospital have a role in both facilitating home care and discharge planning. At Grand River

Hospital, pressures for acute care beds lead to fast discharges, creating difficulties for

discharge planning and opposing views:

> "We do have challenges sometimes with CCACs only because we are in acute
> care and we just want to move people through here and they are transitioning
> people into the community and the speed is a little different sometimes it does not
> match ours and what we think it should be." [AC2]

In addition to the multidisciplinary team being involved in patient care, family members have an

integral role in deciding where patients will transition to and the level of support required. The

importance of family members being involved was addressed in all care settings, both because

they can often give an accurate account of the patient's social or medical history and because

they can provide social and instrumental support once the patient has been discharged.

Furthermore, in Freeport specifically, it was discussed how the patient and their family

have the ultimate decision regarding where and how their needs would be met after they leave

the hospital, even if their decision conflicts with that recommended by their health care team.

> "At the end of the day as long as a client is competent they can choose where to
> go. They can choose to go home against anybody's advice. Right, so we may
> recommend that they go to a retirement home to at least convalesce while they are
> healing and you know they may say I don't have the money, I don't want to, I
> want to go home and you know at that point you know we've educated their risk
> of falls and what could happen if they choose to go home. We have to try to
> make that work for them right, so we get CCAC involved and we try to give them
> as much education as we can to facilitate them going home as safe as possible
> even though it is not the safest option." [FP14]

Likely, allowing the patient to assert their preferences regarding their care is much more

relevant in rehabilitation settings than in acute care settings, as the patient would be more

medically stable and thus more able make a competent decision.

Despite some challenges, health care providers within care settings using linked electronic records are generally more satisfied with information transfer

One of the primary facilitators of information exchange between care settings discussed by the large majority of health care providers interviewed was the use of linked electronic data systems. Grand River Hospital and Freeport Health Centre have linked electronic information systems, as do all CCAC case managers spanning the hospitals and the community. Health care professionals with linked information systems were in general much more positive about the information they are able to gather from the previous care setting:

> "The case managers that I work with over at the acute site, we have a charting system that they chart what they do and I can pull it up. So I know exactly what they've done and I just add to it. And same with the community case managers... It's all the same system...So I mean I can look up how they were doing at home and who was supporting them at home and maybe some problems that they're not disclosing that may have been happening at home, then I can at least go to them and say 'you know I've heard this was happening how can we help with that'." [FP22]

By contrast, LTC staff who do not have access to electronic hospital records were very unhappy about the amount of information they received:

> "There is sometimes a lot of information that's missing, sometimes we don't even get a verbal report from the nurse so all of a sudden the patient just shows up and we're like, ok we had no idea that they were coming." [LTC2]

There are also some challenges associated with the use of electronic data systems. While health care providers from the sending care setting may assume that all of the required information can be obtained through looking at the electronic documentation, some information can be difficult to find, and sometimes the speed of information transfer through electronic means is not rapid

enough to keep up with the ever changing discharge plans, necessitating the use of informal

modes of communication:

> "Because often when they send a referral over they send it over very skimpy
> thinking that we can pick up all our information off the computer. Sometimes we
> can't, sometimes we can." [FP15]

> "Usually, 9 times out of 10 the information is there but it's not easy to find it
> always. It's not as obvious, it's not written necessarily where I would write it and
> the sheet that we get, the initial sheet has some tables and lines where things
> should be written but they're not always there." [FP13]

> "So sometimes we get it electronic but because things change so quickly we may
> choose to talk directly so we know what plan we're working with." [AC4]

Another challenge with electronic referrals is that sometimes there can be a discrepancy between

the patient represented on paper, and the patient in reality. This is particularly felt by health care

providers receiving patients from acute care and can create tensions between care settings as the

receiving unit often feels 'dumped on'.

> "I think there sometimes is a perspective that…you know, there's a lot of
> pressures for acute care beds and you know, what's the right transitional care
> environment for some of these patients. So…you know, you get referrals and
> sometimes you're like okay, we have criteria for what might be the expectations
> of somebody coming to a rehab unit." [FP21]

Although retirement homes do not have access to electronic documentation of hospitals, a similar

sentiment was felt by these health care providers with respect to the paper representation of

patients. Therefore, they combated this by implementing a face-to-face assessment process

which was seen as a key component to the success of their intake process.

> "Sometimes there is a bit of a push to get people out of the hospital, so we find it
> very helpful to make that [face to face] visit to ensure that someone is safe and
> that we are interpreting things the same way. When we say we can't provide

> assistive toileting, I mean someone has to get up off the chair and go to the
> bathroom themselves. Sometimes in the hospital they're interpreting that
> differently so you know, they might say 'well, as long as you're just standing
> beside them it's okay'... so that face-to-face is definitely the key to making sure
> that we have a good smooth transition." [RH1]

Face-to-face assessment was found to be reasonable for retirement homes to conduct, however it

may not be a feasible intake method for other care settings due to resource constraints. This

suggests that electronic records should be improved to facilitate the accurate electronic

representation of a patient.

Overall, despite the challenges associated with electronic records, health care providers

working within care settings with linked information systems were much more satisfied with the

amount and accuracy of information they receive. This ultimately facilitated the transition

between one care setting to the next.

Effective information transfer both within and between care settings is necessary to facilitate

smooth transitions

A strong working relationship between the care providers in the sending and receiving

care settings facilitates information sharing across care settings and helps ensure a smooth

transition.

> "To be honest if there is something significant that they really want us to know
> right away they will call us. We do, we meet with the other site periodically for
> different practice events so we know who they are right and they feel comfortable
> calling." [FP14]

Conversely, a lack of a relationship or understanding between care settings can be detrimental to

patient care. This was particularly felt throughout the interview with professionals in the LTC

home.

> "[We were] trying to approach the hospitals to talk to the orthopods about that.
> We haven't heard anything back yet. Because that's one of the things, because
> we want to build that connection and we hate to see people go from walking into a
> wheelchair because of a hip fracture." [LTC1]

Information transfer between health care professionals *within* each care setting is also important in facilitating smooth transitions. In both acute care and Freeport, daily 'bullet rounds' are conducted within a multidisciplinary team. 'Bullet rounds' is a term used to describe the process where members of the health care team share information regarding each patient's health and review the patient's care plan. However, in keeping with the challenges identified in the "multiple people involved in care" theme, bullet rounds were found to be much more useful within Freeport compared to acute care as demonstrated by the following quote:

> "On no, the bullet rounds sometimes we don't find very efficient or effective
> because they come and they give you this blurb of information and sometimes
> because the nurses change as well we who are constant know more about that
> patient than they do. So what they bring is valuable, except it's not consistent.
> So what we do is that we meet with them before or after anyway. So we're
> repeating conversations. So we don't find the bullet rounds that efficient or
> effective because of that." [AC5]

Team meetings were found to be very effective at Freeport Health Centre, and helped ensure that each care provider was up to date and the patient was following their care plan.

Information sharing with the patient and their family largely falls on longer-stay hospital settings

Although sharing information with the patient and family was touched on during interviews with acute care health providers, this important aspect of discharge planning was much more of an integral component of care within Freeport Health Centre. Part of the reason

for this discrepancy between the two hospital settings was acute care's focus on getting patients

out of the hospital quickly and, as discussed above, inconsistent staff. These factors hinder the

health care provider's ability to form strong relationships with the patient:

> "Like we might have a patient today that we know everything about. They're
> gone 3 days later, oh boy. Can't remember that patient." [AC1]

This was also expressed by staff at Freeport:

> "Unfortunately there's not much time for education at the acute care site so they
> [the patients] bring all their questions and frustrations here and everything needs
> to be answered yesterday." [FP13]

Similar to acute care, Freeport reflects the philosophy that 'if a patient does not need that level of

care then they should not be in the hospital', this was expressed to a much lesser extent. Instead,

the importance of preparing the patient and their caregiver to be able to manage and function

within the next care setting took precedence.

> "Sometimes they would like to know how can I help my mom or how can I help
> my dad you know go up the stairs, do this, do that and then you just show them.
> They're usually invited to observe a therapy session and that's when they learn
> and if they ask ok can I try to do that then by all means we spend time teaching
> them how to do things." [FP13]

Furthermore, there were more logistical steps taken to ensure patients and caregivers were well

prepared for their transition out of rehabilitation. For instance, a member of the health care team

is assigned to each patient as their primary contact in order to ensure the patient and family could

communicate easily with the team and to help reduce any redundancy. Also, goal setting was

discussed with patients upon admission, and at discharge patients were more likely to receive

written and verbal instructions regarding medications and follow-up doctors' appointments:

"So if they're younger or if they're fairly cognitively intact, the meds aren't very different, sometimes just give them prescriptions…For an older person whose got very complex meds maybe who cognitively is a little borderline. You know, or there has been lots of changes then we get pharmacy to do a written list for them. So they take prescriptions to take to their pharmacy, but we also do like a handwritten list in layman's terms...so when they get home they can see-well I'm taking this for this, and that's how much I take, you know." [FP12]

"Often if there's an orthopaedic surgeon follow-up, some not for weeks. Post discharge we always ask them to see their family doctor within a couple of weeks. And then we do have a written sheet that we give them with all those instructions too, but I always make sure I've told them verbally, right?" [FP12]

This emphasis on educating patients, and using multiple methods of information transfer (verbal and written) to convey important information to the patient and their family facilitates a much more positive transition by assisting in preparing the patient and family for their more active role at home and giving them the tools to manage their own or their loved one's health.

CHAPTER 3. ASSESSING THE VALIDITY OF THE CARE TRANSITIONS MEASURE

The following section describes the methodology, results, and discussion of the research

undertaken to assess the validity of the CTM and understand pertinent measurement and

transitional care issues from the patient's perspective. This component is comprised of both

quantitative and qualitative analyses and results which facilitate a more comprehensive

understanding of the CTM's ability to adequately assess care transitions for older MSK

rehabilitation patients. The quantitative and qualitative results are derived from the same

methodology, but the analyses and results are presented separately. This chapter concludes with

a discussion that combines the findings and discusses primary strengths and limitations.

3.1. METHODS

3.1.1. STUDY LOCATION

Participants were recruited from Grand River Hospital's (GRH) affiliated Freeport Health

Centre. Freeport Health Centre is located in Kitchener, Ontario, a smaller urban Canadian city.

GRH is one of Ontario's largest community hospitals and serves the Waterloo region, a

population of 420 000. Freeport Health Centre focuses on rehabilitation and complex continuing

care, and does not have many acute care services. Freeport Health Centre has approximately 200

inpatient beds and a fairly high outpatient volume.

Participants were recruited from two different units within Freeport Health Centre. The

first unit, the Functional Enhancement Unit, offers a program that falls under complex

continuing care. The Functional Enhancement program is low intensity, and tailored toward

individuals who will be going home or to a lower level of care. Patients in this program have a

high level of dependency and are required to be able to participate in 15 minutes of therapy each day. The second unit, General Rehabilitation, is an inpatient rehabilitation program. This program is more intense than the Functional Enhancement Unit, and requires the patient to participate in one to three hours of therapy per day.

3.1.2. PARTICIPANT RECRUITMENT

Participants (*n*=15) were recruited from Freeport Health Centre's inpatient rehabilitation units (General Rehabilitation Unit and Functional Enhancement Unit). Participants were recruited if they : i) were currently admitted in either Freeport Health Centre's General Rehabilitation Unit or Functional Enhancement Unit and transitioning to home (with or without home care, excluding nursing/long term care home); ii) had a musculoskeletal disorder, such as osteoarthritis, knee replacement, or hip fracture, as their most responsible diagnosis, excluding those with spinal cord injury and stroke; iii) were 60 years of age or older; and iv) were capable of participating in an interview in English (patients who had a major cognitive impairment and patients who were aphasic were excluded, as it was important for participants to be able to give informed consent and answer questions on their own). For patients with dementia, it has been found that their capacity to make an informed decision about study participation cannot be determined by standardized assessment tools or the diagnosis of dementia, and their capacity may change over the course of the study (Fisk, Beattie, & Donnelly, 2007). Therefore, capacity to consent was determined by the clinical judgment of the nurse practitioner, physiotherapists and occupational therapists. Data on cognitive impairment was obtained by the chart review where available.

Participants were recruited through a two phase consent process. Potential participants were identified primarily by a nurse practitioner and secondarily by therapists (Occupational

Therapists and Physiotherapists) at Freeport Health Centre. They were given a set of guidelines to assist them with identifying participants (Appendix B). They approached potential participants, informed them about the study, provided them with a brief information brochure describing the study components (Appendix C), an information letter (Appendix D) and a consent form (Appendix E) that indicated whether they would agree to be contacted and have a more thorough information session with the researchers. If the patient agreed to be contacted, as indicated by signing the consent to be contacted form, the University of Waterloo researchers visited the potential participant to further explain the study as well as provide a consent form for participating in the study itself (Appendix F). For those who decided to participate, a handwritten card that thanked them for their participation, reminded them of when the telephone survey would take place, and had both interviewers names on it, was provided. This written reminder was implemented based on existing literature regarding conducting research over the telephone with older adults (Worth & Tierney, 1993). Meeting the participants face-to-face provided the opportunity to build rapport, and has been found to be helpful for conducting successful telephone interviews with older adults (Worth & Tierney, 1993). All participant materials were assessed at a grade eight reading level or lower.

3.1.3. MEASURES

Telephone Survey

Study participation involved a telephone survey comprised of the 15 item CTM and four global questions created by the researchers based on care continuity research conducted by Haggerty and colleagues (2003; Appendix A and G, respectively). For more detail on the CTM, please refer to pages 15-16 of the background information section. It should be noted that throughout

administration of the CTM the word 'hospital' was substituted for 'Freeport Health Centre' to clarify that the participant was being asked about their transition from inpatient rehabilitation to home, not from acute care. The four global questions regarding the patient's transition were asked to help determine the validity of the CTM within this population, as well as whether or not they are receiving home care. Care continuity is an essential component of care transitions (Coleman & Boult, 2003); therefore three of the four global questions are based on the theory that continuity is multidimensional and comprised of three different types of continuity: informational, management, and relational (Haggerty et al., 2003). Informational continuity represents the use of adequate information to appropriately tailor the care of an individual. Management continuity indicates that the team of health care providers takes a consistent approach to treating the patient. Lastly, relational continuity refers to the presence of continuing therapeutic relationships with health care providers that help link care over time (Haggerty et al., 2003). Each of the three global questions corresponded to one of these domains. The fourth global question was used to determine an overall global ranking of the participant's perception of the quality of the transition. The face validity of these questions was assessed by a panel of experts on care transitions. The panel included investigators from the InfoRehab research consortium representing a range of knowledge in the fields of geriatrics, rehabilitation therapy, physical therapy and epidemiology. Patients and their caregivers were also included in the panel to represent potential participants. The panel reviewed the questions through a series of electronic iterations and subsequent revisions were made.

Functional Independence Measure

The FIM was developed to measure physical and cognitive disability (Granger, Hamilton, Keith, Zielezny, & Sherwin, 1986). Each FIM item is scored based on a scale ranging from 1-7, depending on the amount of functional assistance required, where 1= Total Assistance (person performs less than 25% of task independently), 2= Maximal Assistance (person performs at least 25% of task independently), 3= Moderate Assistance (person performs at least 50% of task independently), 4= Minimal Assistance (person performs at least 75% of task independently, and only needs touching to help perform task), 5=Supervision (person only requires someone to standby and provide cues or coaxing to perform task), 6= Modified Independence (person only requires assistive devices and no assistance from another person), and 7 = Complete Independence (person does not require assistive devices or assistance from another person).

Medical Record Abstraction Form

The medical record abstraction form used during the chart review (Appendix H) was based on the literature presented by Banks (1998) to ensure the reliability and usability of the form. Banks (1998) suggests that the items on the abstraction form should be numbered and that the order of the items should correspond with the order of information presented in the chart. Also, where possible codes should be consistent across items and the spaces for entering information should be visible and right justified.

3.1.4. STUDY PARTICIPATION

After being discharged from Freeport, the participant's hospital charts were reviewed to gather information on their health conditions/comorbidities, the number of medications taken post-discharge, and other information, including age, gender, and living arrangements e.g., living with caregiver. Information regarding current functional status as indicated by admission and

discharge Functional Independence Measure scores (FIM) was also gathered. The culmination of this information collected through the chart review provided a comprehensive description of the participants, and allowed the representativeness of this sample population to be compared with the sample used in the initial validation of the CTM. All data were entered into the medical abstraction form. Personal identifiers were not attached to participants' health information. Instead, an identification number was given to each participant's file, which was linked to other information pertaining to the participant that also did not have any personal identifiers. The guidelines outlined by Grand River Hospital's Privacy Office were followed.

Participants were contacted by the first interviewer 3 to 4 weeks after they had transitioned from Freeport Health Centre to their home. Administration of the CTM was given over the phone, a previously used means of data collection for this instrument (Parry et al., 2005). Please refer to Appendix I for the telephone script. Researchers who administered the CTM over the phone did so in a private and secure room at the University of Waterloo. Interviewers also recorded pertinent comments given by participants during the administration process by pen and paper. While interviews were not audio-recorded, efforts were made to write down these comments verbatim. These detailed comments gave additional insight into participants' thought processes, as well as appropriateness of the questionnaire itself. After completion of the telephone survey (CTM plus four global questions), the interviewer asked the participant if he/she would like to participate in a second administration of the telephone survey. This aspect of the study was used to determine inter-rater reliability. A consecutive sampling strategy was used. If the participant agreed to participate in the second part of the study, the participant was called back 6 to 10 days following the first administration. This

time frame was well within the 2 to 14 day time period usually recommended for studies administering two versions of the same test separated by a period of time (Norman & Streiner, 2000). A different researcher conducted all of the second administrations of the telephone survey in order to assess inter-rater reliability. This second administration of the CTM enabled inter-rater reliability of the instrument to be determined; a more conservative estimate of reliability testing that had not previously been completed with this measure.

3.1.5. STATISTICAL ANALYSES

Information gathered from the chart review and participant responses to the CTM and global questions were analyzed using PASW Statistics 18 (PASW, 2010). Descriptive statistics of participants obtained through the chart review were analyzed and are presented in the results section. Descriptive statistics of the total CTM score, each item of the CTM and each global question were also calculated and reported for time 1, rater 1, and time 2, rater 2.

In order to ascertain the reliability of the CTM, various analytical techniques were used. A measure of internal consistency, Cronbach's alpha, was calculated. Inter-rater reliability was assessed through two techniques: the intraclass correlation coefficient of the total CTM score and weighted and unweighted kappa statistics for each CTM item. The sample size calculation was based on the number of participants needed to determine the inter-rater reliability of the CTM, as assessed by the intraclass correlation coefficient. The sample size calculation method outlined by Kraemer and Thiemann (1987) was followed, using the formula: $\triangle = (\rho - \rho_o)/(1 - \rho\rho_o)$, where ρ is the estimate of the desired correlation and ρ_o is the value specified in the null hypothesis. The correlation of import, ρ, was set at 0.8, as suggested by Streiner (1993) and the null hypothesis, ρ_o, was set at 0, or no correlation. Using the master table in Appendix K, 80% power, a

conventional alpha level of 0.05, and a two-tailed test, a value of $v=10$ was attained. Using the formula, n = v + 1, it was determined that a sample size of 11 would be needed to determine inter-rater reliability. The method of intraclass correlation coefficient used was a two-way random effects model using an absolute agreement definition and average measures reliability. A two-way random effects model was chosen. A two-way model allowed for separate systematic and random error terms and was appropriate for the present study as each researcher administered the scale to each participant involved in the inter-rater reliability calculation. A random effects model was appropriate as interviewers or raters were considered to be a random sample of a larger population of raters, thereby allowing the generalizability of results. Absolute agreement was used rather than consistency as it is a more conservative estimate of reliability and includes both random and systematic error, whereas consistency models only include random error (McGraw & Wong, 1996). Averaged measures reliability was used as more than one rating for each subject was taken. Using the same method of analysis, an intraclass correlation coefficient was calculated to determine the inter-rater reliability of the global questions. To interpret the magnitude of the intraclass correlation coefficient the guidelines of Cicchetti and Sparrow (1981) were followed, where an intraclass correlation coefficient above 0.75 is excellent, between 0.6 and 0.74 is good, between 0.40 to 0.59 is fair, and 0.39 or below is poor. Kappa statistics were calculated to determine the "true" agreement, agreement beyond chance (Sim & Wright, 2005), between the scores on the CTM administered by rater 1 and rater 2 across two different times for each participant. It should be noted that kappa only indicates the level of agreement or disagreement, not whether the disagreement is caused by random or systematic differences. Since the CTM is an ordinal scale, weighted kappa was used in order to

retain the original order of the response set and more accurately reflect the magnitude of any disagreements between time 1, rater 1 and time 2, rater 2. Conventional quadratic weights were used, as recommended by Streiner (1995). Quadratic weighting refers to the process where the disagreement between raters is weighted by the square of the number of levels separating their ratings (Streiner, 1995). To interpret the magnitude of kappa, the guidelines delineated by Landis and Koch (1977) were used: ≤ 0 = poor agreement, 0.01-0.20 = slight agreement, 0.21-0.40 = fair agreement, 0.41-0.60 = moderate agreement, 0.61-0.80 = substantial agreement, and 0.81-1.00 = almost perfect agreement.

Construct validity was also assessed by performing a series of Pearson-product moment correlations between the CTM final score and each global question. This was also completed for the three-item version of the CTM in an effort to compare its construct validity with that of the 15-item version under study. In addition, following one of Coleman and colleagues' (2005) methods of measuring construct validity, the CTM final score was correlated against participant length of hospital stay and participant age. Correlating the CTM final score with the global questions and with the length of hospital stay tests the convergent validity of the CTM, whereas correlating the CTM final score with participant age tests the divergent validity of the CTM. Correlations greater than 0.60 were considered to demonstrate acceptable validity (McDowell, 2006). A correlation of 0.60 between two measures indicates a strong association as the degree to which a scale is unreliable has been found to attenuate the resulting validity coefficient (McDowell, 2006).

3.1.6. *QUALITATIVE ANALYSES*

Throughout the administration of the CTM, interviewers found that respondents were

often treating the items as open-ended questions rather than following the prescribed response options. An effort was made to write down pertinent comments made throughout the telephone survey verbatim. Therefore, rich qualitative data were gathered that provided additional information to elucidate why the participant was choosing the certain response option as well as offering insight into how the participant perceived the items or the questionnaire in general. Qualitative analysis was used to analyze this unprompted narrative given by participants during administration of the CTM. This analysis focused on the identification of themes, trends and underlying meanings. Analysis was performed using NVivo 8 (QSR International, 2008). Analysis involved coding as outlined by Lofland et al. (2006), including initial coding, followed by focused coding. Initial coding was carried out through the creation multiple codes and categories, with the possibility of the same piece of information being assigned various codes. Focused coding involved reviewing the initial codes that were created, then irrelevant codes were eliminated, common codes were subdivided, and codes were organized or linked into themes (Lofland & Lofland, 1995). An example of an initial code used was 'been through it before so learned process' and a corresponding example of a focused code used was 'facilitators of smooth transitions'.

3.2. RESULTS

3.2.1. QUANTITATIVE RESULTS
Sample characteristics

The final sample consisted of 15 individuals who participated in the first administration of the study and 10 individuals who participated in both the first and the second administrations of the telephone survey. Study participation commenced an average of 3.6 weeks after being

discharged from the hospital. Of the 15 individuals that participated in the study, eight (53.3%) were female and seven (46.7%) were male. The age range was 61 to 89 years, with a mean age of 77.2 years ($SD = 7.8$). The majority of participants had a primary diagnosis of Hip Replacement (40%; 6), followed by Hip Fracture (33.3%; 5), then Knee Replacement (13.3%; 2), and other MSK disorders (13.3%; 2). Participants on average had 5.3 ($SD = 2.7$) comorbidities, with osteoarthritis and hypertension being the most common comorbidities (73.3%; 11 and 60%; 9 of the sample, respectively). Participants spent an average of 31 days in inpatient rehabilitation ($SD = 29.6$); three participants had a hospital stay of 72 days or over. Excluding these three participants, the average hospital stay within inpatient rehabilitation was 17.3 days ($SD = 7.0$) ranging from 6 to 33 days. Thirteen participants (86.7%) received some form of home care upon discharge from Freeport Health Centre. Table 1 compares the present study's patient population to the participants in the initial CTM validation study.

Table 1. Comparison of demographic characteristics in present study to demographic characteristics in Coleman and colleagues study (2005)

Present Study		Coleman et al., 2005	
Characteristic	Value	Characteristic	Value
n	15	n	200
Age	*M*=77.2 years	Age	*M*=67.2 years
Gender		Gender	
• Male	46.7%	• Male	40%
• Female	53.3%	• Female	60%
Primary Diagnosis		Primary Diagnosis	
• Hip replacement	40.0%	• COPD	55.0%
• Hip fracture	33.3%	• Congestive	35.0%
• Knee	13.3%	heart failure	
replacement		• Stroke	4.0%
• Other MSK	13.3%	• Hip fracture	3.5%
		• Other	2.5%

| Length of hospital stay | M=17.3 days SD=7.0 | Length of hospital stay | M=4.7 days SD=3.1 |
| Home care received | 86.7% | Home with home health | 6.0% |

Additional demographic characteristics were obtained through the chart review for the present study. All participants were found to be cognitively intact. Average FIM scores at admission and discharge for the motor and cognitive subscales are presented for each item in Tables 2 and 3. The number of participants included for each item is noted in the table, as participants in the Functional Enhancement Unit are not administered the FIM, and the FIM was not fully completed for all participants. Although the number of medications at discharge was unavailable for three participants, the remaining 12 participants went home with an average of 6.8 medications, ranging from 0 to 11. The majority of participants lived alone (53.3%; 8), others lived with their spouse/partner (33.3%; 5), or another family member (13.3%; 2). All participants received informal care after being discharged from the hospital, and all were discharged to their pre-hospital living setting, which was primarily home (80%; 12), followed by home with paid health services (6.7%; 1), boarding house (6.7%; 1), and assisted living or retirement home (6.7%; 1).

Table 2. Functional Independence Measure: Motor subscale at admission and discharge

| FIM Motor Items (1-7) | Admission | | | | Discharge | | | |
	n	Min-Max	M	SD	n	Min-Max	M	SD
Eating	11	5-7	6.8	0.6	13	6-7	6.9	0.3
Grooming	11	3-7	6.4	1.3	12	7-7	7.0	0.0
Bathing	11	1-5	3.9	1.3	12	5-6	5.5	0.5
Dressing – upper body	11	2-7	6.3	1.6	13	4-7	6.7	0.9
Dressing – lower body	11	1-6	4.6	1.4	13	4-6	5.8	0.6
Toileting	12	2-6	4.7	1.8	12	6-6	6.0	0.0

Bladder management	12	2-6	5.6	1.2	12	6-7	6.4	0.5
Bowel management	12	2-6	5.6	1.2	12	6-7	6.4	0.5
Transfers: bed, chair, wheel chair	13	4-6	4.6	1.0	11	6-6	6.0	0.0
Transfers: toilet	12	3-6	5.0	0.4	11	6-6	6.0	0.0
Transfers: tub or shower	11	2-5	4.3	0.9	10	4-6	5.2	0.6
Locomotion Score	11	2-6	3.9	1.5	12	5-6	5.8	0.4
Locomotion: stairs	11	0-5	2.5	1.9	12	1-6	4.8	1.7

Table 3. Functional Independence Measure: Cognition subscale at admission and discharge

	Admission				Discharge			
FIM Cognition Items (1-7)	*n*	Min-Max	*M*	*SD*	*n*	Min-Max	*M*	*SD*
Comprehension	10	6-7	6.7	0.5	11	6-7	6.6	0.5
Expression	10	7-7	7.0	0.0	11	7-7	7.0	0.0
Social interaction	10	7-7	7.0	0.0	11	7-7	7.0	0.0
Problem Solving	10	5-7	6.8	0.6	10	5-7	6.8	0.6
Memory	10	5-7	6.8	0.6	10	5-7	6.8	0.6

Validation of Care Transitions Measure

Descriptive Statistics

Following the guidelines delineated by Coleman and colleagues (2003; Appendix A), an aggregate score on the CTM-15 was calculated for each participant. This score underwent a linear transformation, resulting in a final score between 0 and 100 (lower scores indicate a poor transition and higher scores indicate a good transition). This yielded an average score of 72.3 (*SD* = 16.6). This score is slightly higher than the average final score of 67.3 (*SD*=13.7) obtained by Coleman and colleagues (2005). Average scores of each item in the CTM, the final score on the CTM and the global questions were calculated for time 1, rater 1 and time 2, rater 2, presented in Tables 4 and 5. Overall, most scores are greater than 3, indicating that participants agreed with the statements. Only two items at time 1 had a mean less than 3, items 7 and 15,

indicating that the CTM does have some variation in the frequency of item endorsement,

suggesting that it can point to potential areas of improvement.

Table 4. Descriptive statistics for each CTM item for the first and second administrations

Item	Time 1, Rater 1						Time 2, Rater 2					
	Range	*Mode*	SD	D	A	SA	Range	*Mode*	SD	D	A	SA
1. Before I left the hospital, the staff and I agreed about clear health goals for me and how these would be reached.	2.0	3.0	0	2	7	5	2.0	3.0	0	1	6	3
2. The hospital staff took my preferences and those of my family or caregiver into account in deciding **what** my health care needs would be when I left the hospital.	2.0	3.0	0	2	7	6	1.0	3.0	0	0	7	3
3. The hospital staff took my preferences and those of my family or caregiver into account in deciding **where** my health care needs would be met when I left the hospital.	1.0	3.0	0	0	9	6	2.0	3.0	0	1	7	2
4. When I left the hospital, I had all the information I needed to be able to take care of myself.	2.0	3.0	0	1	8	6	1.0	3.0	0	0	7	3
5. When I left the hospital, I clearly understood how to manage my health.	2.0	3.0	0	1	9	5	1.0	3.0*	0	0	5	5
6. When I left the hospital, I clearly	2.0	3.0	0	2	8	4	2.0	3.0*	0	1	4	4

understood the warning signs and symptoms I should watch for to monitor my health condition.												
7. When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going to be met.	3.0	3.0	1	5	6	3	2.0	4.0	0	1	4	5
8. When I left the hospital, I had a good understanding of my health condition and what makes it better or worse.	2.0	3.0	0	2	9	4	3.0	3.0	1	0	6	3
9. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.	2.0	3.0	0	1	9	5	2.0	4.0	0	1	4	5
10. When I left the hospital, I was confident that I knew what to do to manage my health.	2.0	3.0	0	1	9	5	1.0	3.0	0	0	5	5
11. When I left the hospital, I was confident I could actually do the things I needed to do to take care of my health.	2.0	3.0	0	1	10	4	1.0	3.0	0	0	6	4
12. When I left the hospital, I had a readable and easily understood written list of the	2.0	3.0	0	2	8	4	3.0	3.0	1	0	5	4

appointments or tests I needed to complete within the next several weeks.												
13. When I left the hospital, I clearly understood the *purpose* for taking each of my medications.	2.0	3.0	0	2	8	14	2.0	3.0	0	1	6	3
14. When I left the hospital, I clearly understood *how* to take each of my medications, including how much I should take and when.	2.0	3.0	0	1	7	5	1.0	3.0	0	0	6	4
15. When I left the hospital, I clearly understood the possible *side effects* of each of my medications.	2.0	3.0	0	5	8	1	2.0	3.0	0	1	5	4
CTM Final Score (0-100)	40.5-97.8	Mean (SD) = 72.3 (16.6)					48.9 – 100.0	Mean (SD) = 76.9 (16.6)				

* Multiple modes exist, smallest one shown in table

Table 5. Descriptive statistics for each global question for the first and second administrations

Item	Time 1, Rater 1			Time 2, Rater 2		
	Min-Max	*M*	*SD*	Min-Max	*M*	*SD*
Overall, I was given the information I needed during my move from Freeport Health Centre to home.	2-10	8.3	2.2	4-10	8.9	2.0
Overall, the different care providers worked well with each other to manage my care as I moved from Freeport Health Centre to home.	6-10	9.1	1.3	2-10	8.7	2.6
Overall, the health providers involved in my move from Freeport Health Centre to home took the time to develop a relationship with me.	3.5-10	8.5	1.9	7-10	9.6	1.0
Overall, how would you rate the quality of your move from Freeport Health Centre to home?	7-10	9.5	0.9	8-10	9.7	0.7

Reliability

For the 10 participants who participated in the second part of the study, inter-rater reliability of the CTM was analyzed using kappa statistics for each item and an intraclass correlation coefficient (ICC) for the overall score. Weighted kappa statistics were calculated for each item and are presented in Table 6. It should be noted that the relatively small sample size prohibited some standard errors and/or confidence intervals to be calculated, indicated by the term 'nc'. Due to the propensity of respondents to answer positively, prevalence likely impacted the value of kappa as agreement by chance is high and therefore kappa is lowered (Sim & Wright, 2005). Items 6, 13, 14, and 15 contained the response option "Don't know/Don't remember/Not applicable". For the purpose of comparison, this response option was treated as missing data, resulting in an *n* of eight for item 6, and an *n* of nine for items 13, 14, and 15. This response option was selected only 5 times by participants across the 4 items. For these 4 items, unweighted kappa statistics were also calculated to include the response option "Don't know/Don't remember/Not applicable" within the kappa calculation. This resulted in unweighted kappa values of 0.24 (*SE*=0.2), 0.14 (*SE*=0.3), 0.44 (*SE*=0.3), and, for items 6, 13, and 14, respectively. For item 15, an unweighted kappa value could not be calculated as observed concordance was smaller than mean chance, indicating that the agreement between raters was less than what could have been attained randomly. These values are all considerably lower than the weighted kappa statistics for these items presented in Table 6. The lack of any agreement between the "Don't know/Don't remember/Not applicable" response options at time 1 and time 2 likely contributed to these lower values.

As evident in Table 6, the majority of items demonstrated slight or moderate agreement,
four items demonstrated fair agreement and only one item demonstrated substantial agreement
(Landis & Koch, 1977). However, the overall agreement for the total score was excellent as
indicated by an ICC value of 0.77 (p=0.03; Cicchetti & Sparrow, 1981). The CTM also
demonstrated high internal consistency; a Cronbach's alpha of 0.94 was attained which is in line
with previous results (Coleman et al., 2005).

Table 6. Weighted kappa, standard error, and confidence interval for each item of the CTM

CTM Item	Kappa with quadratic weighting	*SE*	95% Confidence Interval
1. Before I left the hospital, the staff and I agreed about clear health goals for me and how these would be reached.	0.62	0.8	0-1
2. The hospital staff took my preferences and those of my family or caregiver into account in deciding **what** my health care needs would be when I left the hospital.	0.43	0.4	0-1
3. The hospital staff took my preferences and those of my family or caregiver into account in deciding **where** my health care needs would be met when I left the hospital.	0.43	0.4	0-1
4. When I left the hospital, I had all the information I needed to be able to take care of myself.	0.24	nc	nc
5. When I left the hospital, I clearly understood how to manage my health.	0.40	0.4	0-1
6. When I left the hospital, I clearly understood the warning signs and symptoms I should watch for to monitor my health condition.	0.5	0.7	0-1
7. When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going to be met.	0.43	0.3	0-1
8. When I left the hospital, I had a good understanding of my health condition and what makes it better or worse.	0.12	nc	nc
9. When I left the hospital, I had a good understanding of the things I was responsible	0.29	nc	nc

for in managing my health.			
10. When I left the hospital, I was confident that I knew what to do to manage my health.	0.20	nc	nc
11. When I left the hospital, I was confident I could actually do the things I needed to do to take care of my health.	0.17	nc	nc
12. When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks.	Not calculated – observed concordance smaller than mean-chance		
13. When I left the hospital, I clearly understood the *purpose* for taking each of my medications.	0.36	nc	nc
14. When I left the hospital, I clearly understood *how* to take each of my medications, including how much I should take and when.	0.55	1.1	0-1
15. When I left the hospital, I clearly understood the possible *side effects* of each of my medications.	0.13	nc	nc

The inter-rater reliability of the global questions ranged from excellent to poor. The first

global question assessing informational continuity and the fourth global question assessing

overall transition quality both demonstrated excellent inter-rater reliability, with an ICC = 0.76,

p=0.03 and ICC=0.79, p=0.01, respectively. The third global question assessing relational

continuity had fair inter-rater reliability (ICC=0.53, p=0.12), and the second global question

assessing management continuity had poor inter-rater reliability (ICC=0.35, p=0.25). This poor

inter-rater reliability for the second global question is likely attenuated due to one participant's

highly discrepant scores between time 1 and time 2.

Validity

Pearson-product moment correlations were performed between the total score of the

CTM at time 1 and each of the four global validation questions to assess the construct validity of

the CTM. The results of the correlation analysis in Table 7 show that 3 of the 4 correlations were

statistically significant. The CTM final score correlated highest with the global question

assessing the overall care transition quality, followed by the global question that assessed

informational continuity. The magnitude of these two correlations is considered to be acceptable

based on the a priori condition that the correlation coefficient is greater than 0.60. Although the

correlation between the CTM final score and the global question that assessed management

continuity was significant, it does not reach the a priori condition of acceptability. Finally, the

CTM did not significantly correlate with the global question that assessed relational continuity.

Table 7. Correlations for the CTM final score against each of the global questions

Correlation examined	Pearson Correlation Coefficient	Significance Level
CTM Final Score vs. Global Question 1. Informational Continuity	0.65**	0.009
CTM Final Score vs. Global Question 2. Management Continuity	0.52*	0.046
CTM Final Score vs. Global Question 3. Relational Continuity	0.32	0.243
CTM Final Score vs. Global Question 4. Overall transition quality	0.67**	0.007

As evident in Table 8, the correlations between the final score on the three item version of the

CTM and the global questions followed the same general trend as above. However, only the

fourth global question assessing overall transition quality was considered acceptable based on the

a priori condition of a correlation coefficient greater than 0.60, although the correlation

coefficients of both the first and second global questions approach this level of acceptability. The

correlation between the CTM-3 and the CTM-15 was strong. Squaring this correlation

coefficient resulted in a value of 0.48, indicating that the three items contributed to 48% of the

variance in the 15 item CTM.

Table 8. Correlations for the three item CTM final score against each of the global questions and

the 15 item CTM final score

Correlation examined	Pearson Correlation Coefficient	Significance Level
CTM-3 Final Score vs. Global Question 1. Informational Continuity	0.57*	0.027
CTM-3 Final Score vs. Global Question 2. Management Continuity	0.54*	0.037
CTM-3 Final Score vs. Global Question 3. Relational Continuity	0.36	0.193
CTM-3 Final Score vs. Global Question 4. Overall transition quality	0.62*	0.015
CTM-3 Final Score vs. CTM-15 Final Score	0.69**	0.004

Following Coleman and colleagues' (2005) method of assessing construct validity of the CTM,

the CTM final score was correlated with length of hospital stay and age. Length of stay was

significantly, negatively correlated with CTM final score (r= -0.53, p=0.04) and age was not

significantly correlated with CTM final score (r= -0.009, p=0.97). These results differed from

Coleman and colleagues (2005), who obtained a small, positive correlation between CTM final

score and hospital length of stay (r=0.14, p=0.05), and a small, negative correlation between

CTM final score and age (r=-0.16, p=0.03).

3.2.2. QUALITATIVE FINDINGS AND INTERPRETATIONS

The findings from this analysis are presented first as they pertain to each of the CTM items, then secondly as overarching themes composed of information gathered throughout the entire telephone survey administration. A diagram to summarize the main points within each theme is presented at the end of the section.

Item 1. Before I left the hospital, the staff and I agreed about clear health goals for me and how these would be reached.

This item elicited the most confusion from participants; the majority of participants needed the statement to be repeated and/or clarified. Generally, participants discussed the more tangible aspects of their health care in response to this question. For instance, they remarked that they knew about follow-up appointments, therapy at home, and the need for assistive devices. Only one person discussed how the therapy staff were going to foster her independence to ensure she was able to cope at home. Another participant noted that while health care providers discussed goals with her, *how* these goals would be reached was not.

Item 2. The hospital staff took my preferences and those of my family or caregiver into account in deciding **what** *my health care needs would be when I left the hospital.*

Overall, this item seemed to be well understood by participants; however, one participant had difficulties understanding the term 'health care needs'. Another respondent felt that this item, and the following item, were really asking the "the same thing", as he was the primary caregiver for his wife at home. Most participants who offered comments to this item made the distinction between what they versus their family knew and/or thought. This indicates that there

may be challenges with the wording of this item and it is difficult for respondents to interpret due to its double-barreled nature.

*Item 3. The hospital staff took my preferences and those of my family or caregiver into account in deciding **where** my health care needs would be met when I left the hospital.*

Very few comments were elicited by this item. One participant mentioned although the health care providers took into account where she wanted to be discharged, they did not take into account where her physiotherapy would be administered. At the time of survey administration, she still was unsure whether she would have to go to outpatient rehabilitation or have a physiotherapist into her home. Another participant remarked that it was only the Community Care Access Centre (CCAC) case manager at Freeport Health Centre who took her needs into account, otherwise, she felt as though she was "in the dark".

Item 4. When I left the hospital, I had all the information I needed to be able to take care of myself.

This item evoked quite a few unprompted comments from participants. Some commented on the distinction between having the information to take care of themselves and actually being well enough to take care of themselves, reflecting the sentiment of Item 11. Generally, participants talked about having supportive aides in place.

Item 5. When I left the hospital, I clearly understood how to manage my health.

Very few comments were made by participants for this item, and there was no need to repeat or clarify statement.

Item 6. When I left the hospital, I clearly understood the warning signs and symptoms I should watch for to monitor my health condition.

This item had the greatest frequency of participants who were unsure how to respond. Some comments related to feeling as though this item was not applicable for them or they were unable to recall what signs or symptoms to watch for.

Item 7. When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going to be met.

Overall, this item was well understood by most participants; only two participants needed clarification and this item prompted most participants to elaborate on what information they received. Interestingly, many people seemed hesitant to disagree with this item although they could not specifically recall receiving a written plan. Participants remarked that they received "a lot of stuff", perhaps indicating that despite receiving ample documentation the format was not conducive for participants to actually read.

Item 8. When I left the hospital, I had a good understanding of my health condition and what makes it better or worse.

Generally, the comments from this item had a negative tone; people were not very clear on what makes their condition better or worse. One participant remarked "I didn't really have a good picture myself!"

Item 9. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health. and;

Item 10. When I left the hospital, I was confident that I knew what to do to manage my health.

Participants had very few responses for these two items, other than to remark that the statements seemed repetitive.

Item 11. When I left the hospital, I was confident I could actually do the things I needed to do to take care of my health.

Generally, responses centered on differentiating between what participants could actually do as opposed to what they thought they could do or wanted to do. One respondent commented, "I guess I agree – I need to take it easy but I want to do more!". One participant commented that although items 9 and 10 felt repetitive this item was actually quite different.

Item 12. When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks.

Some participants stated that they did not receive a written list of appointments or were unsure about receiving this list. Regardless of whether they had actually received a written list, the majority of respondents reported when their follow-up appointments were in response to this item, indicating that they not only had appointments scheduled but were aware of them.

Item 13. When I left the hospital, I clearly understood the purpose for taking each of my medications. and;

Item 14. When I left the hospital, I clearly understood how to take each of my medications, including how much I should take and when.

Very few comments were made for either of these items. One participant remarked that both statements were not applicable as she was taking the same medications prior to hospitalization. Another participant stated that she was "very impressed with Freeport".

Item 15. When I left the hospital, I clearly understood the possible side effects of each of my medications.

Participants generally commented on medication side effects based on their own opinion rather than information provided to them by health care providers, as demonstrated by the following quotes:

"I've never had a side effect so far!"

"I read some of them [labels], don't think any of the side effects are too bad."

"I only took two pills that made me feel groggy – the pain was not severe enough compared to the severity of the pill's side effects. I was never forewarned about this."

"I told them [health care providers] what my side effects would be."

"I don't think there would be any side effects, I'm only on blood thinners and stool softeners."

There was also a range of comments regarding the health care providers' ability to communicate information about side effects of medication. One participant was amazed with the detail of the medication print-out, another stated that "they did not discuss meds with me period", and another thought that her pharmacist played a greater role in educating her about the potential side effects.

CTM Total. Other pertinent comments

A few participants commented on the arbitrary nature of "Strongly Agree" versus "Agree", stating "Either you agree or you don't!". Others only implied this sentiment through their comments:

"I don't know why I keep saying 'agree' and not 'strongly agree' – I guess I just don't want you to think I'm not listening by choosing 'strongly agree' all the time!"

"Should I be saying agree or strongly agree?"

Theme 1. Participants were appreciative of time spent within inpatient rehabilitation

Participants were generally very positive about their experience at Freeport Health Centre. Respondents expressed appreciation toward their health care providers, particularly CCAC case managers and therapists. Case managers seemed to be most relevant in terms of providing information upon discharge and ensuring they received the proper assistive devices and care at home. The physiotherapists and occupational therapists were most commonly mentioned within the context of preparing participants functionally to return home. Participants viewed physiotherapy as the most important component of their care at Freeport Health Centre and fundamental to their independence and ability to return home.

> "Rehab prepared you for lots of situations. It builds up your confidence so you can deal with situations at home."

Participants also talked about the importance of rehabilitation exercises and the therapy staff in terms of benefiting their psychological health:

> "Rehabilitation had recreational activities that made everyone feel good. Relaxation therapy – soft music – taught you how to relax. There was a painting one too – where I made a silk scarf. Activities gave morale a boost – it was very positive."

Theme 2. Written information may not be provided in most effective format for patients

Based on participants' unprompted comments throughout the telephone survey, information may not be presented in the most accessible and readily interpretable format for older patients. Participants remarked that information provided should be more detailed and lacked clarity:

> "More explanation about medications would have been better."

> "No, I have guidelines, but I wished they were clearer."

Furthermore, the large amount of information given at discharge may deter patients from reading important information relevant to their care at home and self-management of their condition.

> "I got a lot of stuff, a lot of paperwork…I'm not so good with paperwork. I don't recall having it written, but there was a plan. I figure they [health care providers] would likely say they gave me a written plan."

Other participants commented that they did not receive pertinent information at all. These comments pertained to information that could facilitate the transition from hospital to home.

> "I did not receive any written instructions, but I didn't need them. But they would have been good to have."

Overall, the qualitative data indicate that the transfer of written information between the patient and health care providers may not be adequate, in some cases.

Theme 3. System constrains effective communication between health care providers and patients

Participants identified system constraints as they related to effective communication with health care providers. One of these challenges stemmed from the apparent lack of availability of health care providers. Many commented that the hospital staff were always in a rush and did not have enough time to build rapport with patients.

> "Nurses rushed too much. 'Just a minute!', well, their minutes aren't like my minutes!"

> "They [health care providers] don't have time to build a relationship. It was satisfactory though."

This led to challenges relating to verbal communication with health care providers. Furthermore, some participants felt as though they did not receive enough information from health care providers, implying that the hospital staff were withholding the information:

> "I think the doctor always had a plan, just would never tell me what was going on."

Another system constraint brought up by one participant who was in the hospital over holidays was the problem of inconsistent therapy staff.

> "I had 3 main physiotherapists over 2 weeks – each one had a different attitude… I

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> understand that everyone needs holidays, but in order for people to get better they really need physio two times a day, and that to miss it for the holidays was detrimental. I also think physio is very important mentally – on holidays you didn't really have anyone to interact with because they were gone."

Similarly, having multiple people involved in care was also brought up as a challenge by some respondents as they received conflicting information from different health care providers. This placed patients in a difficult situation as they were unsure which health care professionals' directions to follow.

> "I talked to my doctor about walking on my own, without my walker, and was scared to admit I was doing it. But the doctor said it was good to strengthen my legs…But my PSW [Personal Support Worker] and CCAC don't think it is good – they think I should be using my walker. So I don't know. I'm mostly just walking on my own in my apartment."

Based on this information, in conjunction with Theme 1, although participants generally viewed the staff at Freeport Health Centre very positively, some system constraints led to communication difficulties that could be remedied.

Theme 4. Factors surrounding patient complexity impact successful discharge from hospital to home

All participants involved in the study were older, complex rehabilitation patients. This medical complexity impacted all aspects of patient care, and was particularly noted by participants as it pertained to the both ends of the transition process from hospital to home. Personal challenges relating to functional or psychological difficulties were discussed by patients. For some, these functional challenges were present before they were hospitalized, and a certain level of mobility needed to be attained before they were able to return home. Conversely, the psychological challenges associated with returning home were often not apparent until after transitioning from the hospital:

>"I cried every day the first week I was home. I was gone [in hospital] for 4 months so it was a big difference being back. No one is there, no one cooks your meals for you, everything costs money and I don't have much."

Although these difficulties stem from the complexity of the patient, hospitalization often exacerbated these challenges that were already present. Complications occurring within hospital, generally resulting from treatment or a lack thereof, ultimately delayed rehabilitation and decreased their independence. One patient remarked:

>"I was in bed all the time. My left foot blistered because I wasn't moving. This added to difficulties with my care, even in rehab."

Patient complexity also influenced the care participants received once they were out of the hospital. In order to facilitate a smooth transition home, the large majority of participants required home care and/or assistive devices to be used or installed within the home. Although home care was viewed as an important component of a safe transition home, some felt that it was not adequate:

>"I need help with bathing but I don't get any help – but my 65 year old neighbor across the way gets all the help she needs. I guess you have to complain to get any help, but I'm not like that."

>"The door of my apartment is too heavy to get out. I can't leave unless home care is here."

Many participants talked about the need to have logistical considerations in place before returning home. For instance, arranging any needed modifications to the home and ensuring that the appropriate care and assistive devices were available upon return to home were most commonly discussed. Some participants also discussed how having gone through a similar situation before facilitated their transition from hospital to home. Part of the reasoning for this stemmed from having assistive devices already in place e.g., grab bars. However, another aspect

seemed to be derived from an overall familiarity with the process of being hospitalized and

undergoing surgery:

> "I went through a hip replacement before. I already knew what all the side effects
> would be. So I think I learned a lot from that so this transition went much
> smoother."

Patient complexity was an important component influencing both sides of the transition

process. Patient complexity may delay or complicate the discharge process from hospital

and necessitates the implementation of assistance within the home.

Figure 1. Summary diagram depicting themes and main points derived from responses elicited by CTM administration

Themes derived from responses elicited by CTM administration

Theme 1. *Participants were appreciative of their time spent within inpatient rehabilitation*
  ➢ Appreciated staff
  ➢ Rehabilitation very important

Theme 4. *Factors surrounding patient complexity impact successful discharge from hospital to home*
  ➢ Functional/psychological challenges
  ➢ Hazards of hospitalization
  ➢ Logistical considerations need to be in place prior to returning home

Theme 2. *Written information may not be provided in most effective format for patients*
  ➢ Lacked information
  ➢ Lacked clarity of information
  ➢ Large amount of information not conducive to reading

Theme 3. *System constrains effective communication between health care providers and patients*
  ➢ Staff lacked time
  ➢ Multiple providers involved in care

CHAPTER 4. OVERALL DISCUSSION, STRENGTHS AND LIMITATIONS, AND CONCLUSIONS

4.1. OVERALL DISCUSSION

The first component of the study involved a series of qualitative health care provider interviews to explore issues surrounding care transitions across the care continuum. As discussed in the background section of my thesis, there are several factors that can facilitate care continuity and smooth care transitions from one care setting to the next. Findings from the health care provider interviews are discussed within the context of this literature, particularly for the transitions from acute care and from inpatient rehabilitation or complex continuing care.

One of the main factors impacting continuity of care identified in the literature and the health care provider interviews is the transfer of information between health care providers both within and across care settings and among health care providers, patients and caregivers. Timely and accurate information exchange between care providers across the continuum of care are major health systems issues (Naylor 2002; Spragins et al., 2008; Schoen et al., 2007) and this finding was echoed throughout the interviews. Although health care providers involved in the transition between care settings who were operating with linked electronic information systems were generally more content with the amount of available information and the ease at which they could access pertinent information, challenges surrounding missing information or a lack of clarity of information provided were found. This suggests that electronic systems are not being used to their full potential, and that further attempts should be made to standardize how information is being shared. Furthermore, the link between acute care and LTC seemed to be the most contentious with respect to the amount of information received. Despite attempts on behalf

of the LTC staff to build a better connection between the two care settings, very little progress has been made. This is especially disconcerting because patients being admitted or re-admitted to LTC are generally the most medically complex, and are therefore at a heightened risk of a poor transition. Furthermore, patients transitioning to care settings with a high level of support are not captured by the most prominent measure assessing care transition quality, the CTM. Therefore, transition quality of this high risk population is currently not able to be assessed. Consequently, further research needs to be conducted in order to help facilitate this communication between care settings without linked electronic charting systems and capture transition quality for these complex patients.

Information exchange and education of patients and caregivers regarding self-management of their condition and medications has historically been inadequate (Graham et al., 2009; McWilliam & Sangster, 1994; von Eigen et al., 1999; Weaver et al., 1998). Through the health care provider interviews, it was evident that there was a noticeable divide between acute care and Freeport surrounding their ability to prepare patients and their family for the next care setting. Individual health care providers within Freeport focused on educating patients regarding any changes to their medication, setting goals for the patient to work toward, and discussing ways to ensure safety within the next care setting. Furthermore, compared to acute care, the system within Freeport better facilitated patient and caregiver preparation for the next care setting. Freeport programs had a longer length of stay and had less pressure for early discharge which was better suited to the complexity of the patient population. Furthermore, the use of a primary contact at Freeport reduced redundancy and enhanced patient, caregiver, and health care provider communication. Potential benefits and challenges of having a primary contact for

patients and their families should be evaluated and the feasibility of implementing a primary contact in other care settings should be addressed.

Freeport Health Centre's system is also beneficial in that more consistent staff coupled with the designation of a primary caregiver helps facilitate the development of a patient-health care provider relationship. Haggerty and colleagues (2003) found that patients' perception of a relationship with their health care providers, termed relational continuity, is conducive to care continuity indicating that this component of continuity would be high for patients transitioning from Freeport. Contrastingly, due to the fast-paced environment and inconsistent staff within the acute care environment, it is unlikely that relational continuity is strong, and therefore transition quality likely suffers in comparison to transitions from inpatient rehabilitation or complex continuing care. Interestingly, as discussed in more detail below, although the results from the health care provider interviews suggested that relational continuity in inpatient rehabilitation was supported, the CTM final scores did not correlate with relational continuity for patients transitioning from inpatient rehabilitation to home. This calls into question the CTM's ability to capture all relevant facets of transitional care.

Lastly, another important component of care continuity is the ability of health care providers to work well with one another and take a consistent approach to treating a patient. This has been termed management continuity (Haggerty et al., 2003). Although both Freeport and acute care discuss taking a team approach to treating patients, the providers in these two care settings had very different attitudes toward the efficacy and efficiency of this approach. Within acute care, inconsistent staff hindered the discharge planning process and various health care providers seemed to be at odds regarding the timing of discharge and the placement of patients.

Within Freeport's inpatient rehabilitation and complex continuing care units, a much more harmonious team environment was described, indicating once again, that transitional care quality would likely be greater in Freeport compared to acute care.

Overall, these findings in conjunction with the available care transitions literature indicate that transitions from an inpatient rehabilitation unit or complex continuing care unit would be much smoother than transitions from an acute care environment for older MSK patients. For instance, Freeport's health care providers focus on the education of patients and their families, a primary contact facilitates the building of a relationship and rapport between the patient and the health care provider, and the health care providers work well together as a team. These three examples from the health care provider interviews are reflective of the three components of strong care continuity: informational, relational, and management continuity, respectively (Haggerty et al., 2003). Interestingly, the majority of issues elucidated through the key informant interviews cut across each care setting examined. This may indicate that the fundamental elements to ensuring high transition quality from the care providers' perspective are the same in each transition, regardless of the care settings involved. This will be explored in more detail following a discussion of the main findings of relating to the administration of the CTM.

The second component of this study involved assessing the validity of the CTM through both qualitative and quantitative means. Although relatively low levels of agreement were found between administrations for each CTM item, the final CTM score demonstrated acceptable reliability, indicating that the resulting final score is stable with minimal interobserver and intraobserver variability. These seemingly contradictory results between item reliability and

overall reliability may in part be explained by the large proportion of participants responding in agreement rather than disagreement to most statements. Kappa statistics are influenced by this ratio of agreement to non-agreement, resulting in a lower kappa statistic even when agreement is high (Feintsein & Cicchetti, 1990).

Furthermore, qualitative data suggest that participants' motivation behind choosing 'agree' versus 'strongly agree' was generally arbitrary, which would also likely contribute to the CTM displaying only slight or fair inter-rater agreement for most individual items, but moderately high inter-rater reliability for the CTM overall. Also, research conducted by Ross, Steward, and Sinacore (1995) suggest that the five-point Likert agree-disagree response format, similar to the four-point Likert scale used in the CTM, is susceptible to the acquiescent response bias whereas an evaluation response format (e.g., poor, fair, good, very good, excellent) is not. Acquiescence was defined as a propensity to agree with an item irrespective of its content, and was found to be more prevalent among older adults with poor health and low education (Ross et al., 1995). Therefore, further research should examine the utility of an evaluation response format as opposed to the four-point Likert scale to reduce ambiguity and to improve item reliability across different times or with different raters. In addition, some items, for instance, 'When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks', lend themselves to more dichotomous response options (e.g., agree or disagree). Although dichotomous response options are not recommended due to the possibility that information could be lost thereby reducing reliability (Streiner & Norman, 2003), these findings point to the importance of further revising

either the current response options of the CTM or rephrasing the items to better match the prescribed response format.

Due to a paucity of valid performance measurement scales assessing transitional care, global questions were necessarily devised for the present study to test the construct validity of the CTM. Although these global questions had not been previously validated, overall they demonstrated good inter-rater reliability, particularly considering the resulting reliability values were likely attenuated due to the fact that a small sample size was used and each reliability calculation was based on only one item. This degree of unreliability in the global questions likely led to conservative estimates of the CTM's construct validity.

Despite this, two of the four correlations between the global questions and the CTM met the pre-determined level of significance considered to demonstrate adequate validity. The high correlation between the CTM final score and the informational continuity global question was likely due to the high number of items that assess the exchange of information. The global question measuring overall transition quality was most strongly correlated with the CTM final score, suggesting that the CTM is measuring what it purports to measure. Management continuity, although not directly assessed by the CTM, was found to have a correlation approaching the pre-determined level of significance, providing partial support for the construct validity of the CTM. However, it is likely that a direct reflection of issues pertaining to management continuity in the CTM would have generated a higher correlation, in turn improving the measure's construct validity. The lack of relationship between the CTM final score and relational continuity will be discussed below. The final assessment of convergent validity was the association between CTM final score and length of hospitalization. These variables were

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found to be negatively correlated, and this association approached the pre-determined level of significance. Contrastingly, in Coleman and colleagues' study (2005) this relationship was positive. These apparently conflicting results seem reasonable given that the participants in the present study had a longer average hospital stay with greater variance. A longer hospital stay may be indicative of more complex patients, who are therefore at a greater risk of poor transitions. This finding indicates the need for more research to examine the link between length of stay within the hospital and care transitions quality. Lastly, divergent validity of the CTM was determined through the lack of association between CTM final score and age (Morey & Boggs, 2004), which is consistent with the low correlation found by Coleman and colleagues (2005). The relationships between the CTM final score with three of the four global questions, and age support the construct validity of the CTM.

In general, quantitative information obtained through the CTM and the global questions corresponds to the qualitative information provided through participants' spontaneous and unprompted responses, offering support for the validity of the CTM. The average score on the CTM was quite high and the CTM final scores were significantly correlated to the global questions assessing the overall quality of the transition, informational continuity, and to a lesser extent, management continuity. Overall, these quantitative results indicate that most participants experienced a high quality transition.

In conjunction with these results, qualitative data also indicated that most respondents were very positive about their experience at Freeport Health Centre; they were grateful for the time to rehabilitate and regain their independence and appreciated the staff at Freeport Health Centre. Interestingly, this enjoyment of rehabilitation and respect for therapy staff may have

contributed to a social desirability bias, as even when participants could not recall, for example, receiving documents or various medication side effects, they were reticent to disagree. Also, it is unclear whether the CTM was more reflective of their satisfaction with their hospital stay or of their actual transition. Furthermore, some items in the CTM discuss issues of self-care, for instance, understanding how to take medication, and thus participants may have been more inclined to answer those items affirmatively for both self-preservation and for fear of negative repercussions in terms of care. Although interviewers attempted to minimize this potential form of bias by explicitly explaining to the participants that this research was independent of the hospital and that their responses would in no way affect the care that they would receive, this still may have resulted in spuriously higher scores. Therefore, the observed final scores on the CTM may be artificially slightly higher than the true scores.

Although the CTM generally reflected how the participants perceived their transition, respondents also discussed other aspects of transitional care that were not captured by the CTM. Therefore, the qualitative data actually tempers the strong results from the psychometrics of the CTM and calls into question its ability to capture fully transitional care quality for older more at risk patients. The importance of building a relationship and being able to effectively communicate with their health care providers was brought up by many participants. Interestingly, Coleman and his colleagues (2005), the creators of the CTM, considered issues concerning consistent health care providers, effective communication, and the development of a relationship between health care providers and patients important in determining the construct validity of the CTM. However, it is unclear why these constructs were not included in the CTM, other than perhaps to retain the brevity of the instrument. Although the CTM was significantly correlated to

this construct in Coleman and colleagues' study (2005), only a small and insignificant correlation was found between the CTM final score and the global question assessing relational continuity, suggesting that the CTM does not adequately cover this important component of continuity. For older rehabilitation patients whose length of stay in the hospital is on average over two weeks, communication and rapport with health care providers may be more important and therefore the addition of items within this domain should be further explored. Another aspect of transitional care put forth by participants was issues surrounding home care. Almost all respondents in this study received some form of home care, therefore the adequacy of care they received and the rapport they developed with home care providers was an important component of their transitional care. The CTM's strong emphasis on the hospital side of the transition, primarily related to discharge, seems to largely neglect the second half of the transition: aspects concerning care once the patient has transitioned home. Future iterations of the CTM should explore the benefits of including items surrounding home care to adequately capture care transition quality for this population of patients.

Another interesting finding of this study was the relationship between the three and 15 item versions of the CTM. Although these two measures were strongly correlated, the CTM-3 was found to account for 48% of the variance of the CTM-15, which is significantly lower than the 88% of variance accounted for by Parry and colleagues (2008). This suggests that for this particular sample, the additional 12 items within the CTM-15 are very important to adequately assess care transition quality.

A number of items warrant further discussion to elucidate the results and provide suggestions for their improvement. The CTM Item 1, relating to goal setting, was very difficult

for participants to understand and oftentimes required clarification. Therefore, re-wording this item should be considered to facilitate understanding. Alternatively, scripted probes could accompany the item to ensure interviewers are clarifying the statement in a uniform way, while still allowing the participant to interpret the item in a manner that is personally meaningful. Items 7 and 15, which assess the provision of a written care plan and comprehension of possible medication side effects, respectively, were both identified by the CTM as areas of improvement for the health care setting. The qualitative data for both statements support this finding and also suggest that the true average score for these items may actually be lower, as some participants were reluctant to disagree even though their narrative seemed to indicate otherwise. Since the lower score on these items reflects the verbal commentary provided, this variation in the frequency of endorsement suggests that the CTM is able to distinguish low quality aspects of transitional care.

Triangulating the results from the health care provider interviews and the CTM administration serves to support the validity of the CTM, as Freeport Health Centre's discharge planning process consists of the components that comprise strong care continuity and the CTM scores are correspondingly high. However, triangulation of the data also indicates limitations of the CTM. Firstly, the CTM may not be adequately measuring the purported construct. Most participants' comments reflected their appreciation for the opportunity to rehabilitate and regain independence, and their CTM final score reflects this. However, it is unclear whether the final CTM score was more reflective of the quality of their hospital stay or the quality of their transition.

Furthermore, the participants' unprompted narrative also suggests that significant factors relevant to transitional care are not encompassed by the CTM, specifically, the importance of patient-health care provider relationships and the adequacy of home care. The relevance of building rapport with patients was further reflected in the health care provider interviews. Freeport Health Centre has a greater focus on patient and caregiver preparation compared to acute care and had a designated staff member who acts as the primary liaison between the hospital and the patient and their family thus facilitating relational continuity. However, the results from the CTM administration to patients transitioning from Freeport demonstrated a low and insignificant correlation between relational continuity and the CTM final score. These findings suggest that the CTM does not assess or adequately reflect this important aspect of transitional care quality. Furthermore, based on the interviews with health care providers, inclusion of items relating to relational continuity, for instance consistency of staff, would help differentiate transitional care quality in acute care settings from transitional care quality in longer stay hospital units. The lack of items surrounding this domain in particular calls into question the CTM's ability to capture the nuances of transitional care quality for complex patients receiving inpatient rehabilitation.

Another concern with the CTM is its inability to capture the most complex patients. Interviews with health care providers identified patient complexity as a major factor influencing their care trajectory and care planning. Cognitive impairment was mentioned by health care providers as the primary patient characteristic leading to more challenging patient care, and was also one of the principle attributes rendering a large proportion of the patients on the inpatient rehabilitation and complex continuing care units ineligible for the present study. Another factor

influencing study eligibility was the propensity of patients on the complex continuing care unit to transition to long term care facilities. The CTM has not been designed to be administered to patients with cognitive impairment or patients transitioning to care settings with a high level of support. These complex patients are likely at the greatest risk for poor care transitions (Coleman et al., 2004), and based on the health care provider interviews, transitional care quality was the lowest between the hospital and long term care. This speaks to the importance of having a performance measurement scale that can capture transitions for these at risk patients.

Although the quantitative results of this study indicate that the CTM demonstrates excellent psychometric properties, the qualitative data suggest that there may be more fundamental problems with the CTM. Qualitative data indicate that some aspects of care that may have had a significant impact on transitional care quality for this specific population may not have been captured, namely home care quality and communication and rapport with health care providers. Inclusion of these factors may have better captured the nuances expressed by participants and perhaps more adequately reflected care transition quality for this population. Therefore, further research should examine this transition and modifications to the CTM should be considered to ensure all relevant facets of transitional care are captured for the transition from inpatient rehabilitation to home, to facilitate respondents' understanding of the various items, and to help improve the test-retest and inter-rater reliability. Furthermore, due to the small sample size and potential for self-selection bias, it is unclear whether the propensity of participants to agree with the items reflects a positive transition, or a failure of the instrument to discriminate between high and low transition quality from this particular care setting. Due to the preponderance of items assessing hospital care within the CTM, it is also unclear that the CTM is

truly assessing transitional care quality or whether it is in actual fact measuring satisfaction with

hospital care or discharge planning capability. High hospital satisfaction may bias participants to

respond in agreement to a scale assessing transitional care quality, resulting in spuriously high

care transition quality scores. While strong discharge planning has been found to be a component

of a successful transition (McWilliam & Sangster, 1994; Kripalani et al., 2007), transitional care

quality is more than simply the discharge from the hospital; it is a carrying over of information

learned within the hospital, the transfer of accountability from one team of health care providers

to the next, and a set of actions carried out to ensure care coordination from one care setting to

the next. Since transitional care research is still in its infancy, the construct of transitional care

will continue to evolve in light of new findings, and so too will its measurement.

　　　　Based on the qualitative and quantitative information obtained from the CTM

administration to patients and the qualitative interviews with the health care providers, the need

for two different measures to assess transitional care quality is evident: one measure to assess

care transitions from the patient perspective and another to assess care transitions from the health

care provider perspective. Measuring the patient perspective is important to ensure that patients

are both receiving pertinent information regarding their condition and are confident with their

ability to use this information. This is particularly crucial when patients are transitioning to care

settings in which they are relatively autonomous and highly involved with self-care. Although

Coleman and colleagues (2005) pioneered the assessment of care transitions from the patient

perspective, as discussed in Chapter 3, modifications to the response scale, the revision of certain

items, and the addition of important care continuity and home care items should be considered to

better capture the patient perspective from longer stay hospital units, and limit the effects of the

social desirability bias. Future research should focus on piloting these revisions and applying rigorous methods to assess the scale's psychometric properties.

The development of a performance measurement scale that assesses transitional care quality from the perspective of the health care provider should also be considered. Through the qualitative health care provider interviews, it became clear that many of the issues impacting transitional care spanned each care setting examined. Therefore, it would be appropriate to have a single measure that assesses transitional care quality from the health care provider perspective that would apply to the spectrum of possible care transitions. Furthermore, three primary areas emerged that contribute to transitional care and would be valuable to assess: communication between the sending and receiving care settings, communication within the care setting, and communication with the patient and/or their family member. In terms of communication between care settings, health care professionals in each care setting wanted to receive similar information from the previous health care setting. Within the proposed performance scale, this could possibly translate into a check box with a list of relevant informational resources as well as an indication of whether the appropriate information was received. With respect to communication within care settings, utility of current modes of information transfer e.g., bullet rounds, and consistency of the approach to treating patients could be assessed. Lastly, the assessment of communication with patients and/or family caregivers should take into account the degree patients actually understand and can use pertinent information as well as the patients' level of preparedness from the previous care setting.

The development and implementation of a performance measurement scale assessing transitions from the perspective of the health care provider would ensure that transitional care

quality involving even the most complex patients, including those with cognitive impairment, or the least autonomous care settings would be captured. Implementation of this scale would also support standardized transitional care procedures across the spectrum of possible care transitions, which would better ensure that the necessary elements of a high quality transition are present regardless of the care settings involved.

4.2. STRENGTHS AND LIMITATIONS

A primary overarching strength of this research was its use of multiple sources of data. In this study, using both qualitative and quantitative data facilitated a more accurate interpretation of the results. Neglecting to record the participants' unprompted commentary throughout the survey administration would have resulted in a much more rose-coloured interpretation of the CTM's ability to adequately assess transitional care quality for this complex population. Respondents' comments helped elucidate not only their understanding of the items, but also broader issues that impacted their transitional care that were not captured by the CTM. Consistent with research using quantitative and qualitative methodology to examine complex phenomena, the culmination of these methods resulted in a more comprehensive understanding of transitional care for older persons with MSK disorders (Johnson & Onwuegbuzie, 2004). Although this is relatively preliminary research, the chosen study design ultimately helped enhance this study's contribution to the literature.

An additional strength of this research was the examination of transitional care from multiple perspectives. The patient perspective provided insight regarding the utility of the CTM as well as challenges and facilitators of transitional care. As discussed by Coleman and colleagues (2003), the patient perspective is important to ascertain as patients and their caregiver

are often the only source of continuity throughout care transitions. Exploring transitional care from the health care provider perspective was also important as it enabled the elucidation of common elements and issues surrounding care transitions from a range of health professionals across multiple care settings. In addition, it helped to show that transitional care is not consistent across care settings and yet the components of a positive transition from the perspective of a health care provider generally are. The combination of the patient and care provider perspectives provided a more complete understanding of the assessment of transitional care, and allowed more pragmatic and thoughtful conclusions to be drawn.

This study also contributes to the dearth of research in the field of transitional care (Coleman, 2003), particularly with regards to the utility of the CTM. Despite its widespread use, more rigorous testing of the CTM within a highly complex, and thus more at risk patient population was needed. As evidenced in Table 1, the present study used a more complex patient population than that in which the CTM was originally validated. This research helps identify the capacity and limitations of the CTM, and provides suggestions for its improvement. Furthermore, the present study will stimulate additional, and much needed research to be performed within this intricate field and underlines the need for ascertaining the psychometric properties of the CTM with different subpopulations.

Although the research offers a valuable contribution to the transitional care literature, there are also some limitations of the overall study. One limitation stems from the population examined. Both the health care provider and patient based components of this research examined transitional care for older MSK patients. MSK patients are a complex patient population who are likely to receive care from multiple health care providers across multiple care settings; they are

therefore at a greater risk of poor transitions and thus a very important population for studies of transitional care. However, MSK patients who have been admitted to inpatient rehabilitation are already a select group based on their rehabilitation potential, and MSK patients with a different care trajectory may not have the same care transition experience. Therefore, the results from this research are only generalizable to older MSK patients who received inpatient rehabilitation, then transitioned home.

Results from this study should be cautiously interpreted in light of the methodological challenges experienced. Recruiting older adults into research studies has been cited in the literature as challenging both in terms of achieving an adequate sample size and obtaining a representative sample of the broader population (Uman & Urman, 1990; Bowsher, Bramlett, Burnside, & Gueldner, 1993; Gueldner & Hanner 1989; Carter et al. 1991). Both of these challenges were experienced within this study. Although at the outset of the study, seasoned, knowledgeable health care professionals provided assurance that participants could easily be recruited, persistent recruitment challenges were experienced and it was difficult to attain a large sample.

It is also likely that the study sample was impacted by a self-selection bias, resulting in a healthier and less complex patient sample than the general population of inpatient rehabilitation patients. Based on reports from the health care providers primarily involved in recruitment, the patients who decided not to be contacted were more likely to be medically complex, dissatisfied, more stressed and have poorer coping skills compared to those who did decide to be contacted. These patient-centred recruitment challenges are well supported in the literature (Ives, Kuller, Schulz, Traven, & Lave, 1992; McNeely & Clements, 1994; Mody et al., 2008). A number of

other factors also likely contributed to the enrolment difficulties within this study, including older adults' suspicions about research studies based on feelings of vulnerability or life experiences, apprehension about signing forms, hearing or visual deficits, fear their privacy would be compromised, fear there would be negative repercussions of participation (e.g., eviction from housing), and concern that the research project would be too difficult to understand (Kelsey, O'Brien, & Grisso, 1989; Mody et al., 2008). These issues likely played a role in eligible patients' final decision to participate in the study.

However, a number of patients on both participating units were not even eligible to participate, primarily due to cognitive impairment. This also contributed to the overall healthier cohort within this sample than the general inpatient rehabilitation population as well as the lower recruitment numbers. Although the sample population studied was less complex than the general inpatient rehabilitation or complex continuing care population, it was more complex than any other used to validate the CTM. Since older more complex patients are at a greater risk for experiencing poor transitions, this study helps elucidate salient difficulties with transitional care for these at risk patients.

Another challenge, particularly on the complex continuing care unit, was that a large proportion of patients were not transitioning home, but rather to long-term care, contributing to a low number of eligible participants from that unit. Future research should examine whether the CTM can adequately capture care transition quality for patients transitioning to long-term care and other care settings where the patient is less autonomous in terms of self-care or if an alternative scale should be designed, for those purposes.

The primary limitation of the present study stems from the inherent complexity of care transitions research. Transitional care can involve multiple stakeholders, including the patient, their caregiver or family members, and various health care professionals, in addition to spanning multiple health care settings. Furthermore, one patient can undergo several different transitions. Logistical considerations limited the research to focus on the in-depth examination of only one transition point from multiple perspectives, the transition from inpatient rehabilitation to home. Although this offers a significant contribution to the current literature as there is no research examining transitional care from inpatient rehabilitation units, it still only provides one piece of the transitional care puzzle. Therefore, future research should attempt to examine multiple transitions spanning a variety of care settings. Administration of the CTM to patients undergoing these varying transitions may serve to further elucidate its capacity to assess transitional care across different transition points and for a range of patient populations.

4.3. CONCLUSIONS

Using a quantitative performance measurement scale like the CTM can identify specific aspects of care transitions that are in need of improvement. Having a reliable and valid measure is a pertinent first step to identifying areas that could be modified and improved. This research makes suggestions to advance the utility and validity of the CTM, as well as to develop a separate performance measurement scale to evaluate transitional care from the perspective of the health care providers. The results of this research could assist with the continual evaluation and development of the current care system, specifically as it relates to protocols for transitions. This research is timely, as programs recently put in place to facilitate care transitions, for instance the Home at Last programs in Ontario, are in need of evaluation. Use of a valid performance

measurement scale could help evaluate these programs to ensure outcomes are maximized for the

health care system and for older adults. Through the translation of this research into practice, the

health and well-being of older adults can be improved and some of the factors that impede their

recovery process (e.g., medication errors, hospital readmission, and inadequate patient discharge

forms; Moore et al., 2003; Coleman, 2003; Forster et al., 2003; Kripalani et al., 2007) could be

removed or attenuated. Results from this study could potentially be extended to other similar

patient populations, as care transitions are common and the improvement of any problem areas

identified would likely improve transitions across the spectrum of care settings and for a range of

patient types.

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APPENDIX A

<div align="center">**CARE TRANSITIONS MEASURE (CTM-15)**</div>

Patient Name: _____   Date: _____

<div align="center">Who completed interview? θ Patient θ Caregiver</div>

The first few statements are about the time you were in the hospital . . .

---

1. Before I left the hospital, the staff and I agreed about clear health goals for me and how these would be reached.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

2. The hospital staff took my preferences and those of my family or caregiver into account in deciding *what* my health care needs would be when I left the hospital.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

3. The hospital staff took my preferences and those of my family or caregiver into account in deciding *where* my health care needs would be met when I left the hospital.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

The next set of statements is about when you were preparing to leave the hospital . . .

---

4. When I left the hospital, I had all the information I needed to be able to take care of myself.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

5. When I left the hospital, I clearly understood how to manage my health.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

6. When I left the hospital, I clearly understood the warning signs and symptoms I should watch for to monitor my health condition.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

7. When I left the hospital, I had a readable and easily understood written plan that described how all of my health care needs were going to be met.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

8. When I left the hospital, I had a good understanding of my health condition and what makes it better or worse.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

9. When I left the hospital, I had a good understanding of the things I was responsible for in managing my health.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

10. When I left the hospital, I was confident that I knew what to do to manage my health.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

11. When I left the hospital, I was confident I could actually do the things I needed to do to take care of my health.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

The next statement is about your follow-up doctors' appointments . . .

12. When I left the hospital, I had a readable and easily understood written list of the appointments or tests I needed to complete within the next several weeks.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

The next set of statements is about your medications…

13. When I left the hospital, I clearly understood the *purpose* for taking each of my medications.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

14. When I left the hospital, I clearly understood *how* to take each of my medications, including how much I should take and when.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

15. When I left the hospital, I clearly understood the possible *side effects* of each of my medications.

Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**	**Don't Know/ Don't Remember/ Not Applicable**

Scoring the CTM-15

Overall Quality of Care Transition Score: This score reflects the overall quality of the care transition, with lower scores indicating a poorer quality transition, and higher scores indicating a better transition.

Scoring Protocol

Step 1:   Code responses as Strongly Disagree =1; Disagree =2; Agree =3; Strongly Agree =4.

Step 2:   Assign code (e.g., 9) to missing responses, and a different code (e.g., 99) to Don't Know/Don't Remember/Not Applicable. These will not be counted as answered questions for Step 3a, as the 9 and 99 codes are not included in the 4 point Likert scale and therefore will not contribute to the CTM score. You can, however, get a count of 99's in order to calculate a percentage of these responses relative to questions answered (step 3a.)

Step 3:   Compute a mean score for each respondent based only on the questions answered. To do this:

- Step 3a: For each respondent count the number of questions answered. (In SPSS, Step 3a is accomplished with the Count command in the Transform menu and Step 3b by a Compute command).

- Step 3b: For each respondent obtain a summated score by adding Step 1 values across answered questions.

- Step 3c: Obtain **mean** for each respondent by dividing Step 3b result by Step 3a result. The name of this value is **mean**.

Step 4:   Perform a linear transformation of the result of Step 3c to obtain a user-friendly 0-100 score. Use the following formula:

- 0-100 CTM Score for each respondent = [(Step 3c result-1)/3]*100 .

- In SPSS Syntax this computation is:
  ```
  COMPUTE CTM15_0_100 = (((ctm15)-(1))/(3))*100 .
  EXECUTE .
  ```

APPENDIX B

Instructions for Freeport Health Centre Rehabilitation Contact

Thank you for facilitating the recruitment of potential participants for our study. Your help is greatly appreciated. Please follow the steps outlined below for each patient with a musculoskeletal disorder in your care that is:

- 60 years or older
- Speaks English
- Not aphasic
- Without severe cognitive impairment (must be able to answer questions on his/her own)
- Transitioning from Inpatient Rehabilitation or Functional Enhancement Unit to home (with or without home care, but not a nursing home or long term care home).

1. Please provide these patients with the brochure entitled "information for patients," along with one consent form for the patient outlining whether we are able to contact him/her. Obtain family/friend care giver contact information (via care giver consent form) only if it is not known where the patient's next place of care will be.

2. Explain that a group of researchers from the University of Waterloo are performing a study that looks at the quality of care transitions for people that have a musculoskeletal disorder.

3. Allow the patient some time to think about his/her potential participation in the study.

4. Return to collect consent forms at your next visit to the patient (ideally within 24 hours).

5. Forward interested participant contact information to:

> Brandie Steeves
> Senior Project Manager
> basteeve.uwaterloo.ca
> Tel: 519-888-4567 x 37054
> Fax: 519-888-4362

If you have any questions or concerns regarding this study, please contact Brandie Steeves, Senior Project Manager, at 519-888-4567 x 37054.

APPENDIX C

Who are we?

InfoRehab is a group of researchers and health care providers from many different backgrounds who all share the goal of understanding the care of people who have musculoskeletal disorders.
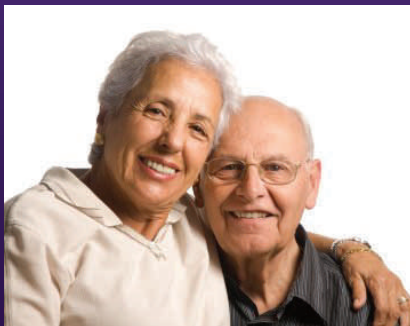
This study is being conducted by Paul Stolee, PhD, from the University of Waterloo. This study is funded by the Canadian Institutes of Health Research. This project was reviewed by, and received ethics clearance through the Office of Research Ethics at the University of Waterloo and the Tri-Hospital Research Ethics Board.

For general inquiries, questions about ethics or privacy contact:

Brandie Steeves
Senior Project Manager
University of Waterloo
Phone: 519-888-4567 ext. 37054
E-mail: basteeve@uwaterloo.ca

Study on Care Transitions:

Information for Study Participants

Improving Care for People with Musculoskeletal Disorders

WHAT DO WE KNOW?

Moving from one care setting (e.g. a hospital) to another (e.g. home) can be hard. Many things can affect this move, which can also affect the recovery process.

WHAT WE WOULD LIKE TO FIND OUT

- The quality of your care transition (process of moving from one care setting to the next)

- Determine whether the Care Transitions Measure (CTM) is a suitable survey for measuring the quality of care transitions for patients with musculoskeletal (MSK) disorders

- An overall picture of care co-ordination and information sharing for MSK patients

WHAT CAN YOU DO TO HELP?

FILL OUT THE CARE TRANSITIONS MEASURE (CTM)

A quick 15 question survey that looks at the overall quality of your move from the hospital to your home. We will also ask 4 questions to determine your overall satisfaction with different aspects of your move . You may also be asked to complete the survey again, or to talk more in-depth about your move, however you can refuse to participate in any aspect of the study at any time.

WHERE?
By telephone

HOW LONG?
Approximately 25 minutes

All information you share with us will remain anonymous and confidential.

Your help with this study would be greatly appreciated!

HOW CAN I PARTICIPATE?

All you have to do is fill out the attached forms with your contact information. A student researcher from the University of Waterloo will contact you 3-4 weeks after your move from one care setting (e.g., inpatient rehabilitation) to the next (e.g., home).

WHAT WILL HAPPEN WITH MY INFORMATION?

Your information will help provide us with an in-depth look at the quality of care transitions. This information will help us understand how to improve the care for people who have a musculoskeletal disorders.

inforehab
TRANSITIONS

APPENDIX D

InfoRehab: Improving Care Transitions for Patients with Musculoskeletal Disorders

Study Participant Information Letter

Contacts:
Principal Investigator: Paul Stolee, PhD; stolee@uwaterloo.ca; 519-888-4567 x35879
Project Manager: Brandie Steeves; basteeve@uwaterloo.ca; 519-888-4567 x37054

What is the purpose of this study?
Going through a transition, or a move, from one care setting (e.g., a hospital) to another (e.g., home) can be difficult and many different things can affect the quality of this transition. The purpose of this study is to test a certain scale, the *Care Transitions Measure*, and its ability to measure the quality of moves from hospital to home among older individuals who have a musculoskeletal disorder. This study will help us answer important questions about the quality of care transitions for older patients moving from rehabilitation within the hospital to home.

Who can participate?
We are looking for senior patients (ages 60 and older) who have a musculoskeletal disorder and are currently in an inpatient rehabilitation setting within Freeport Health Centre and moving home.

What will I be asked to do?
We are asking people who will be moving from the hospital (e.g. an inpatient rehabilitation unit) to home (e.g., home with or without home care) to fill out a 15-item questionnaire, the *Care Transitions Measure.* This will take place over the telephone within 3-5 weeks after you have been discharged from the hospital. We will also ask you three questions to determine your overall satisfaction with different aspects of your move from the hospital to your home. This information is important as it will allow us to identify areas that need to be changed in order to improve the rehabilitation of people who have a musculoskeletal disorder. When you have completed this part of the study, you may be asked to either complete the questionnaire again at a later date, or participate in an in-depth conversation about your transition. You can refuse to participate in any part of the study at any time. A decision to participate or not in this study will have no impact on the care you receive now at Freeport Hospital or in the future.

We would also like to look at your health record in order to gather information, for instance your functional ability pre and post rehabilitation, medication use, health conditions/comorbidities and other general descriptive information including your age, gender, and whether you live with a caregiver. No personally identifying information will

be attached to your file, so all information we get from your health record will be recorded anonymously.

If you decide to participate, a research assistant from the University of Waterloo will set up a time that is convenient for you to come by and have a conversation about the study and answer any questions you may have.

Where will the study take place?
The study will take place after you have moved back home, and it will be over the telephone. If you are asked to participate in a more in-depth conversation about your move and decide to do so, this would take place in your home or if you would prefer, a private room at the University of Waterloo could also be provided. However, if you are asked, you can always refuse to participate in that portion of the study.

How long will the study take?
The telephone survey will take approximately 25 minutes to complete. If you agree later to participate in the in-depth interview, it will take approximately an hour to complete.

Can I change my mind about participating in the study?
You may decline to answer any questions, or withdraw from the study at any time. Withdrawal from the study will not affect any of the services or care you receive in any way. If you wish to withdraw from the study, you can let the interviewer know any time during the interview, or you can call Brandie Steeves at 519-888-4567 x37054 and let her know. At that time, you can decide whether you would like us to keep any data you have provided or we can destroy all data relating to your study participation.

Are there any risks or benefits involved in participating in this study?

There are no risks or benefits for you related to participating in this study. However, some participants may find discussing their move from hospital to home distressing. If this occurs for you, please let the researcher know and the survey or interview can be stopped or paused.

Will I be audio recorded during the study?
The telephone survey will not be audio recorded. If you are asked to complete the in-depth interview and decide to do so, your answers to the interview will be audio recorded and entered into a secure computer database.

Will any remuneration be provided for my participation in the study?
You will not receive remuneration for your participation in the study.

Confidentiality and Security of Data

The information you provide will be kept confidential and identified by number only. Your name will not appear in any report or publication resulting from this study. Any quotations used in reports from your interview will be referenced as anonymous.

You have the right to ask the researchers about the data being collected about you for the study and about the purpose of these data. You also have the right to ask the researchers to let you see your personal information and make any necessary corrections to it.

Data collected will be kept securely stored in a locked office for a period of 5 years, and then confidentially destroyed. The answers to the interview will be stored in a locked file cabinet, in a locked office, at the University of Waterloo for a period of 5 years. Patient health records and documents will be inspected, copied without patient identifiers and removed by research staff. Electronic files, with no personal identifying information, will be stored on a secure, password protected computer at the University of Waterloo for a period of 5 years. After 5 years, any written notes from the interview will be confidentially shredded and electronic files will be destroyed. Only members of the research team and the Tri-Hospital Research Ethics Board, who have signed a confidentiality agreement regarding information collected during the study, will have access to the study data.

Who can I contact if I have any questions?

If you have any questions regarding the research itself, please contact either Paul Stolee PhD, Principal Investigator, at 519-888-4567 ext. 35879, or Brandie Steeves, Senior Project Manager, at 519-888-4567, ext. 37054.

This project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. The final decision to participate is yours. Should you have any comments or concerns resulting from your participation in this study, please contact Susan Sykes, Director, Office of Research Ethics, University of Waterloo at 519-888-4567 ext. 36005. This project was also reviewed and approved by the Tri-Hospital Research Ethics Board. You may also contact Dr. Michael Coughlin the chair of this ethics review panel, at 519-749-4300 x5367, if you have any questions or concerns.

APPENDIX E

InfoRehab: Improving Care for Patients with Musculoskeletal (MSK) Disorders

Study Participant Permission to be Contacted Form for Care Transitions Measure study

Contact:

Principal Investigator: Paul Stolee, PhD; stolee@uwaterloo.ca; 519-888-4567 x35879
Project Manager: Brandie Steeves; basteeve@uwaterloo.ca; 519-888-4567 x37054

I have read the information in the brochure about this study being conducted by Paul Stolee PhD, at the University of Waterloo.

I am interested in participating in this study that examines care transitions for patients with musculoskeletal disorders. I have received the information letter about the study to test a short questionnaire that assesses the quality of care transitions. I was informed that you would like my help to test the Care Transitions Measure's ability to assess the quality of patients' moves from inpatient rehabilitation settings to home. I also understand that you would like to review specific information from my health records and that all information gathered will be anonymous.

I have given my permission for a Research Assistant to contact me by phone once he/she receives this Permission to be Contacted Form. I was informed that I will be given more information about the study and I can decide whether or not to participate without any consequences to the health care I am presently receiving or will receive in the future. I was also informed that the researchers at the University of Waterloo will not know if I decide not to be contacted.

I was informed that this project has been reviewed and given ethics clearance by the Office of Research Ethics at the University of Waterloo and the Tri-Hospital Research Ethics Board. If I have any comments or concerns resulting from my involvement in this study I may contact Susan Sykes, Director of the Office of Research Ethics at the University of Waterloo at 519-888-4567 x36005. I may also contact Michael Coughlin, Chair of the Tri-Hospital Research Ethics Board at 519-749-4300 x7348.

Please complete the information below. Your health care provider will forward this form to the research office in Waterloo.

1. Your Name (please print):

_____

2. Telephone Number:

HOME:

_____

WORK:

_____

CELL:

_____

3. Are you available:
(Check all that apply)

☐ Morning   ☐ Afternoon   ☐ Evening

4. *Weekdays or Weekends:*
(Check all that apply)

☐ Weekday   ☐ Weekend

5. Can we leave a message: ☐ YES   ☐ NO

Signature of participant: _____Date: _____

Witness: _____ Date: _____

APPENDIX F

InfoRehab: Improving Care for
Patients with Musculoskeletal Disorders

Participant Consent Form

Contact:

Principal Investigator: Paul Stolee, PhD; stolee@uwaterloo.ca; 519-888-4567 x35879
Project Manager: Brandie Steeves; basteeve@uwaterloo.ca; 519-888-4567 x37054

I have read the information letter about the study to test a short questionnaire that measures the quality of care transitions. I have been informed that you would like my help to understand the quality of my move from hospital to home. I know that this study is being conducted by Paul Stolee, PhD at the University of Waterloo. I have been informed that my participation in this study involves one, 25 minute session three to four weeks after I have moved from the hospital to home. I have been informed that I may be asked to participate in another part of the study, which would involve either completing the telephone survey again or participating in an in-depth, face to face conversation about my move. I was also informed that I can refuse to participate in any portion of this study at any time.

I have had the chance to ask questions related to this study. I have had the chance to receive satisfactory answers to my questions and any additional details I wanted. I have been informed that I am free to withdraw from the study at any time by telling the researchers that I no longer wish to continue. I know that if I change my mind about participating there will be no penalty.

I have been informed that as part of this study Paul Stolee, PhD and other investigators would like to review my medical history by using my chart held at Freeport Health Centre to gather some general information about my functional ability before and after rehabilitation, medication use, health conditions and other general descriptive information including my age, gender, and whether I live with a caregiver. I have been informed that no information obtained from my chart will contain personal identifiers; however it will have an identification number that is linked to other information pertaining to me without personal identifiers. I have been informed that this information will be retained in the strictest confidence and that I may withdraw my consent at any time. If I withdraw my consent to participate in the study after my records have been reviewed, the information copied from my medical history for use in this study will be destroyed.

I have been informed that this project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo and the Tri-Hospital Research Ethics Board. If I have any comments or concerns resulting from my involvement in this study I may contact Susan Sykes, Director, Office of Research Ethics at the University of Waterloo, at 519-888-4567 x36005. I may also contact Michael Coughlin, Chair, Tri-Hospital Research Ethics Board, at 519-749-4300 x5367.

☐ I agree to be contacted about additional studies in the future, at which point I can decide whether or not I would like to participate in those studies.

Patient Name:_____

Patient Signature:_____

Witness Signature:_____

Date:_____

APPENDIX G

Global Validation Questions Based on Three Types of Continuity (Haggerty et al., 2003)

Please rate the following statements on a scale of 1-10. 1 meaning that you do not agree with the statement at all. 10 meaning that you fully agree with the statement.

1. Overall, I was given the information I needed during my move from Freeport Health Centre to home.

2. Overall, the different care providers worked well with each other to manage my care as I moved from Freeport Health Centre to home.

3. Overall, the health providers involved in my move from Freeport Health Centre to home took the time to develop a relationship with me.

Global Validation Question

Overall, on a scale of 1-10, how would you rate the quality of your move from hospital to home? 1 means that you feel the quality of your move from Freeport Health Centre to home was very poor. 10 means that you feel the quality of your move was very good.

APPENDIX H

Medical Record Abstraction Form

Data Item Field	Data Entry Field
1. Identification Number	_ _ _ _
2. Age	_ _
3. Year of Birth (yyyy)	_ _ _ _
4. Gender 1=F, 2=M	_
5. Surgical Date (mm/dd/yy)	_ _ / _ _ / _ _
6. Type of Surgery	
7. Date Admitted (mm/dd/yy)	_ _ / _ _ / _ _
8. Pre-hospital Living Arrangements 1= Living with spouse/partner 2= Living with family (includes extended) 3= Living with non-family, unpaid (includes friends) 4=Living with paid attendant 5= Living alone 6= Living in facility (includes all levels of care except acute) 7= Other 8= Not available	_
9. Pre- hospital Living Setting 1= Home (private house or apartment) without health service 2= Home (private house or apartment) with paid health services (e.g., home care/support; private or public funded) 3= Boarding house (includes rented room) 4=Assisted living (includes group home, retirement home, supervised living setting) 5= Residential care (LTC, convalescent care, nursing home, home for the aged) 6= Shelter (includes night shelter, refuges, hostels for homeless) 7= Public space 8= Other 9=Not available	_
10. FIM Motor Admission Total (13-91 points) Scoring for FIM: 7 = Complete Independence 6= Modified Independence *Modified Dependence* 5=Supervision 4= Minimal Assistance (Subject = 75% +) 3= Moderate Assistance (Subject = 50% +) *Complete Dependence* 2= Maximal Assistance (Subject = 25% +) 1= Total Assistance (Subject = 0% +)	_ _

EATING – FIM – (1-7)	_
GROOMING- FIM– (1-7)	_
BATHING- FIM– (1-7)	_
DRESSING – upper body – FIM– (1-7)	_
DRESSING – lower body – FIM– (1-7)	_
TOILETING – FIM– (1-7)	_
BLADDER MGMT - FIM– (1-7)	_
BOWEL MGMT – FIM– (1-7)	_
TRANSFERS: bed, chair, wheel chair – FIM– (1-7)	_
TRANSFERS: toilet – FIM– (1-7)	_
TRANSFERS: tub or shower – FIM– (1-7)	_
LOCOMOTION MODE: Walk = 1, Wheelchair = 2, or Both = 3 LOCOMOTION SCORE - FIM– (1-7)	_ _
LOCOMOTION: stairs - FIM– (1-7)	_
11. FIM Cognitive Admission Total (5-35 points)	_ _
Comprehension - FIM– (1-7)	_
Expression - FIM– (1-7)	_
Social interaction - FIM– (1-7)	_
Problem Solving - FIM– (1-7)	_
Memory - FIM– (1-7)	_
12. a) Cognitive Impairment Scores 1=Intact Could be MOCA or MMSE MMSE - 24-30 – no cognitive impairment 18-23 – mild cognitive impairment 0-17 – severe cognitive impairment	
12.b) FIM cognitive section total	_ _
12. c) Qualitative Expert Clinical Opinion (health care professional's notes)	
13. Date Discharged (mm/dd/yy)	_ _/_ _/_ _
14. Post-hospital Living Arrangements 1= Living with spouse/partner 2= Living with family (includes extended) 3= Living with non-family, unpaid (includes friends) 4=Living with paid attendant 5= Living alone 6= Living in facility (includes all levels of care except acute) 7= Other 8= Not available	_

15. Post-hospital formal support received 1=Not required 2=Received 3=Received with restrictions 4=Not received	_
16. FIM Motor Discharge Total (13-91 points) Scoring for FIM: 7 = Complete Independence 6= Modified Independence *Modified Dependence* 5=Supervision 4= Minimal Assistance (Subject = 75% +) 3= Moderate Assistance (Subject = 50% +) *Complete Dependence* 2= Maximal Assistance (Subject = 25% +) 1= Total Assistance (Subject = 0% +)	_ _
EATING – FIM – (1-7)	_
GROOMING- FIM– (1-7)	_
BATHING- FIM– (1-7)	_
DRESSING – upper body – FIM– (1-7)	_
DRESSING – lower body – FIM– (1-7)	_
TOILETING – FIM– (1-7)	_
BLADDER MGMT - FIM– (1-7)	_
BOWEL MGMT – FIM– (1-7)	_
TRANSFERS: bed, chair, wheel chair – FIM– (1-7)	_
TRANSFERS: toilet – FIM– (1-7)	_
TRANSFERS: tub or shower – FIM– (1-7)	_
LOCOMOTION MODE: walk = 1, wheelchair = 2 or both = 3 LOCOMOTION SCORE – FIM – (1-7)	_ _
LOCOMOTION: stairs - FIM– (1-7)	_
17. FIM Cognitive Admission Total (5-35 points)	_ _
Comprehension - FIM– (1-7)	_
Expression - FIM– (1-7)	_
Social interaction - FIM– (1-7)	_
Problem Solving - FIM– (1-7)	_
Memory - FIM– (1-7)	_
General Health Information	
18. Pre-morbid locomotion *(if this information cannot be found in chart, ask as a qualitative item)*	
19. Most responsible health condition	

20. Comorbid health conditions – *list*	
Number of medications at discharge	_ _

APPENDIX I

Telephone Script for Administration of CTM and Recruitment for Second Administration of CTM

Hello my name is _____. I am calling from the University of Waterloo about the care transitions study you decided to participate in. Is this an OK time for us to start going through the telephone survey with you? (*If not, reschedule*).

Before we begin, we would like to re-emphasize that you can stop going through the survey at any point in time and this will not affect the care or services you receive in any way.

First question, do you currently receive home care?
(**Probe – e.g., someone who comes in to help with bathing, cleaning, physiotherapy*)

Instructions to interviewer: Go through the Care Transitions Measure in its entirety, then proceed to ask the 4 global validation questions.

Thank you very much for your participation in this study, your help is greatly appreciated!

We are wondering if you would like to participate in the second part of this study, which would involve going through the same questions I asked you today in approximately a week. You are under no obligation to do so. Would you be interested in participating in the second part of the study?

**If No, thank them once again for all of their help.
**If Yes, proceed to set up a date and time to complete the second part of the study within the next 6-10 days.

APPENDIX J

INTERVIEW GUIDE FOR KEY INFORMANT INTERVIEWS

General Background Information

1) Please describe your position here?

> *Probe* Around specific role during patient transition points, such as admission and discharge; or information collection/transfer while the patient is on the unit

Admission

2) Please walk me through the steps related to the process of admitting a person to this unit.

> *Probe* What is your role in this process?
>
> Who else is involved?
>
> How are they involved?
>
> Is this process different depending on what care setting the patient is being admitted from (eg. acute care, long term care, home care, etc.)?

3) What information is generally received from the previous setting (unit)?

> *Probe* Who is responsible for sending the information to this unit?
> Who is responsible for receiving this information?
> How is this information received? (probe: electronic records, forms, informal communication with health care providers, formal communication or meetings, family caregivers, key person, telephone calls etc.)
> Can we have a blank copy of these forms?

4) If our goal is to learn about admission to this setting what should we observe?

> *Probe* For details; eg: place, time, who, for a specific patient, logistics

On the unit

5) What are the characteristics of a typical hip fracture patient in this care setting?

> *Probe* For different groups or types of patients; eg. caregiver vs no-caregiver, gender, age, comorbidities
>
> Are there any challenges we might encounter working with this patient population?
> (eg. communication, cognition)

6) What information is collected once the patient is on this unit?

    Probe Who collects this information?

        How is this information collected? (probe: electronic records, forms, informal communication with health care providers, formal communication or meetings, family caregivers, key person, telephone calls etc.)

        Can we have a blank copy of these forms?

        Who is this information collected from? (probe: patient, family, care provider, observation)

7) What information is given to clients/family caregivers?

    Probe When they arrive on this unit?

        When they are discharged from the unit?

        Who provides this information?

        How is this information provided? (probe: handouts, around meetings they may have with clinicians, etc)

        Can we have a black copy of this form?

<u>Discharge</u>

8) Please walk me through the steps related to the process of discharging a person from the unit.

    Probe What is your role in this process?

        Who else is involved?

        How are they involved?

        What are the most common places patients are discharged to?

        Is this process different depending on what care setting the patient is being discharged to (eg. acute care, long term care, home care, etc.)

        How? For what specific patient types? (eg. frail, without a caregiver)

What steps are taken to prepare clients for discharge? For example, what information is given to clients before they leave? When? How

9) What information is generally sent to the next setting (unit)?

Probe Who is responsible for sending this information? (Note: Information that helps someone plan/follow up care – given to either the patient or caregiver, for instance, what is on a discharge plan)
How is this information sent? (probe: electronic records, forms, informal communication with health care providers, formal communication or meetings, family caregivers, keyperson, telephone calls etc.)
Can we have a blank copy of these forms?

10) If our goal is to learn about discharge from this setting what should we observe?

Probe For details; eg: place, time, who, for a specific patient, logistics

Concluding questions

11) Is there anything else that you feel is important for us to know about the flow of information for patients?

12) What would you want to know with regards to information sharing during transitions?

Probe Format

13) If we only interview two more people on this unit regarding hip fracture patients and the flow of information, who should they be?

Probe Contact information

Around specific role during patient transition points, such as admission and discharge; or information collection/transfer while the patient is on the unit

APPENDIX K

Appendix K: Master table used to determine sample size

| | | | | 5% Level, Two-Tailed Test Continued | | | | | | | |
| | | | | | POWER | | | | | | |
Δ	99	95	90	80	70	60	50	40	30	20	10
0.22	369	261	212	158	125	99	78	60	43	27	11
0.24	308	218	177	133	105	83	66	50	36	23	10
0.26	261	185	150	112	89	71	56	43	31	20	.
0.28	223	159	128	96	76	61	48	37	27	17	.
0.30	193	137	111	83	66	53	42	32	23	15	.
0.32	169	120	97	73	58	46	36	28	21	13	.
0.34	148	105	85	64	51	41	32	25	18	12	.
0.36	131	93	75	57	45	36	29	22	16	11	.
0.38	116	83	67	51	40	32	26	20	15	10	.
0.40	104	74	60	45	36	29	23	18	13	.	.
0.45	80	57	46	35	28	22	18	14	11	.	.
0.50	62	45	36	27	22	18	14	11	.	.	.
0.55	50	35	29	22	18	14	12	.	.	.	.
0.60	40	29	23	18	14	12	10	.	.	.	.
0.65	32	23	19	15	12	10	.	.	.	.	.
0.70	26	19	15	12	10	.	.	.	.	.	.
0.75	21	15	13	10	.	.	.	.	.	.	.
0.80	17	12	10	.	.	.	.	.	.	.	.
0.85	13	10	.	.	.	.	.	.	.	.	.
0.90	10	.	.	.	.	.	.	.	.	.	.

From: Kraemer, H. C. & Thiemann, S. (1987). How many subjects? Statistical power in research. Newbury Park: Sage Publications.