Integrated Care for Older Adults

Transitioning Between Hospital and the Community

by

Cara Liane Brown

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Community Health Sciences
University of Manitoba
Winnipeg, Manitoba

Abstract

Statement of the problem: Hospital to community transitions for older adults are associated with poor outcomes. *Integrated care* is a health care approach with the potential to reduce and/or ease these transitions, but there is little empirical evidence on the topic. The objectives of this thesis were to: 1) systematically examine existing literature on this topic; 2) characterize older adults who would most benefit from integrated care to support care transitions; and, 3) explore the feasibility of indicators to measure clinical integrated care delivery for care transitions.

Methods: Objective 1 was achieved with a scoping review. Objectives 2 and 3 were addressed with a retrospective chart review; data were extracted from 214 hospital medical records. For objective 2, personal characteristics were examined in relation to three outcomes representing potentially avoidable health care using multivariate logistic regression. For objective 3, literature on the elements of integrated care was used to develop clinical indicators. Reliable indicators were further explored at an individual and ward level using descriptive and inferential statistics.

Results: The scoping review indicated that there has been little systematic measurement of integrated care. The findings from objective 2 highlighted the population most at risk of institutional use that could be targeted by integrated care initiatives: those with both mental and physical health impairments. Work from objective 3 resulted in 28 clinical integrated care indicators grouped in 4 domains. In the study context, application of integrated care was variable between indicators, as well as at the individual and ward level.

Discussion: This thesis unites three linked bodies of work that contribute to the advancement of knowledge on integrated care for care transitions. It provides: directions for future research through identification of gaps in the literature; identification of populations to target with integrated care; and a framework and indicators for assessing the level of integrated care being applied at the individual level.

Conclusion: This work provides an important knowledge base to understand care transitions through the lens of integrated care for researchers and policymakers seeking to improve the quality of care transitions for older adults with complex care needs.

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Dedication

For Patrick.

You’ve taught me dedication, perseverance, and discipline.

With the authority of someone who knows how much work it is to complete a doctoral degree; I hereby award you an honorary Ph.D. in triathlon.

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Preface

This work is an original intellectual product of the author, Cara L. Brown. Chapters 3 and 5 have been published in peer-reviewed journals (and a version of Chapter 7 has been submitted for publication). I led these publications as first author and the details of author contributions is listed below.

Contributions of authors.

Chapter 3 has been published as Brown, C.L. & Menec, V. (2018a). Integrated care approaches used for transitions from hospital to community care for older adults: A scoping review. *Canadian Journal on Aging*. First View http://dx.doi.org/10.1017/S0714980818000065. Cara Brown was responsible for the conception, design, development and management of the study, conducting the analysis and interpretation of the data, writing and revising the manuscript. Verena Menec contributed to the conception, analysis, interpretation, and provided feedback on manuscript drafts.

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Submission is planned for a version of Chapter 7 to the International Journal of Integrated Care. Cara Brown conceived and designed the study. Cara Brown was responsible for the development and management of the study, conducting the analysis, interpretation of the data, writing and revising the manuscript. Verena Menec contributed to the conceptualization, analysis, and interpretation and provided feedback on manuscript drafts.

List of Material for Which Copyright Permission was Obtained

Brown, C., & Menec, V. (2018). Integrated Care Approaches Used for Transitions from Hospital to Community Care: A Scoping Review. *Canadian Journal on Aging / La Revue Canadienne Du Vieillissement, 37*(2), 145-170 © Canadian Association on Gerontology 2018, published by Cambridge University Press

Brown, C.L & Menec, V. (2018). Health, social, and functional characteristics of older adults with continuing care needs: Implications for integrated care. *Journal of Aging and Health* (Online first). DOI: 10.1177/0898264318759856. (Within copyright agreement, author may include article in a dissertation or thesis that will be uploaded to a university repository).

Chapter 1: Introduction

1.1 Area of Inquiry and Thesis Objectives

A problematic area of health care for older adults is health care transitions between care environments, such as the transition from hospital to the community (Shepperd et al., 2013). These transitions are associated with high rates of hospital readmissions and adverse events, deterioration of physical and mental status, and poor satisfaction with care (Laugaland, Aase, Barach, 2012).

To address this problem, there has been a lot of focus on evaluating the effectiveness of discharge planning interventions in improving care transition outcomes (Gonçalves-Bradley, Lannin, Clemson, Cameron & Shepperd, 2016). Discharge planning is defined as "the development of an individualized discharge plan for a patient prior to them leaving hospital for home" (p. 6, Gonçalves-Bradley et al., 2016) and consists of pre-discharge hospital activities with or without post-discharge support typically provided by hospital affiliated staff (Duke Evidence-based Practice Center, 2011; Gonçalves-Bradley et al., 2016). The definition of a care transition is broader than, and incorporates, the concept of discharge planning. It is defined as: "a set of actions designed to ensure the coordination and continuity of healthcare as patients transfer between different locations or different levels of care within the same location" (Coleman & Boult, 2003, p. 556). A care transition includes preparations within the environment being left, the actual movement from one environment to another and care provided upon arriving in a new environment.

Discharge planning interventions initially demonstrated success in impacting health service outcomes such as reducing hospital lengths of stay as well as hospital readmissions (Gonçalves-Bradley et al., 2016; Shepperd et al., 2013). However, recent studies of discharge planning have shown less improvement in these health service outcomes than has been achieved in the past (Kansagara et al., 2016), and intervention success has varied across different institutional and population contexts (Leppin et al., 2014; Ohuabunwa, Jordan, Shah, Fost & Flacker, 2013; Parrish, O'Malley, Adams, Adam & Colemen, 2009). Not only do there continue to be issues with health service outcomes, there also continues to be issues with patient-oriented outcomes. For instance, there are concerns that there is a lack of patient involvement in discharge planning processes (Healthwatch, 2015), and Health Quality Ontario found that 50% of Ontarians lacked basic self-care knowledge post-discharge (2013a).

The plateau of improvement in care transition outcomes suggests that a new approach is needed to address this persistent health care challenge, especially in light of increasing chronic disease in the aging population (World Health Organization [WHO], 2015) within a health system with limited resources (Chapin, Chandran, Sergaent & Koenig, 2014; Nordmark, Zingmark & Lindberg, 2015). Interventions in more recent studies with comprehensive interventions that incorporate both pre-hospital and post-hospital components have been more effective than interventions contained to discharge planning (Kansagara et al., 2011). This suggests that a less hospital-centric approach to improving care transitions is needed (Kansagara et al., 2011).

Integrated care has potential to improve these care transition outcomes. Integrated care is an approach to health and social care that is gaining recognition for providing a higher quality of care for older adults and/or people with chronic disease while maximizing health resource efficiency (WHO, 2015; Chappell & Hollander, 2013).

Integrated care is defined as the application of multiple methods to improve alignment and collaboration between different components of the health and social care sectors to reduce fragmentation, particularly for patients with complex, long-term care needs. Integrated care is a broad concept and includes initiatives that could occur at upper administrative levels, at the organizational level, or at the direct clinical care level (Kodner & Spreeuwenberg, 2002). Since this framework aims to balance the needs of patients with the needs of the system, it encourages improved continuity of care when care transitions are required, and also advocates for avoiding unnecessary care transitions that can be disruptive to patients and taxing on the health care system (Chappell and Hollander, 2013).

While there is no single “best practice” framework, integrated care is being embraced and implemented in different forms across Canada and within Manitoba (Howlett, 2011; SevenOaks General Hospital, 2013; Maruthappu, Hasan, & Zeltner, 2015). Research on integrated care frameworks has demonstrated efficacy in reducing tertiary care use (Vedel, Monette, Beland, Monette & Bergman, 2011), but empirical work on integrated care practices specific to care transitions is more difficult to locate. Further, as most empirical work has focused on the outcomes of integrated care, there has been little evidence generated on the extent of integrated care occurring in day-to-day care delivery that would impact older adults as they transition between settings.

Although integrated care approaches have the potential to improve care transitions, they have not been a focus in the current care transitions literature. Therefore, the overall aim of this thesis was to examine the integrated care practices and needs of older adults with continuing care needs who transition between medical hospital wards and community care. Older adults are being targeted in this dissertation for two reasons. First, this population is consistently found to be at higher risk for poor hospital discharge outcomes such as readmissions and adverse events (Health Quality Ontario, 2013b; Vivanco & Roberts, 2011). Second, integrated care is believed to be most effective when applied to populations who tend to be subject to fragmentation of care. The older adult population, in particular older adults with chronic diseases, is believed to be a population that would experience improvements in quality and efficiency with the application of integrated care (Maruthappu et al., 2015). In this thesis, older adults on general medicine wards are being targeted because it is a heterogeneous population that has been less amenable to care transition interventions (Rennke et al., 2013). The specific research objectives of this thesis were:

Objective 1: To systematically examine the existing literature on care transitions among older adults requiring continuing care from a broad integrated care perspective.

Objective 2: To characterize the older adult population that could benefit the most from integrated care approaches from a systems perspective, by looking at the association between personal characteristics of hospitalized older adults and health service outcomes.

Objective 3: To explore the feasibility of indicators for determining the extent and variation of clinical-level integrated care delivery for supporting older adult care transitions.

This thesis moves from examining the concept of integrated care from its broadest sense (objectives 1 and 2), to a more specific examination of integrated care in front-line clinical care (objective 3). This work provides an important knowledge base to understand care transitions through the lens of integrated care, and a foundation for future research aiming to measure clinical level integrated care delivery. As such, it provides important information to researchers and policymakers seeking to improve the coordination, continuity and quality of care transitions for older adults with complex care needs.

1.2 Structure and Organization of the Thesis

This thesis is in manuscript style. Embedded within it are three distinct but inter-related manuscripts that correspond to the three main objectives of this thesis (Table 1.1). Table 1.2 provides an overview of the chapters to aid the reader in navigating the thesis. Chapter 1 provides an introduction to this thesis. Chapter 2 is an overall literature review and provides the rationale for this work. Chapter 3 directly addresses objective 1 with a scoping review and is structured in a manuscript style. Chapter 4 is a linking chapter. In this chapter I outline the conceptual framework I developed following completion of the scoping review, which informed the remainder of the research. Chapter 5 outlines the methodology and methods used to address the second and third objectives of this thesis. Chapter 6 is a linking chapter that prepares the reader for the manuscript in the following chapter (Chapter 7), Chapter 7 addresses objective 2 of this thesis. Chapter 8 is another linking chapter to transition to the next manuscript that addresses objective 3, which is presented in Chapter 9. In Chapter 10, I provide an overarching discussion and conclusion that addresses all three of the original pieces of work together.

Table 1.1: Overview of thesis objectives and corresponding chapters

Objective	*Chapter*
1. To systemically examine the existing literature on care transitions among older adults requiring continuing care from an integrated care perspective.	3
2. To characterize the older adult population that would benefit from integrated care approaches from a systems perspective.	7
3. To explore the feasibility of indicators for determining the extent	9

and variation of clinical-level integrated care delivery.

Table 1.2: Chapter overview

Chapter 1: Introduction
Chapter 2: Literature Review and Rationale for the Thesis
Chapter 3: Integrated Care Approaches Used for Transitions from Hospital to Community Care for Older Adults: A Scoping Review
Chapter 4: Conceptual Framework
Chapter 5: Setting and Methods
Chapter 6: Linking Chapter
Chapter 7: Health, Social, And Functional Characteristics of Older Adults with Continuing Care Needs: Implications for Integrated Care
Chapter 8: Linking Chapter
Chapter 9: Indicators for Integrated Care Delivery: Development and Feasibility
Chapter 10: Conclusion

The reader will note redundancies between the Methods (Chapter 5) and sections of Chapters 7 and 9 (introduction and methods). I repeated this information in each manuscript, as each was constructed as a stand-alone and self-contained manuscript prepared for publication. Further, the reader will note that Chapter 5 provides more information about the iterative nature of the methods relevant to the development of indicators than is found in Chapter 9, as this level of detail does not lend itself to publication. In keeping with the structure of stand-alone manuscripts, the references for in-text citations included in the body of Chapters 3, 7, and 9 are found at the end of those respective chapters. The references for Chapters 1, 2, 4, 5 and 10 are located at the end of this document.

Chapter 2: Literature Review and Rationale for the Thesis

The main body of this chapter is a literature review, followed by a section providing a rationale for this thesis. The literature review has four main sections. First, I expand on the problem instigating this thesis by detailing the issues with care transitions for older adults. Second, I outline the personal characteristics that predict poor health service outcomes. As one of my thesis objectives was to look at personal characteristics of hospitalized older adults and how these characteristics relate to poor health service outcomes, it was important to look at previous research in this area. The third section of the literature review provides the reader with a broad overview of integrated care, an alternative way to conceptualize care transitions. The fourth section then describes the current state of literature that integrates the concepts of care transitions and integrated care.

2.1 Description of the Problem: Older Adults and Care Transitions

As noted previously, a *care transition* was defined for this thesis as, "a set of actions designed to ensure the coordination and continuity of healthcare as patients transfer between different locations or different levels of care within the same location" (Coleman & Boult, 2003, p. 556). More specifically, a *successful* care transition was defined for this thesis as "a coordinated set of actions that optimizes safety, resident centeredness, effectiveness, efficiency, timeliness and equity, across the entire transition" (p. 5, Cummings et al., 2012). This definition emerged from a study of care transitions between nursing home and the emergency department (Robinson et al., 2012). The study found that the six domains of health care quality developed by the Institute of Medicine

(IOM, 2001) are consistent with the expectations of health providers and patients involved in care transitions

Problems related to care transitions from hospital to community for older adults have been well documented in the literature and have been demonstrated using both quantitative and qualitative methodologies (Canadian Institute of Health Information [CIHI], 2012; Forster et al., 2004; Healthwatch 2015; Mockford et al., 2017). This section discusses issues related to care transitions for older adults. The information is grouped according to IOM quality care domains (2001), to be consistent with the definition of a successful care transition being used for this thesis: safety; effectiveness; timeliness/efficiency; equity; and patient-centredness. While several of these domains overlap, they provide a general framework for organizing this vast body of literature.

Literature for this section was found with a search in PsychInfo and PubMed using keywords Health AND Transition OR “Discharge Plan*” OR “care transition” and filtering by language (English), age (older adults [65 years and older]), year (2000 -2016; searched for update in May, 2018). Articles focused on psychiatric institutions were excluded. Articles were also gathered from my personal literature collection, database alert updates, and reference lists of relevant articles.

2.1.1 Safety.

The IOM states that “patients should not be harmed by the care that is intended to help them.” (p. 44, IOM, 2001). The most commonly researched outcome to determine safety of care transitions from hospital is *adverse events* (AE’s). AE’s are injuries or illnesses that are, at least in part, from medical care; in this case, as a result of poor care transition planning (Forster, Murff, Peterson, Gandhi & Bates, 2003). At least one in five people discharged from an acute medical ward experience an AE in the three weeks post-discharge in both the United States and Canada (Forster et al., 2003; Forster et al., 2004). Of these, at least a quarter of the events were considered preventable and another quarter considered ameliorable. The majority of AE's are drug related, meaning that the person discharged had an injury or illness that occurred as the result of a medication error or omission, such as a lack of drug monitoring (Forster, Murff, Peterson, Gandhi & Bates, 2005). However adverse events have also been found to result from: errors in medical test interpretation not recognized before discharge; falls at home soon following discharge; a lack of diagnosis at discharge; a lack of follow-up arrangement leading to deteriorating health; patient discharge despite clinical instability; and a lack of patient teaching regarding discharge therapies and precautions (Forster et al., 2003).

2.1.2 Effectiveness.

The IOM (2001) defines effectiveness as care that has evidence to support its use, including whether or not an intervention did what it was intended. In the context of care transitions, effectiveness is often measured with health service outcomes such as readmissions and emergency department visits (ED). The rationale is that an effective care transition should ensure that a patient's needs are adequately met to the degree that they can remain safely at home post-discharge, rather than needing to be re-admitted to hospital or the ED.

In the United States, hospitals are financially penalized for 30-day readmission rates that are higher than the national average (Kristensen, Bech, & Quentin, 2015). The introduction of these policies has resulted in thirty-day readmission rates being a frequently studied outcome related to effectiveness. Medicare beneficiaries have a readmission rate of almost 20%, although there is lack of agreement on the proportion of readmissions that are preventable (Jencks, Williams & Coleman, 2009; van Walraven, Bennett, Jennings, Austin, & Forster, 2011). The proportion of preventable readmissions reported varies from 5% to 79%, and depends on the methods and context of the study as well how “preventable” has been defined (CIHI, 2012; Medicare Payment Advisory Commission, 2009; van Walraven et al., 2011; van Walraven, Jennings & Forster, 2012). In most readmission studies, expert reviewers are used to determine whether or not each readmission in the study was avoidable. With the exception of studies specific to adverse drug events, the review criteria are subjective (van Walraven et al., 2011). However, we do know that medical patients tend to be readmitted for the same condition instigating the original hospital admission; therefore improved management of chronic conditions could be targeted in order to reduce readmissions (CIHI, 2012).

Emergency department (ED) use post hospitalization is also thought to be problematic for older adults. Nearly one quarter of patients discharged from a Boston hospital returned to the ED of that same hospital within 30 days of discharge (Rising, White, Fernandez & Boutwell, 2013). Reported Canadian rates are lower with 10.8% of general medicine patients returning to the ED, although this rate increases with age, with older adults recently discharged from a general medicine ward being 1.3 times more likely to be re-admitted to an ED than their younger counterparts (CIHI, 2012; OR=1.32 [1.29-1.35] for 65+ in comparison to under 65).

Another outcome related to effectiveness is that of communication. Poor communication between health service providers impacts the effectiveness of the health care delivery. Some issues with communication are discharge summaries with a lack of high quality information, which results in poor follow-up care (Kripalani et al., 2007; Jack et al., 2009), or discharge summaries taking an inordinate amount of time to get to the primary care provider (Kripalani et al., 2007).

There is also a large body of research examining the effectiveness of specific care transition interventions that aim to improve care quality, as well as reduce unnecessary hospital use. These studies have demonstrated that it is possible to have small reductions in hospital lengths of stay without having a rise in readmission rates (Gonçalves-Bradley et al., 2016). However, more recent intervention studies have been less successful at improving health service use outcomes, even when the interventions are similar to ones that have been effective in past studies (Kansagara et al., 2016; Leppin et al., 2014). One reason for this may be because discharge planning is now more commonly a component of standard hospital care (Kansagara et al., 2016). However, since these studies provide little information on what constitutes standard care, and lack a description of the community capacity and context, it is difficult to determine if improvement is being impeded because of deficiencies in hospital services, deficiencies in community capacity, or a gap between hospital and community care (Rennke et al., 2013). Further, while there is agreement that a multi-component solution is needed, there are concerns that multi-component in-hospital interventions take time, and are therefore not compatible with short lengths of stay (Gonçalves-Bradley et al., 2016).

A final category of literature related to effectiveness is research looking at accessing suitable care. For older adults requiring continuing care, effectiveness is linked to the ability of patients and their caregivers to access services following an acute care stay. Canadian qualitative literature suggests accessing needed services post-hospitalization is a challenge for some older adults. Family physicians (Jackson, Oelke, Besner & Harrison, 2012; Lapum, Angus, Peter & Watt-Watson, 2011), and home care (LeClerc, Wells, Craig & Wilson, 2002), are two services that are reportedly difficult to access. Other barriers to accessing health care services post-hospitalization include difficulty with health care system navigation (Jackson, et al., 2012), and a lack of transportation services for getting to appointments (DeForge et al., 2008; Jackson et al, 2012). Further, in a study from the United Kingdom, caregivers of patients with dementia found post-discharge home care services to be unreliable and inflexible (Mockford et al., 2017).

2.1.3 Timeliness/efficiency.

According to the IOM, timeliness refers to reducing waits, including delays in receiving care. Efficiency refers to avoiding waste of resources (2001). For care transitions, these two quality outcomes are highly inter-related. Canada and other commonwealth countries have given a lot of attention to examining the prevalence and cause of hospital stays that extend beyond medical need (CIHI, 2012; Landeiro, Roberts, Gray & Leal, 2017; Salonga-Reyes & Scott, 2017), as a delayed or slow discharge from hospital to home is considered costly to the health system (Fransoo et al., 2013; Landeiro et al., 2017). Arguably more importantly, long lengths of stay are associated with greater functional decline for older adults at the time of discharge (Zisberg, Shadmi, Gur- Yaish, Tonkikh & Sinoff, 2015).

Discharge delays are reflected in the designation of alternate level of care (ALC) (CIHI, 2009). ALC status is assigned when a patient no longer requires the intensity of acute hospital services (is medically stable) but continues to stay in an acute care bed.

ALC designation might indicate, for instance, that a person is awaiting placement to an alternate setting like a nursing home, is waiting for services to be set up for discharge, or cannot leave the hospital due to social circumstances (CIHI, n.d.a). ALC designation does not require knowledge of a patient's discharge destination, but rather depends on whether the person needs acute care services. The Manitoba Centre for Health Policy (MCHP) (Fransoo et al., 2013) found that only 3.5% of hospitalizations in a one-year snapshot in 2009 and 2010 were due to ALC, but that ALC designated patients constituted 16.7% of the total number of hospital days for that same year (Fransoo et al., 2013). This indicates that there is potential for enhancing hospital bed capacity in Manitoba by 16.7% if ALC days could be prevented.

The timing of discharge also influences patient and family satisfaction with care. Discharges that are perceived as "too early" as well as "too late" are both reported to be problematic for patients and families. On the one hand, the concerns about "too late" discharges was illustrated with a story of a family who spent a week and a half trying to convince hospital staff that they could manage the care of their family member at home (Fitzgerald, Bauer, Koch & King, 2011). On the other hand, families and patients dissatisfied with a "too early" discharge find themselves with inadequate time and information to contemplate how they will manage at home following the hospitalization (Fitzgerald et al., 2011; Lapum et al., 2011).

Also related to timing, families, patients and health professionals have all reported concerns about rushed discharge decision-making, with health professionals specifically being concerned about how this may contribute to premature institutionalization (Lapum et al., 2011; Moats, 2006). Further, being rushed through the discharge process impedes communication between the patient, their caregiver and hospital staff (Moats, 2006). In sum, satisfactory timing of hospital discharge from the perspective of patients and their caregivers requires an individualized approach and needs to be responsive to individuals' unique needs and situations.

2.1.4 Equity.

The IOM defines equity as reducing the burden of illness and improving health and function for all people (2001). There is evidence that vulnerable populations are at higher risk for difficult care transitions. For example, low income, measured using area-level income quintiles, is more likely to be associated with hospital readmission (CIHI, 2012). Further, discharge-planning interventions have been less successful in improving readmission rates when implemented within low-income populations than in middle-income populations (Ohuabunwa et al., 2013).

Qualitative and survey research with older adults indicates that ageism may also be an issue for older adults needing care transition support. Some older adults report that they are not included in their care planning, and others feel that they were not treated with respect and dignity (Healthwatch, 2015; Rydeman, Törnkvist, Agreus & Dahlberg, 2012). Further information on how patient characteristics relate to care transitions is provided in Section 2.2.

2.1.5 Patient-centredness.

The IOM (2001) defines patient-centredness as being focused on the patient's experience of illness and health care, and meeting individual health care needs. In the care transitions literature, experiences of patient-centredness have primarily been explored using qualitative methods. The primary objective of these studies is typically to learn about experiences of care transitions, rather than focusing specifically on “patient-centredness”. However, the results of these studies often include a theme incorporating the concept of patient-centred care. This body of literature indicates that despite increased focus on patient-centredness in the last 20 years in Canada, challenges in implementing it persist (Healthwatch, 2015; LeClerc & Wells, 2001; LeClerc et al., 2002; Wells, 1997).

Studies conducted in Canada, the US, and the United Kingdom (UK) show that older adults and caregivers often feel excluded from care transition planning and decision-making (Jeffs et al., 2016; Harrison, Greysen, Jacolbia, Nguyen & Auerbach et al. 2016; Mockford et al., 2017). Older patients report that their own personal assessment of readiness for hospital discharge was not given weight in discharge planning decisions (Lapum et al., 2011). Further, caregivers, including formal caregivers such as family physicians, are often not engaged in the care planning (Jackson et al., 2012; Jeffs et al., 2017; Lapum et al., 2011; Mockford et al., 2017). In one study, older adults who reported satisfaction with their understanding of their medical care were those who took an active role to seek out and track information (Knight, Thompson, Mathie & Dickinson, 2011). This suggests that in order to be involved in care planning, older adults need to be proactive, a skill that not all older adults will possess, especially when ill.

Studies that have examined the specific concerns of caregivers have found that there is a lack of attention to caregivers’ emotional needs during care transitions. Spouses report that they have little time to adjust emotionally to their partner’s illness and their new role of caregiver (Bryne, Orange & Ward-Griffin, 2011). Some caregivers report a disconnect in how the caregiving role is valued. That is, caregivers feel the health system relies on them to provide a high level of care to support the patient discharge, but they feel excluded in discharge planning processes. Further, they feel that health care professionals do not adequately prepare them for the caregiving role (Bauer, Fitzgerald, & Koch, 2011; Fitzgerald et al., 2011).

Contributing to a lack of patient-centred care is that hospital care language, care pathways and processes related to care transitions emphasize the medical model rather than a patient-centred model. For example, patients are labeled “medically ready to be discharged”, and care pathways focus on medical needs for discharge. Therefore, the emphasis of care tends to be on medical needs rather than considering functional, social and environmental issues that may be barriers for older adults’ capacity for coping at home post hospital discharge (Bryne et al., 2011; Chapin et al., 2014; Connolly et al., 2009; Greysen et al., 2014; Lapum et al., 2011).

Another major gap is patient-centred communication. Patients have been found to be unaware of their diagnosis or lacking understanding of their medication regime (Jack et al., 2009; Rennke et al., 2013). Older adults report that the explanations they are provided about their medication regimes are not always sufficient, and that written instruction is not consistently provided (Knight et al., 2011). They also find that discharge instructions are not adequately individualized enough to provide guidance on how to manage in their own environmental and recovery context (Lapum et al., 2011). Patients, families, and informal caregivers also note that they are not given clear information about the discharge plan or discharge timing. For example, patients report not knowing of their discharge date in advance, receiving mixed messages from different health care professionals about discharge timing, receiving inadequate communication about discharge processes, and not having a mutually agreed upon discharge plan between themselves and their providers (Bauer, Fitzgerald & Kock, 2011; Foust, Vukovic & Henriquez, 2012; Fitzgerald, Bauer, Koch & King, 2011; Jeffs et al., 2016; Knight et al., 2011, Mockford et al., 2017).

2.1.6 Summary of description of the problem: Older adults and care transitions

In summary, there remain challenges in implementing high quality care transition services, due to factors at both the system and care provider level. Some of the main challenges are poor communication between the hospital and the community, difficulty coordinating and/or accessing suitable post-hospital services that results in longer than necessary hospital stays, and a lack of a patient/family focus in the hospital. One approach that has been taken to improve care transition care has been to determine specific patient populations at higher risk of poor care transitions, so that they can be targeted for care transition interventions. This issue is discussed in the next section.

2.2 Personal Factors Influencing Care Transition Outcomes

One approach to improve care transitions is to target specific high need groups that have high levels of undesirable health care use. There are three health service use outcomes that are often considered undesirable in the health services literature. First, the main outcome that has been studied is risk of readmission within 30 days of hospital discharge (Kansagara et al, 2011). Second, studies exploring the phenomenon of ALC mentioned earlier have also explored the personal factors that are correlated with ALC status (Fransoo et al., 2013; Vivanco & Roberts, 2011), Lastly, nursing home admission directly from hospital has been considered in research. Discharge straight to nursing home from hospital carries the risk of pre-mature institutionalization, as it may not be clear at the time of discharge if poor function is transient or permanent (Zisberg et al., 2015).

I will briefly discuss studies on the relationship between personal characteristics and each of these three outcomes of care. Study results are summarized in Table 2.1.

Table 2.1: Summary of personal factors related to care transition outcomes

Factor	Predictive of (references)		
	30-day readmission	**ALC**	**Nursing home admission**
Demographic			
Older age	Campbell, Seymouri & Primrose, 2004; Health Quality Ontario, 2013b	Fransoo et al., 2013; Vivanco & Roberts, 2011	Campbell, Seymouri & Primrose, 2004
Female	Health Quality Ontario, 2013b		
Rural residence	Health Quality Ontario, 2013b; Kansagara et al., 2011		
Urban residence		Fransoo et al., 2013	
Low income neighbourhood	Health Quality Ontario, 2013b; Kansagara et al., 2011		
Social Support			
No spouse	Howie-Esquivel & Gygax Spicer, 2012	Fransoo et al., 2013	
Function			
Higher activities of daily living assistance needed	Kansagara et al., 2011	Vivanco & Roberts, 2011	Campbell et al., 2004; deBuyser, Petrovic, Taes, Vetrano & Onder, 2013
Falls/Mobility	Fathi et al., 2017		Fisher, Graham, Ottenbacher, Deer & Ostir, 2016
Health Status			
Poor self-rated health	Coleman, Min, Chomiak & Kramer, 2004		
Visual impairment	Coleman et al., 2004		
Presence of specific clinical conditions and/or procedures	Health Quality Ontario, 2013b	Fransoo et al., 2013; Vivanco & Roberts, 2011	Campbell et al., 2004; Lin, Luk, Chan, Mok, Chan, 2015; Rapp et al., 2015
Higher comorbidities or comorbidity index	Health Quality Ontario, 2013b; Kansagara et al., 2011	Vivanco & Roberts, 2011	
Higher cognitive impairment	Kansagara et al., 2011	Fransoo et al., 2013; Vivanco & Roberts, 2011	Campbell et al., 2004

Presence of mental illness	Kansagara et al., 2011	Vivanco & Roberts, 2011	Bressi Nath & Marcus 2012
Alcohol or substance abuse	Kansagara et al., 2011		
General medical patient	Rennke et al., 2013		
Malnutrition			deBuyser et al., 2013
Health Service Use			
Higher previous ED and hospital use	Health Quality Ontario, 2013b; van Walraven et al., 2010		
Admitted via ED	Health Quality Ontario, 2013b		
Higher resource intensity	Health Quality Ontario, 2013b		
Longer length of stay	Health Quality Ontario, 2013b		

2.2.1 Personal characteristics related to readmission.

Hospital readmission is the most studied outcome of care transitions. Kansagara and colleagues (2011) summarize the literature on personal factors related to 30-day hospital readmission for medical patients (of any age) in a review of 30 studies that involved 26 predictive regression models, with most of the studies conducted in the US. Seven predictive models were developed for identifying high-risk patients early in hospital admission (c statistic range 0.56-0.72) and five for use at discharge (c statistic range 0.68-0.83). The c-statistic represents the proportion of times that the model accurately discriminates between a high-risk and low-risk patient with a c statistic of 0.50 indicating that the model has the same predictive ability as chance. Kansagara and colleagues concluded that most of the models had poor predictive ability, with the exception of two models that included functional and social variables.

In the Canadian context, Health Quality Ontario (2013b) reports that those more likely to be readmitted to medical wards are: older; female; have co-morbidities; have higher use of health services prior to, and during the hospital admission; have specific clinical conditions on admission (COPD; heart failure; irritable bowel syndrome; gastrointestinal obstruction; cirrhosis; and diabetes); live rurally; and live in a low income neighbourhood. However, social and functional factors were not studied in this work, leaving a gap in knowledge as to whether social and functional variables predict readmission in Canada.

2.2.2 Personal characteristics related to ALC status.

I found two studies looking at the personal characteristics related to ALC status. Both were conducted in Canada and used predictive modeling of ALC using logistic regression (Fransoo et al, 2013; Vivanco and Roberts, 2011). One study developed a model that predicted 84% of ALC cases using data from four hospitals (Vivanco and Roberts, 2011). The second study used Manitoba administrative data (Fransoo et al, 2013). The findings indicate that older age (Fransoo et al, 2013; Vivanco and Roberts, 2011), having more co-morbidities (Vivanco and Roberts, 2011), not having a spouse (Fransoo et al, 2013), having functional impairment (Vivanco and Roberts, 2011), having certain specific disorders (Fransoo et al, 2013), and cognitive impairment (Vivanco and Roberts, 2011) all increased the likelihood that patients would be designated as ALC. Overall, these findings indicate that older adults with chronic disease and functional impairment are at risk of hospital stays that are longer than medically required. However, overall, social and functional factors related to ALC status have been minimally studied.

2.2.3 Personal characteristics related to admission to nursing home direct from hospital.

There is limited literature on the predictors of admission for nursing home from hospital. The following factors have been found to be associated with transfer from hospital to nursing home: older age (Campbell, Seymouri, & Primrose, 2004), presence of a mental illness (Bressi Nath & Marcus, 2012), presence of dementia or poor cognitive status (Campbell et al., 2004; Lin, et al., 2015), higher ADL dependency (Campbell, et al., 2004; deBuyser, Petrovic, Taes, Vetrano & Onder, 2014), presence of malnutrition (deBuyser et al., 2014), pre-admission mobility (Fathi et al., 2017), and some specific physical diagnoses (Campbell, et al., 2004; Rapp et al., 2015).

2.2.4 Summary of personal characteristics

Overall, research shows that older adults are at risk for undesirable health care use, including hospital readmission, ALC, and nursing home admission from hospital. In addition, multiple factors contribute to these poor outcomes, including previous health service use, specific health conditions or multi-morbidity, demographic, social, and functional characteristics. However, the aim of most research that has been conducted on predictors of health service outcomes has been to develop hospital admission risk screening tools to identify patients who require care transition support. Therefore, with the exception of two studies (Coleman, Min, Chomiak & Kramer, 2004; Fathi et al., 2017), social and functional information was collected upon hospital admission, and therefore preadmission data were self-reported. We have less knowledge about the preadmission community status of individuals and how this links to their health service use.

2.3 Summary: Care Transitions

The evidence is clear that care transitions from hospital to home are often problematic for older adults. This is despite efforts to improve care transition quality over the last twenty years, and to target individuals who may be at risk of poor care transition outcomes at the time of hospitalization. More recent evidence suggests that broader care transition interventions, rather than hospital-oriented discharge planning intervention, can better address the needs of older adults transitioning between the hospital and the community. Integrated care is an approach that has promise for informing the design of these interventions. The next section of this literature review provides a broad overview of this concept.

2.4 Integrated Care

2.4.1 Origin and definition.

Integrated care is an approach to health and social care for people with long-term problems that require the care and input from multiple services, providers and settings (Kodner & Spreeuwenberg, 2002). Thus, it is a promising approach for older adults at risk of poor care transitions between the hospital and home, as described in the previous section.

The concept of integrated care is considered an umbrella term for initiatives aiming to reduce fragmentation (Shaw, Rosen & Rumbold, 2011). It was developed as a reaction to a proliferation of health care institutions, professionals and services, that allowed for increased health care capacity, but also resulted in systems that are difficult to navigate (Ferris et al., 2017). For instance, the use of multiple specialists that are located in separately administered health care institutions, clinics and centers results in uncoordinated care with negative unintended consequences such as inefficiencies, ineffectiveness, inequality, commoditization, commercialization, deprofessionalization and depersonalization (Snowdon & Cohen, 2011; Stange, 2009).

In the 1980's, attempts to address fragmentation were clinically focused, and included concepts like coordinated care, case management, and shared clinical planning (Shaw et al., 2011). In the mid-1990's, a more whole systems approach to addressing fragmentation emerged from work by Shortell et al. (1996) on organized delivery systems (as cited in Leatt, Pink & Guerriere, 2000). The vision was of networks that were accountable for providing all levels of healthcare to defined populations. More recently, there has been a shift back to a patient-oriented focus, rather than an organizational focus, as it was made evident that governance and/or organizational changes do not automatically result in integrated care at the level of clinical delivery (Beech et al., 2013; Evans, Baker, Berta & Barnsley, 2014). Further, Nelson and colleagues (2002) argue that clinical delivery can vary between wards or programs within one institution (or macrosystem), using the term microsystem to describe a team of front-line providers serving a particular population.

As a result of the changing conceptualization of integrated care over time, integrated care research and practice is inconsistent in its definition and application today. Further confusing this body of literature is the use of multiple terms related to integrated care without clear definitions or delineations such as *integrated care systems*, and *collaborative care* (Nolte & Pitchforth, 2014, p. viii). These inconsistencies are seen to be hindering the progress of integrated care research (Armitage, Suter, Oelke & Adair, 2009; Kodner, 2009).

Integrated care definitions are often adapted to represent different perspectives depending on the objective of integration. For example, The National Health Services (NHS) England developed a patient-oriented definition to drive the measurement of patient-centred care (Graham et al., 2013). This involved adopting the terminology of person-centred coordinated care rather than integrated care, as they felt this was more representative of their goals of integration. Their definition of person-centred coordinated care was care that is "planned with people who work together to understand me and my carer(s), put me in control, [and] co-ordinate and deliver services to achieve my best outcomes" (p. 5). On the other end of the spectrum, a Canadian Policy Research Networks report defined integration as "coordination and integration models at the system level that contain features that are stronger than status quo linkage models" (MacAdam, 2008). This definition emphasizes the importance of the system orientation of integrated care. In sum, definitions of integrated care vary according to the viewpoint. For patients, integrated care is about care that is easy to access and navigate. For providers, it is about coordinating care across providers and services. For managers, it might be about coordinating performance targets (Kodner, 2009).

In this dissertation, I will use one of the most cited definitions of integrated care by Kodner & Spreeuwenberg (2002):

> "a coherent set of methods and models on the funding, administrative, organizational, service delivery and clinical levels designed to create

> connectivity, alignment and collaboration within and between the cure and care sectors. The goal of these methods and models is to enhance quality of care and quality of life, consumer satisfaction and system efficiency for patients with complex, long term problems cutting across multiple services, providers and settings. The results of such multipronged efforts to promote integration for the benefit of these special patient groups is called 'integrated care' "(p. 3).

This definition can be applied broadly to research and practice on integrated care because it acknowledges the need for both top-down administrative integration as well as bottom-up patient-driven integration. Further, this definition highlights that there are often dual desired outcomes from integrated care initiatives: improvement in patient-oriented outcomes as well as system-oriented outcomes (Nolte & Pitchforth, 2014, p. 1).

2.4.2 Shared integrated care concepts.

Despite high variation in the definition and application of integrated care in the literature, there are integrated care concepts for which there is agreement. Understanding these commonalities can help to better understand the meaning of integrated care.

The *breadth* of application of integrated care is described in terms of horizontal or vertical integration. Horizontal integration links services within the same level of health care. An example of horizontal integration is the linking of community care nursing services and general practitioners, or the linking of home health services and social services. Vertical integration increases collaboration between different levels of care. An example of this would be linking secondary or tertiary hospital services with primary health services (RAND Europe, 2002).

There is also common agreement that integration can occur at macro levels such as financing, administration and organization, or more micro levels, like service delivery and clinical (Curry & Ham, 2010; Kodner & Spreeuwenberg, 2002). These are referred to as the *types*, or *domains* of integration. It is believed that lack of integration in one domain can interfere with integration in other domains, and as mentioned earlier, it has been established that administrative integration does not automatically lead to clinical integration (Curry & Ham, 2010).

Finally, there is agreement that integration can occur to different degrees. Leutz (1999) proposed a continuum of integration. See Figure 2.1 for a conceptual illustration of this continuum based on the description by Leutz (1999). On one end of the continuum is fragmentation or segregation (Valentijn, Schepman, Opheij &. Bruijnzeels, 2013), whereby services and programs operate completely independently of one another in siloes. On the very other end of the continuum is full integration, where there is pooling of resources of several services and programs, and care providers work together to provide care in all settings. An intermediary step between fragmentation and integration is where there are *linkages* between programs and services, to allow providers to screen for user needs in a more holistic manner, and refer to the appropriate services for their care needs. Another step up the continuum from linkages towards integration is coordination (Leutz, 1999), whereby services and programs still operate as separate entities, but these services coordinate the provision of care together. For example, the services may share clinical information, and work together to decide who will take primary responsibility for care accountability.

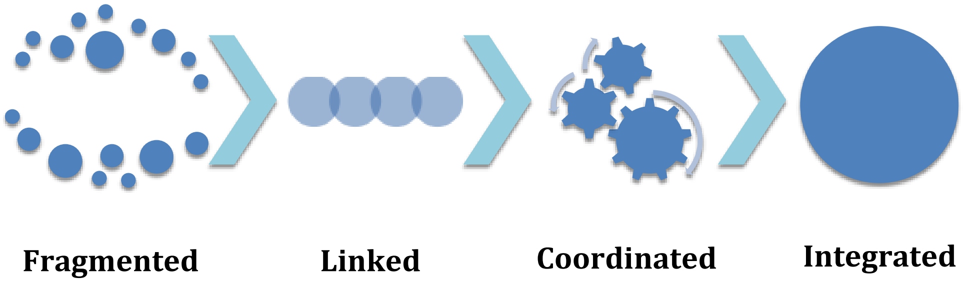

Figure 2.1: Conceptual illustration of the extent of integration continuum. Developed from description of continuum of integated care by Leutz (1999)

2.4.3 Integrated care frameworks relevant to care transitions for older adults.

Integrated care frameworks have been developed to guide research and best-practice health system change. Over the course of completing this dissertation, several frameworks and taxonomies were referenced for conceptualizing integrated care. However, three integrated care frameworks were most influential in framing this thesis from beginning to end. As such, I will provide an overview of these three frameworks here, and speak to other supporting frameworks and taxonomies that I used in the sections of this thesis to which they are relevant.

Integrated care frameworks address two main areas of health and social care; primary care, and special populations that require complex or continuing care, such as people with disabilities, and older adults. The use of fully integrated care systems for the frail elderly population has been promoted for decades (Kodner & Kyriacou, 2000; Chappell & Hollander, 2013), and this thesis was informed by two frameworks relevant to the topic of care transitions for older adults: the Hollander and Prince framework (2008) and the Kodner and Spreeuwenberg framework (2002). Further, the Rainbow Framework (Valentijn et al., 2013), while intended for primary care application, is very well developed and unites several integrated concepts. As such, it is also discussed here.

2.4.3.1 Hollander and Prince (2007): The Enhanced Continuing Care Framework.

The most influential framework for this thesis was the Enhanced Continuing Framework (ECCF). It conceptualizes an ideal integrated care system for older adults with continuing care needs (Table 2.2). Its development was based on a review of systems of care delivery for people with ongoing care needs that involved interviewing 270 senior policy-makers and experts across Canada. The ECCF is primarily a top-down framework; it emphasizes philosophical and policy prerequisites that provide a base for the development and application of best practices of continuing care, including the use of a psychosocial model of care, sustained funding of a full range of services, and client-centred care. Administrative and clinical best practices then support the development of linkage mechanisms between different layers of the health system and other sectors providing care services. Administrative best practices include integrated information systems and a single funding envelope for all services. Clinical best practices include a coordinated entry system and system-level case management. Linkage mechanisms include initiatives such as staff that can span boundaries between services and programs to provide care, cross-sectoral committees and co-location of staff.

The overall structure of integrated care of the ECCF guided the work in this thesis. This framework has a broad scope for integrated care that was particularly helpful for addressing the first objective of this thesis, which was to systematically review the literature on integrated care initiatives for care transitions. This broad context is important since empirical research to date has lacked broad descriptions of context (Rennke et al., 2013). Particularly helpful for guiding the entire thesis was the emphasis on philosophical foundations of integrated care, which are not as strongly addressed in other frameworks. Finally, another major strength of the framework is the explicit equal emphasis on horizontal and vertical integration of care. This was an important addition as much of the Canadian literature focuses on horizontal integration of community care (Chappell & Hollander, 2013), while care transitions requires an emphasis on both types of integration.

The main weakness of this framework is the lack of specificity in how it would be operationalized, a major reason why this thesis was guided by multiple integrated care frameworks.

Table 2.2: The Enhanced Continuing Framework (ECCF)*

Philosophical and Policy Prerequisites	Best Practices for Organizing a System of Continuing Care	Linkage Mechanisms
-Belief in systems of care -Commitment to full range of services and **sustained funding** **-**Commitment to **psychosocial model** of care -Commitment to **client-centred** care -Commitment to **evidence-based decision-making**	*Administrative* -Policy promoting integration -Coordinated administration -Single funding envelope -Integrated information systems -Incentive for evidence-based management *Clinical* -Coordinated entry-system -System-level care authorization -System-level classification system -System-level case management -Involving clients and families	*Between groups with continuing care needs, hospitals, primary care, and other health and social services such as:* -Boundary spanning staff -Physician consultants in the community -Increasing mental and physical care service integration -A mandate for coordination -High-level cross-sectoral committees -Co-location of staff

*Adapted from Hollander and Prince, 2007, p. 46

2.4.3.2 Kodner and Spreeuwenberg (2002)

Whereas the ECCF suggests the implementation of integrated care practices in multiple domains simultaneously, the Kodner and Spreeuwenberg (2002) framework advocates for a more tailored approach to integrated care, depending on the needs of the context and the population. This framework portrays different domains in which strategies can be implemented, along a micro to macro continuum. The implementation of integrated care can occur within one or more of five domains, depending on the goals of integration. The five domains from macro to micro are: funding, administrative, organizational, service delivery, and clinical. For example, strategies under “finances” include prepaid capitation and pooling of funds. Strategies under “clinical” include decision support tools and regular patient contact and ongoing support. A strength of this framework is the provision of explicit definitions and examples of integrated care within each of these domains.

While the Hollander and Prince framework emphasizes top-down mechanisms, the Kodner and Spreeuwenberg framework emphasizes bottom-up implementation of integrated care just as much as top-down. Also unique to the Kodner and Spreeuwenberg framework is the emphasis on within-institution integration, as well as between-institution integration. Since large organizations (such as hospitals and regional health authorities) tend to decentralize and divide service delivery to manage the complexity of the environment, an emphasis on cooperation and coordination is essential to prevent fragmentation (Kodner & Spreeuwenberg, 2002).

The level of detail of integrated care strategies that can be used in different domains was used to better understand and recognize integrated care in my scoping review (objective 1) and provided guidance in developing the integrated care indicators (objective 3). However, the main contribution of this framework is its emphasis on the importance of within-institution integration, as well as between institution and service integration. Since I was studying care transitions between the hospital and community, it was essential to emphasize the importance of integrated care approaches within the hospital. However, a limitation of this framework is that it was not developed empirically.

2.4.3.3 The Rainbow framework (Valentijn et al., 2013).

This framework was less influential in this work, since it was developed from a primary care perspective, and does not explicitly speak to care transitions. Nevertheless, it is an empirically developed framework that had some important features that were helpful for my work. The framework was developed from both a narrative literature review and expert panel that was asked to synthesize the literature findings (Valentijn et al., 2013). Similar to the other two frameworks already discussed, this framework includes multiple domains, which are visually in concentric circles around the person to represent the integration needs at the micro, meso and macro levels (clinical, professional, organizational and system integration). It includes functional integration and normative integration as threading through these four domains. Functional integration refers to support functions like human resources, management and strategic planning. Normative integration refers to shared values and goals within and between organizations.

One feature of integrated care that is emphasized in this framework more than others is in the use of a biopsychosocial model of care. It also is more explicit in outlining the importance of interprofessional teams in providing this model of care, and the importance of integration of these health professionals. While the importance of interdisciplinary teamwork is implicit in the other frameworks, the Rainbow framework makes this feature more explicit. In addition, this framework has a core value of being both person and population-focused, thereby making more explicit the dual goals of integrated care frameworks that is, involving health service delivery change targeted at both the system as well as individual level. Finally, this framework has an evidence-based associated taxonomy of integrated care features that itemizes components of integrated care within each integrated care domain (Valentijn et al., 2015).

2.4.3.4 Framework commonalities.

While these three frameworks have different overarching conceptualizations of integrated care, they have several features in common. One strong commonality is patient or client-centred care (to be used interchangeably in this thesis). A definition consistent with the three frameworks is: “providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions” (p. 6, IOM, 2001).

Chappell and Hollander (2013) extend this further by having client-centred care as a philosophical foundation of integrated care and advising clinicians, decision-makers and administrators to consider the client perspective to ensure that all care activities and policies benefit the client (Chappell & Hollander, 2013). In an integrated care framework, patient-centred care is both a part of the process of care provision and a desired outcome (Kodner & Spreeuwenberg, 2002; WHO, 2015). The patient-centred aspect of the frameworks encourages health providers to view health and social services from the viewpoint of the patient. It turns the focus from the needs and expectations of the clinician for a compliant patient, to the barriers to accessing services for patients who have complex and long-term health issues (Kodner & Spreeuewenberg, 2002).

Although each framework puts different emphasis on different domains of care, all three acknowledge that integrated care can occur in more than one domain. While not all the frameworks emphasize it equally, another commonality is promoting both vertical and horizontal integration. Finally all three frameworks have dual goals for health service improvement: improved patient outcomes as well as improved health service efficiency. More specifically, shared goals include improved access, quality, user satisfaction, efficiency, coordination and continuity (seamless care), as well as encouraging holistic and personalized approaches.

2.4.4 Key components of successful integrated care initiatives.

Two of the three frameworks discussed above (namely the ECCF, and the Rainbow frameworks) were developed with systemically gathered expert opinion. There is no empirical evidence yet to support these frameworks in their entirety; rather, research on this topic is heterogeneous, involving the implementation of multiple, but not all of the elements of integrated care frameworks. Thus, reviews of integrated care studies have focused on examining the specific features of integrated care, in an attempt to determine whether particular features are more effective than others.

Since the year 2000, there have been two reviews of systematic reviews of integrated care for the chronically ill (Martínez-González, Berchtold, Ullman, Busato & Egger, 2014; Ouwens, Wollersheim, Hermens, Hulsher & Grol, 2005), a systematic review specific to older adults (Johri, Beland, Bergman, Challis & Highes, 2003), and a systematic review not specific to any population (Suter, Oelke, Adair & Armitage, 2009). These reviews conclude that integrated care can improve health utilization outcomes, but that it is not clear if this approach is cost-effective (Johri et al., 2003; Martínez-González et al., 2014). Integrated care has a positive impact on the outcomes of quality of care (Ouwens et al., 2005), quality of life (Martínez-González et al., 2014), adherence to care (Martínez-González et al., 2014), and reduced mortality (Martínez-González et al., 2014). All the authors caution that there is great variability in the integrated care interventions and thus the interpretation of these studies needs to be done carefully as they do not necessarily support one particular intervention.

There are several features in common in effective integrated care programs, ranging from macro to micro. Effective philosophical and governance features include having a patient focus (Suter et al., 2009), and diverse governance (Suter et al., 2009). Effective organizational financial and features include having strong organizational culture and leadership (Suter et al., 2009), comprehensive service across the care continuum (Suter et al., 2009), financial incentives to promote downward substitution (Ouwens et al., 2005), equitable funding distribution for different levels of services (Suter et al., 2009), performance management (Suter et al., 2009), geographic coverage and rostering (Suter et al., 2009), and education for professionals (Martínez-González et al., 2014). Clinical features include case management (Ouwens et al., 2005), geriatric assessment (Ouwens et al., 2005), multidisciplinary teams (Martínez-González, 2014; Ouwens et al., 2005; Suter et al., 2009), self-management support and patient education (Martínez-González et al., 2014; Suter et al., 2009), and a single entry point (Ouwens et al., 2005).

Therefore, while there is emerging empirical evidence to support integrated care approaches, we still have little understanding of what combination of interventions is most effective, and if there are contextual factors that moderate the effectiveness of integrated care.

2.4.5 Measuring integrated care.

The literature on the measurement of integrated care is difficult to synthesize as it is in early stages of development with no uniformly accepted or used instruments (Lyngsø, Godtfredsen, Høst, & Frølich, 2014). The reasons for this are twofold. The first is that the sheer breadth of the concept means that there continues to be gaps in measurement development. To measure all aspects of integrated care frameworks, measurement strategies are needed for multiple domains of integrated care, and to determine the process as well as the outcome of integrated care for both patients and the system. The second main reason is the varied understanding of the concept, making it difficult to synthesize research to date (Lyngsø et al., 2014).

2.4.5.1 What to measure?

Part of the complexity of measuring integrated care is the vast range of concepts within the overarching concept that can be measured. In addition, both process and outcome measures are important for understanding the relationship between the degree of integrated care and the outcomes of integrated care (Shaw et al., 2011). Depending on the context and the questions of the researchers or policymakers, some measures focus on only one domain of integrated care, some on a mix of domains, and some on concepts embedded within integrated care (e.g. patient-centred care). Finally, since the definition of integrated care consistently has two outcomes inherent in its definition – both enhancing patient outcomes as well as system efficiency, some researchers have focused on both these concepts, and others on one or the other. Thus, there is little consistency between measures developed to date in terms of what is being measured (Lyngsø et al., 2014).

2.4.5.2 How to measure it?

Most authors advocate for measuring both user and system-level outcomes, to be consistent with the goals of integrated care (Graham et al., 2013). User feedback is typically solicited by asking questions about experiences of coordination or continuity of care or by assessing general patient satisfaction with services. Service outcomes are usually measured using administrative data of institutional utilization, such as emergency department (ED) visits, hospital length of stay, nursing home use, and 30-day hospital readmission (Nolte & Pitchforth, 2014).

Since 2009, there have been four systematic reviews of integrated care measurement, and one review of integrated care as a concept that included a section on measurement. Three of these looked at process measures (Strandberg-Larsen & Krasnik, 2009; Lyngsø et al., 2014; Suter et al., 2017), one commented on tools measuring process and/or outcomes (Strandberg-Larsen & Krasnik, 2009), and the last included related constructs in its search, such as continuity of care, patient-centred care and case management (Bautista, Nurjono, Lim, Dessers, & Vrijhoef, 2016). Further, three of the reviews were looking at macro level instruments (Armitage et al., 2009; Strandberg-Larsen & Krasnik, 2009; Lyngsø et al., 2014), while two included instruments at both micro and macro levels of care (Bautista et al., 2016; Suter et al., 2017).

Despite the different methodological approaches of these reviews, they all concluded that there is no unified or commonly accepted model or measure for measuring health system integration (Armitage et al., 2009; Lyngsø et al., 2014; Strandberg-Larsen & Krasnik, 2009). Despite a number of existing tools (one review found 209 instruments measuring integrated care and related constructs; Bautista et al., 2016), few of them are well described and empirically tested (Armitage et al., 2009; Lyngsø et al., 2014; Suter et al, 2017). There are many tools for measuring structural and/or cultural aspects, but professional, organizational,functional and clinical integration have been less studied (Bautista et al., 2016; Lyngsø et al., 2014; Suter et al., 2017). Further, there is a lack of non-questionnaire methods (Strandberg-Larsen & Krasnik, 2009; Suter et al., 2017), biasing the evidence towards the perspectives of health care administrators and staff. The need for better measurement of clinical level integrated care has been identified by both Bautista et al. (2016), who found this area to be understudied, and by Janse, Huijsman, De Kuyper, and Fabbricotti (2016) who point out that there is little research on the extent of integrated care occurring in day-to-day care delivery (Janse et al., 2016).

In sum, integrated care can be measured from the patient perspective, the service perspective or both, and needs to address both the implementation process as well as the outcome of integrated care. Developing more consensus and standardization around measuring integration has been identified as a priority for future research (Armitage et al. 2009). There continues to be gaps in integrated care measurement requiring the development of new tools, and the need for tools that use methods other than questionnaires. A gap of particular relevance to this thesis is the lack of research on clinical-level integrated care processes.

2.4.6 Integrated Care Summary

Integrated care is a term used to describe an approach to care that is patient-centred, and aligns and coordinates multiple care providers and services, with the objective of improving patient experience, as well as system-level outcomes. However, the approach to integration is highly variable, depending on the degree, domain, breadth and focus of implementation. There is growing evidence that integrated care results in improvement in outcomes, but we do not know the specific elements of integrated care that produce these outcomes. A major barrier to measuring integrated care is a lack of integrated care measurement tools for some areas of integrated care, such as clinical level measurement.

The next section of this literature review looks at how the concepts of integrated care and care transitions are currently integrated in the literature.

2.5 Integrated Care Factors Influencing Care Transition Success

A brief review of the literature found five articles about care transitions that refer to integrated care (Baumann et al., 2007, Cano et al., 2015; Dahl, Steinsbekk, Jenssen, Johnsen, 2014; Lin, Luk, Chan, Mok, & Chan Lin, 2015; Wee et al., 2014). Three of the articles reported evaluating integrated care strategies, but had little to no discussion of how the strategies were consistent with integrated care frameworks (Dahl et al., 2014; Lin et al., 2015; Wee et al., 2014). One article evaluated care transition effectiveness in light of integration of health and social services at managerial and service delivery levels that had been implemented in the United Kingdom (Baumann et al., 2007). The last article discussed the use of integrated technology to support early discharge from home (Cano et al., 2015).

Successful strategies identified in these articles (from macro to micro) were: the use of a single funding envelope (Baumann et al., 2007), collaboration and co-location of community and social agencies (Baumann et al., 2007), integrated information systems (Cano et al., 2015), intermediate care or discharge assessment beds (Lin et al., 2015), care coordinators or discharge transition planners (Baumann et al., 2007; Lin et al., 2015; Wee et al., 2014), providing transportation to patients on the day of discharge (Baumann et al., 2007), white boards for tracking care transition plans (Baumann et al., 2007), patient choice protocols to explain to patients and caregivers their rights and options for care transition planning (Baumann et al, 2007), and providing education and self-management coaching to the patient (Wee et al., 2014).

However, while many care transition articles do not use the term integrated care, many care transition interventions are multi-component, with at least or one or more of these components being consistent with integrated care principles. For instance, capitated funding has been explored by at least two programs (with mixed results) (Parrish et al., 2009; Vedel et al., 2011). In terms of administration, one author identified collaboration of community and social agencies as important in preventing discharge delays (Chapin et al., 2014), and another identified the benefit of having institutional culture and values that are consistent with patient-centered care (Hung & Leidig, 2015).

In terms of organization and service delivery, interprofessional hospital in-reach and out-reach strategies are believed to support successful care transitions (Balaban, Weissman, Samuel & Woolhandler, 2008; Hansen, Young, Hinami, Leung & Williams, 2012; Hesselink et al. 2012). Evidence is emerging that determining program entry based on functional status classification is an effective method for population targeting for programming that reduces hospital use (Doupe et al., 2011; Vedel et al, 2011). And finally, communication tools and strategies for interprofessional communication, as well as for patient communication have been well supported in the care transitions literature (Chapin et al., 2014; Coleman & Boult, 2003; Connolly et al., 2009; Hansen et al., 2011; Jack et al., 2009; Shepperd et al., 2012).

In sum, on the surface there seems to be very little literature on the use of integrated care approaches to support care transitions for older adults. However, themes related to integrated care like interprofessional collaboration and patient-centered care are evident in this body of literature. Both the care transitions and integrated care literature suggest that multi-component interventions are effective, but it is unclear which exact combination of interventions is most effective. As such, a more systematic review of published and grey literature was warranted to better understand how the concept of integrated care is being conceptualized for supporting care transitions. Aligning researchers on how the concept of integrated care is being used and expressed in relation to care transitions can support the growth of knowledge on this topic (Armitage, Suter, Oelke & Adair, 2009; Kodner, 2009).

2.6 Gaps in the Literature and Rationale for this Thesis

Care transitions between hospital and home for older adults is a problematic area in current health care practices. The scope of the issue is broad, and includes poor patient safety and satisfaction, as a well as issues of acute care resource use. Progress has been made in determining some specific hospital-implemented strategies that can reduce readmission rates for older adults (Rennke et al., 2013; Shepperd et al., 2013); however, hospital-implemented care transition programs have reached a ceiling in their ability to improve care transition efficacy (Kansagara et al., 2016), and recent qualitative literature continues to identify issues with patient-oriented outcomes, such as poor satisfaction with care, and poor post-hospital self-care knowledge (Health Care Ontario, 2013a; Healthwatch, 2015). This dissertation aims to address this issue by using the lens of integrated care to broaden the focus out from hospital activities, to how the hospital and the greater community intersect for care transitions. Integrated care aims to provide high quality care to older adults with chronic disease or disability by addressing and coordinating the complex health, social and functional needs of this population (Hollander & Chappell, 2007). The focus of integrated care frameworks on both the patient experience as well as promoting system efficiency make them a logical match for framing the multiple issues associated with care transitions for older adults.

Objective one was developed to address the apparent lack of evidence on how integrated care is being implemented specifically to address care transition challenges (Vedel et al., 2011). It was important to take a systematic approach to reviewing this body of literature, as a cursory review of the literature revealed very little intersection between the topics of integrated care and care transitions. While there have been reviews of both integrated care and care transitions, there had not been any synthesis of the literature that focused on both of these concepts. There was a need to understand explicitly how integrated care approaches are being applied to address the challenge of hospital to community transitions, in order to support evidence-based implementation of integrated care (Vedel et al., 2011).

The second objective was developed to improve our understanding of older adult medical patients in order to better target integrated care initiatives. Evidence on the effectiveness of integrated care indicates that integrated care is more effective when the services are organized for a specific population group with high needs (Evans, Baker, Berta & Barnsley 2013; Sansoni, Grootemaat, Seraji, Blanchard, & Snoek, 2015). The general medical population is a heterogeneous group, and as a result, is less amenable to hospital-implemented care transition interventions than disease-specific interventions (Rennke et al., 2013), resulting in higher rates of undesired institutional care use, such as hospital readmissions (CIHI, 2012). We need a more in-depth understanding of the personal, social and environmental background and needs of the hospitalized older adult general medicine population (Kansagara et al., 2011; Rapp et al., 2015) to determine who would be best to target for integrated care interventions, and how to best address this group’s needs.

The third objective was developed because, while we know that integrated care has potential to be efficacious for care transitions, there remains a paucity of evidence on this topic. Without knowledge of the extent of integrated care being delivered in day-to-day clinical practice, we will not be able to determine its efficacy in improving care quality. The main limiting factor in generating this knowledge is the lack of integrated care measurement tools (Lyngsø, Godtfredsen, Høst, & Frølich, 2014). Understanding the extent of integrated care in day-to-day care delivery (the clinical domain) has been identified as a research priority (Janse et al., 2016). This is particularly the case as current clinical level measures focus on practitioners’ opinions using questionnaires, leaving a need for more objective process measures of day-to-day integrated care activities. Further, there is very little work on measures of integrated care with a specific focus on care transitions. Therefore, this thesis focuses on the development of clinical level process measures to promote the generation of evidence on the extent and variation of integrated care being delivered to support care transitions, and how integrated care delivery relates to health service and patient outcomes.

Overall, this dissertation addresses the gap of what and how integrated care practices are currently being used to support care transitions from hospital to home for general medical older adult patients. It provides a knowledge base to understand care transitions through the lens of integrated care and provides direction for future research that aims to measure clinical level integrated care delivery. To do this, this thesis first explores integrated care broadly, in order to better understand how the concepts of integrated care and care transitions intersect, both in terms of intervention and population. Then the focus of the thesis narrows to clinical integrated care measurement, to address a significant gap in the integrated care literature.

Chapter 3: Integrated Care Approaches Used for Transitions from Hospital to Community Care for Older Adults: A Scoping Review

3.1 Abstract

Integrated care is a promising approach for improving care transitions for older adults, but this concept is inconsistently defined and applied. This scoping review describes the size and nature of literature on integrated care initiatives for transitions from hospital to community care for older adults (aged 65 and over), and how this literature conceptualizes integrated care. A systematic search of literature of the last 10 years yielded 899 documents that were screened for inclusion by two reviewers. Of the 48 included documents, there were 26 journal articles and 22 grey literature documents. Analysis included descriptive statistics and a content analysis approach to summarize features of the integrated care initiatives. Results suggest that clinical and service delivery integration is being targeted rather than integration of funding, administration and/or organization. To promote international comparison of integrated care initiatives aiming to improve care transitions, detailed descriptions of organizational context are also needed.

3.2 Introduction

Transitions to the community from the hospital are often difficult for older adults. Because older adults are typically sicker than younger adults, they use more hospital days than the general population to accommodate extended recovery periods, or arrangement of home care or other long-term care services (Glasby et al., 2016). As a result of the potential for deterioration of functional status while in hospital, as well as a myriad of other factors such as multi-morbidity and limited support systems, older adults are vulnerable to post-hospital adverse events and hospital readmissions (Laugaland, Aase, & Barach, 2012). In addition, older adults have reported difficulty accessing health services following hospitalization (Jackson, Oelke, Besner & Harrison, 2012; Lapum, Angus, Peter & Watt-Watson, 2011), being unsure of how to take care of themselves once at home (Knight, Thompson, Mathie & Dickinson, 2011), and feeling rushed to make important decisions about their discharge destination (Lapum et al., 2011). Better ways to manage hospital to community transitions are needed, and integrated care approaches are a promising solution for enhancing hospital and community services coordination and collaboration.

3.2.1 Integrated care

Integrated care is a health care approach recognized for providing high quality care for older adults and/or people with chronic disease while maximizing health resource use (World Health Organization [WHO], 2015; Chappell & Hollander, 2013). Integrated care approaches focus on enhancing coordination and collaboration within and between care sectors to reduce fragmentation (Kodner & Spreewenberg, 2002; Valentijn, Schepman, Opheij, & Bruijnzeels, 2013). Integrated care is believed to be most effective for populations with complex care needs who require care from multiple providers and in several settings. Thus, older adults may experience improvements in the quality and efficiency of care transitions with the application of integrated care (Maruthappu, Hasan, & Zeltner, 2015).

Integrated care approaches may integrate care services along the vertical and/or horizontal continuum of care. Vertical integration refers to bringing together different levels of health care, such as primary and secondary care. Primary care includes basic health care services provided by professionals who are typically the “first contact” with patients (such as general practitioners [GPs]). Secondary care is specialist care, including basic hospital care (Gröne & Garcia-Barbero, 2001). Horizontal integration is the coordination and collaboration of services within one level of care, and in the context of this study, usually refers to integration of community-based social and health care services (Chappell & Hollander, 2013; Gröne & Garcia-

Barbero, 2001). While the term “social services” is not clearly defined in the literature, it typically refers to all non-medical services, such as assistance with financial and housing needs, and provision of home support needs such as home maintenance, meal programs, daycare services and/or transportation (Hollander and Prince, 2007).

Since the term integrated care is used to describe a wide variety of strategies or approaches to improve care continuity and coordination, the implementation of integrated care is varied (Maruthappu et al., 2015; Valentjin et al., 2013). This variation has made it challenging to compare integrated care initiatives (Valentjin et al., 2013). However, integrated care approaches that include vertical multidisciplinary interventions are efficacious for managing chronic diseases, managing care between primary and specialist care, and reducing hospital use (Martínez-González, Berchtold, Ullman, Busato, & Egger, 2014; Mitchell et al., 2015). There has been less attention on integrated care practices in relation to care transitions between the hospital and community, despite the emphasis of integrated care as an approach that can reduce boundaries between levels of health care (Vedel et al., 2011).

3.2.2 Care transitions for older adults

The challenges with transitions from hospital to community care are well documented. Post-hospital adverse events, emergency room visits and readmission rates are high for older adults (CIHI, 2012; Forster et al., 2004) due to multiple factors such as poor communication between the hospital and primary care, lack of patient understanding of their diagnosis and self-care needs, and difficulties with accessing community care services (Jackson, et al., 2012; Rennke et al., 2013).

The body of literature evaluating intervention programs designed to improve the quality and efficiency of care transitions from the hospital to the community is vast. It has been demonstrated that personalized discharge planning can bring small reductions in hospital length of stay and readmission rates for older medical patients (Gonçalves-Bradley, Lannin, Clemson, Cameron & Shepperd, 2016). Studies on hospital-initiated interventions have identified two important features for reducing hospital readmissions: the use of a dedicated, hospital-employed discharge transition provider or team, and the use of a bridging strategy, whereby services are provided by the hospital beyond the discharge date (Rennke et al., 2013). A review by Leppin and colleagues (2014) of 47 trials using 18 types of discharge interventions, found that more recent intervention studies have been less successful at improving health service use, even when implementing interventions that were successful in the past (Leppin et al., 2014). Moreover, interventions that provide frequent and complex assistance to the older adult in their own home are most successful in reducing hospital readmissions (Leppin et al., 2014). These findings signal the need for a new approach to care transitions that is consistent with integrated care principles such as reducing barriers within and between institutions, and meeting both social and health needs in the community.

The concept of integrated care seems promising for reducing fragmentation between the hospital and the community in order to improve care transitions, but has not yet been a focus of a systematic literature review. Since integrated care is not consistently defined or applied, it is important to understand how integrated care is currently being conceptualized in relation to hospital to community transitions. Scoping reviews are helpful for presenting a broad overview of the evidence to "map the concepts underpinning a research area" (Constand, MacDermid, Dal Bello-Haas & Law, 2014, p. 2). They also identify gaps in research including determining the feasibility of a systematic review on the topic (Tricco et al., 2016). Our scoping review is unique from previous reviews on hospital to community transitions because of the explicit focus on integrated care approaches. Our overall aim was to determine research gaps and directions for future research on the topic of integrated care approaches for facilitating transitions from hospital to home for older adults. We did this by, a) outlining the size and scope of this body of literature, and b) identifying how integrated care is being conceptualized in this body of literature.

3.2.3 Conceptual framework for this study

Two integrated care frameworks influenced our thinking while conducting this study. The first is the Enhanced Continuing Care Framework (ECCF) (Hollander & Prince, 2007) because of its particular relevance to the topic of care transitions from hospitals to the community for older adults. The framework conceptualizes an ideal system for older adults with continuing care needs and specifically identifies linkages between the hospital and continuing care as important for meeting the needs of older adults. It emphasizes the importance of social as well as health care, promoting horizontal as well as vertical integration. The ECCF outlines the philosophical and policy prerequisites (e.g. patient-centred care; psychosocial model of care) that provide a base for the development and application of best practices of continuing care (e.g. coordinated administration, integrated information systems). Best practices then support the development of linkage mechanisms (e.g. staff that cross care boundaries, such as physician consultants in the community) between different layers of the health system and other sectors providing care services.

The second influence was a framework developed by Kodner & Spreeuwenberg (2002) that adds to thinking about integrated care for adults transitioning from hospital in two ways. First, it includes integration of single institutions, such as integration of different departments and professionals within a hospital. Second, rather than providing a specific framework for an integrated system, it takes a more flexible approach by proposing that one or more integration strategies can be implemented in one or more domains depending on the needs of the care environment. Kodner and Spreeuwenberg (2002) provide specific examples of strategies that can be implemented in five domains of integration that range from a macro level to a micro level: financial, administrative, organizational, service delivery, and clinical. For example, strategies for the financial domain include prepaid capitation and pooling of funds. Strategies under clinical integration include decision support tools and regular patient contact.

3.3 Design and Methods

This study was guided by a six-stage methodology proposed by Levac, Colquhoun and O'Brien (2010), who refined methodology developed by Arksey and O'Malley (2005). The first five stages outline considerations for identification of the research question, identification and selection of relevant studies, charting of data, and summarizing and reporting results. As it is optional, we did not implement the sixth stage that recommends consultation of stakeholders to gain additional perspectives on preliminary findings. We also followed recommendations as outlined in The Joanna Briggs Institute's Reviewer's Manual for Scoping Reviews (JBI; 2015) that provides detailed recommendations on protocol development, data abstraction procedures, and required components in the reporting of results.

3.3.1 Eligibility criteria

Consistent with scoping review methodology, this study was broad in its inclusion of different types of literature and did not evaluate the quality of the studies (Levac et al., 2010). Both peer-reviewed and grey literature was searched with no methodological requirement for study inclusion. Protocols were included since they provided information that was not otherwise captured, either because the studies were not yet published, or in the case of one study, the protocol had been altered during study implementation. We excluded conference abstracts and powerpoint presentations as they did not provide enough detail to determine document eligibility and/or extract data accurately. Eligibility criteria for content were developed according to the JBI guidelines (2015) that suggest the use of the mnemonic PCC (Population, Concept, and Context) to target the desired focus and scope for the review:

Concept: The document needed to explicitly explain, evaluate, describe, or propose an *integrated care* initiative. As an objective of this review was to understand how the concept of integrated care is being used in research on care transitions, all types of integrated care were included.

Context: The document needed to focus on transitions of care from an acute care environment to other care environments (including but not limited to: intermediate care, nursing home, home with or without home care services). Interventions applied in the community to prevent hospitalization readmission immediately following hospitalization were included, but interventions aimed preventing hospitalization for community-dwelling older adults were excluded.

Participants: The document needed to focus on hospitalized older adults (defined as age 65 or older). Documents with a mean age of 65 were included, even if some of the participants were under 65.

3.3.2 Information sources and search strategy

The search was comprehensive and designed to locate both published and unpublished literature within the field of health and health services. The search strategy was developed with the advice of an experienced academic health librarian. The authors adapted the strategy following a preliminary search of some potential keywords to ensure search specificity. For example, a preliminary search using the term “care transition” did not provide adequate breadth of results, and thus was replaced by the terms “discharge OR hospital”. The search strategy included the terms (or related terms) “integrated care”; gerontology (geriatrics, older adults, elderly); “discharge OR hospital” (with Boolean operators AND and * where relevant). The search plan was tailored to suit each database or search source. Details of the search strategies are available from the first author.

We searched the following electronic databases from January 1, 2005 to December 31, 2016 for documents written in French or English: Scopus (includes PubMed and EMBase), Proquest and EBSCOhost Full Text (includes 3,000 periodicals including AgeLine and CINAHL), and the University of Manitoba library One-Stop search feature (includes all physical items in the University of Manitoba Libraries, subscribed e-books, documents from over 200 databases, course reserve materials and subject guides). The One-Stop search feature was included to ensure breath of the search, since it searches all library database materials, not just health and social databases. The Journals of Integrated Care and the International Journal of Integrated Care were searched separately due to the high potential of relevant documents. For further grey literature searching, Google Advanced Search, and the Canadian Health Research Collection were used. Once documents were chosen for inclusion in the study, their reference lists were reviewed to search for additional studies.

3.3.3 Study selection

The selection of documents was completed in three main stages. See Figure 3.1. In stage 1, the first author screened the document titles to eliminate French versions of documents for which we had copies in English, and to eliminate documents that clearly did not meet the inclusion criteria (e.g. pediatric population). In stage 2, we independently determined the eligibility of documents based on the title and abstract, and then met to discuss and reconcile any differences. For grey literature with no abstract, we accessed the executive summaries or table of contents of the documents. In stage 3, we independently reviewed the full-text of documents that were potentially eligible following stage 2, and then again met to discuss and reconcile any differences regarding eligibility, which left 48 documents.

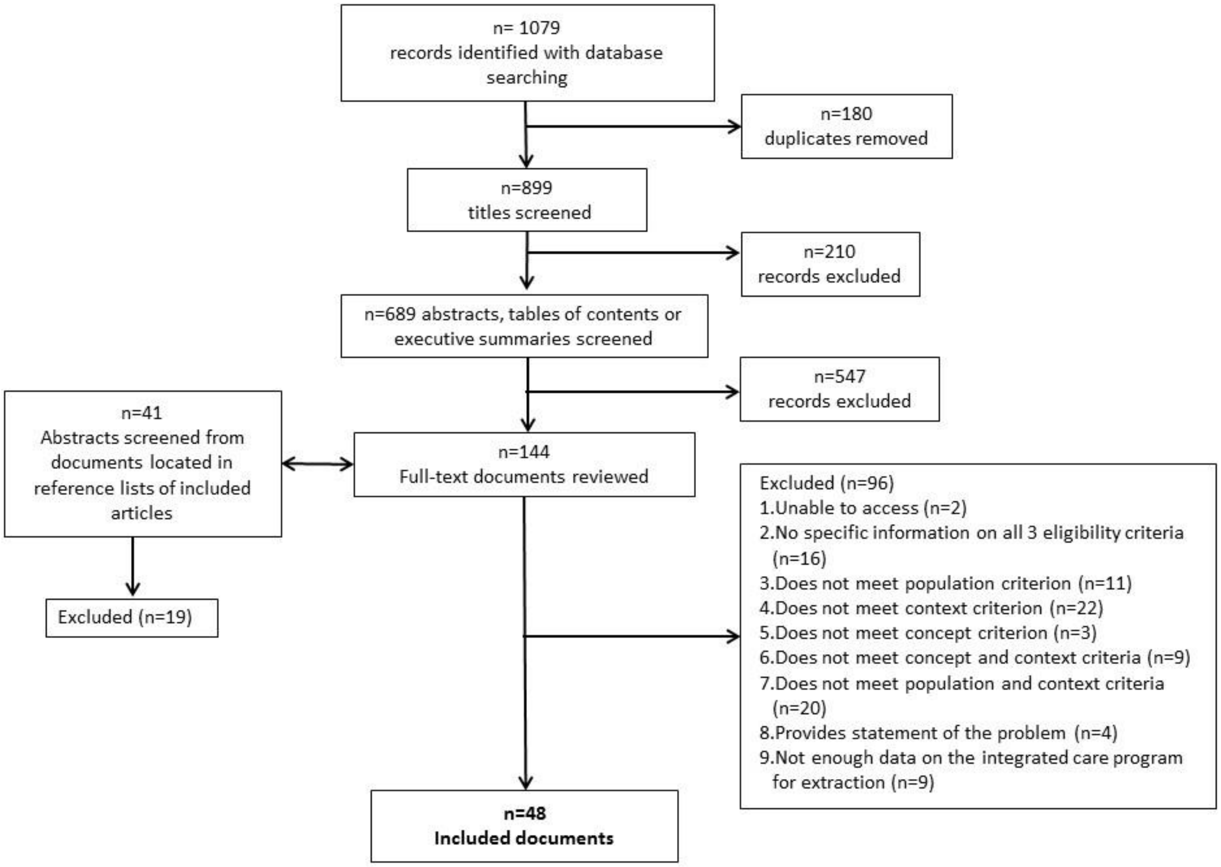

Figure 3.1: Document identification, screening and selection flow

3.3.4 Data extraction

For documents eligible for inclusion, data was abstracted by the first author and reviewed by the second author. First, basic information (e.g. publication date, document objective, document type, etc.) was abstracted from each included document. To accomplish this, the first author developed an extraction file based on a list of key information recommended for extraction by the Joanna Briggs institute (2015) and both authors met to revise the file after it was piloted on five documents. Next, we looked at the integrated care initiatives described in the documents. Several of the grey literature reports described multiple integrated care initiatives, but not all the initiatives met the inclusion criteria for this review. For example, documents may have described initiatives that were developed for different populations or that were not specific to care transitions. Thus, we reviewed all the initiatives reported within the included grey literature using our PCC inclusion criteria. The first author then extracted information on each initiative meeting the inclusion criteria so that the diversity of initiatives as well as literature types could be conveyed in the results.

In the final phase of data extraction, a content analysis approach was used to further address the study objective of determining how integrated care is being conceptualized in the literature. A qualitative approach was used to understand the phenomenon of integrated care from the perspectives of the authors of the documents (Vaismoradi, Turunen & Bondas, 2013). Content analysis allows for reporting of common trends and patterns in large amounts of text with a low level of interpretation and can allow for the quantification of qualitative information (Vaismoradi et al., 2013). Information about the features of each integrated care initiative was extracted, grouping text that was similar in meaning. An inductive approach was used, rather than attempting to fit the data into current frameworks of integrated care. However, knowledge of the Hollander and Prince (2007) and Kodner and Spreeuwenberg (2002) frameworks ensured that we considered multiple domains of integrated care (financial, administrative, clinical, etc.) We also occasionally referenced these frameworks to assist with the development of category labels.

When extracting data, we included all features of the initiative that would be (or were) in place during the implementation of the integrated care initiative. In some cases, this included features of the system or initiative that were already in place and were being kept in place during implementation of the integrated care initiative. As new information was extracted from different documents, similar information was grouped together. Following extraction of approximately 10 initiatives at a time, the information was looked at as a whole, categorized and labels applied to grouped data. This iterative process continued and the labels and categories continued to be altered as new data was incorporated into the emerging framework. Once data had been extracted from all the documents, we continued to collapse similar categories until we were left with three main groups of data containing categories and sub-categories that summarize the features of integrated care in this body of literature. Finally, we counted how many articles had information on each of the category features.

3.4 Results

3.4.1 Types of documents

There were a total of 25 peer-reviewed articles (19 with empirical results, four protocols, an editorial, and a program description), 22 grey literature documents (19 reports, 2 dissertations and 1 clinical care guideline), and one (1) non-peer-reviewed journal article. These 48 documents taken together described 45 different integrated care initiatives to support older adults transitioning from the hospital to the community. The initiatives were in various stages of implementation; 32 (71.1%) had been implemented, three (6.7%) were partially implemented, and nine (20.0%) were proposals or visioning documents. See Table 3.1 and 3.2 for details of the included documents.

The peer-reviewed research (n=19) was heterogeneous in terms of research design. There were six randomized controlled trials (RCTs), five qualitative studies, five prospective cohort studies, two mixed methods studies, and one quasi-experimental study. Of the four protocols, two were from the same study, with one protocol describing the intervention and the other the research design (quasi-experimental with nested RCT). The remaining two protocols described a RCT and a prospective matched control before and after study.

Of the grey literature (n=22), 19 were reports describing planned or implemented integrated care initiatives. Only one of the reports had an empirical approach and data reporting (mixed methods), the rest of the reports were descriptive in nature. The reports were most commonly authored by health authorities, health associations, or the health government branch (n=9). For the two dissertations, one was a process evaluation and the other a quasi-experimental study. See Figure 3.2.

Table 3.1 Peer-reviewed research reporting results

Study, Year Country of origin	Purpose	Design	Program Overview	Population#	Measures	Results/Key Findings*
Béland et al., 2006 Canada	Assess the System of Integrated Care (IC) for Older People (SIPA) model of delivery of health and social services.	Randomized controlled trial (RCT)	Community-based multidisciplinary teams that deliver community health and social services and coordinate institutional care.	Community-dwelling with moderate disability.	Primary: health utilization and costs. Secondary: health status; satisfaction with care; caregiver burden.	Program reduced alternative level of care (ALC) use by 50%; program cost neutral.
Wong, Chau, So, Tam & McGhee, 2012 Hong Kong	Empirical testing of the Health-Social Transitional Care Management Program (HSTCMP)	RCT	A primarily community-based health-social time-limited transitional care intervention.	Discharged home from medical unit.	Primary: readmission rate. Secondary: quality of life (QoL); self-efficacy; patient satisfaction.	Intervention group fared better for all outcomes except QoL.
Wong, Ho, Yeung, Tam & Chow, 2011 Hong Kong	Cost-effectiveness analysis of the HSTCMP.	RCT	As per Wong et al., 2012.	Discharged home from medical unit.	Primary: Health services utilization and costs. Secondary: QoL	No difference in length of stay (LoS) if readmitted. Cost savings with intervention.
Preen et al., 2005 Australia	Determine the effects of a hospital-coordinated discharge care plan.	RCT	A research nurse developed a discharge care plan, requested input from the GP on the plan, and faxed the plan to community providers.	Inpatients: primary diagnosis of chronic cardiorespiratory disease.	QoL; patient and GP satisfaction; hospital LoS.	Intervention group had better mental QoL; improved communication but not timeliness with GP's; limited increase in patient satisfaction.
Eklund, Wilhelmson, Gustafsson, Landahl & Dahlin-Ivanhogg, 2013 Sweden	Evaluate the "Continuum of Care for Frail Older People" intervention.	RCT	Provide support in emergency department, through hospital and after at home, by collaboration of hospital and community health care providers.	1 or more: chronic disease; ADL dependency	ADL; frailty	Intervention group had higher ADL independence but no differences in frailty.
Lee et al., 2015 Singapore	Evaluate the Transition Care Program.	RCT	A hospital-based multidisciplinary team provides post-hospital follow-up.	Inpatients with high risk of readmission.	Primary: readmissions. Secondary: ED visits; patient satisfaction	Intervention group had higher rates of satisfaction.

Casas et al. 2006 Spain and Belgium	Evaluate an standardized IC intervention for readmission prevention for chronic obstruction pulmonary disease (COPD).	Prospective cohort	Comprehensive assessment, self-management teaching, individualized care plan, access to specialist nurse post-discharge.	Patients with COPD who spent more than 48 hours in acute care.	Readmissions; number of healthcare visits; mortality.	Intervention group had lower readmission rates; otherwise no differences between groups.
Titova, Steinshamn, Indredavik, Henriksen, 2015 Norway	Compare the COPD-Home IC intervention with usual care.	Prospective cohort	Hospital discharge support via: 1) self-management education and plan, 2) hospital follow-up via telephone and home visits.	Admission to hospital due to COPD.	Health services utilization due to COPD.	Intervention group had a reduction in readmissions and hospital days.
Lin, Wang, Chang & Yang, 2005 Hong Kong	Examine the effectiveness of the IC and Discharge Support program.	Prospective cohort	Comprehensive geriatric assessment and discharge planning; intensive case management OR rapid intensive multidisciplinary support.	Inpatient returning to community-dwelling and at risk for readmission.	Primary: ED visits, readmissions, bed days, cost. Secondary: function and mental status.	Improvement in all outcomes improved except for mental status. Cost saving.
Doshi, Ramason, Azellarasi, Naidu, Chan 2014 Singapore	Describe integrated model of care developed for management of hip fractures.	Prospective cohort	IC pathway for hospital care facilitated by a care manager.	Hospitalized for hip fracture.	LoS; discharge destination; functional improvement	LoS reduced to below the national average. Most patients regained pre-morbid function.
Lyon, Miller & Pine, 2006 England	Determine if Castlefield's IC model of social and nursing services had an effect on hospital admissions.	Prospective	Social worker incorporated into a community health practice to work with community nursing.	One primary care practice patient population.	Caseload, referral patterns; timeliness of services provided.	Hospital discharge planning started sooner. Rates for admissions, LoS and bed occupancy fell with no impact on budget.
Asmus-Szepesi et al., 2015 Netherlands	Evaluate the effect and cost of the Prevention and Reactivation Care Program [PReCaP]).	Quasi-experimental	A geriatric rehabilitation program integrated across hospital, rehab and community settings to prevent functional decline.	Screened as at risk of functional decline.	Primary: ADL. Secondary: mortality; readmissions; falls; care costs; QoL; informal caregiver burden.	Intervention group had better perceived health status. No differences on other outcomes. Not cost-effective.

Holstege et al., 2015 Netherlands	Explore perceptions of health services professionals during implementation of a national integrated geriatric rehabilitation programme.	Mixed methods: Prospective	Each geriatric rehabilitation service improved care pathways to promote collaboration between settings (hospital, nursing facility, community care).	Staff, patients and informal caregivers from skilled nursing facilities.	Questionnaire on 4 domains of health care service delivery: alignment of care to patient needs; care coordination; team cooperation; quality of care. Interviews with process managers.	No changes noted post-intervention by patients/caregivers. Staff reported improved team cooperation, but less improvement in the other three domains.
Roland et al., 2012 England	Report outcomes for 6 IC pilots that used intensive case management as an intervention. The Church View program was relevant to this review.	Mixed methods: Questionnaire and health care utilization	Church View Program: Organizational integration of one GP practice with its local acute hospital and virtual ward model post-discharge.	Front line staff, patients of service.	Staff perceptions of changes in role and patient care; patient satisfaction; health care services utilization (ED admissions, elective admissions, outpatient care).	Increased communication between and with patients but patients felt had less personal choice. Reduction of health utilization with the exception of an increase in ED use. Overall cost-effective.
Masters, Halbert, Crotty & Cheney, 2008 Australia	Content analysis of 23 transitional care program self-evaluations.	Qualitative	Residential or community-based care at the end of an acute hospital episode for those that need time and support or restoration.	Hospitalized.	Compliance with key requirement of the program. E.g. timely access to care; care is linked to patient goals; documentation includes assessment of function.	Person-centred care evident; GP, pharmacist and geriatrician involvement in care planning was low; few programs had service agreements but those that did had better processes.
Baillie et al., 2014 England	Determine how a vertically integrated health system facilitates transition from acute hospital wards.	Qualitative	Vertical integration of acute and community hospitals, and community-based healthcare services.	Key staff in hospital and community; hospitalized patients.	Perceptions of 53 staff from both acute and community sites.	"The removal of organizational boundaries does not necessarily reduce boundaries between staff" p. 9.

Dahl, Steinsbekk, Jenssen, & Johnsen, 2014 Norway	Compare discharge to home directly from an acute care setting, to discharge to an intermediate care setting.	Qualitative	Intermediate care ward to improve discharge from acute care to primary care.	Front line and managerial staff from community, nursing home and hospital.	Perceptions of 27 health professionals and administrators.	Intermediate care provides a buffer between acute and community care but communication challenges persist.
Johannessen, Lurås, H., & Steihaug, 2013 Norway	Explore the role of an intermediate unit in the clinical pathway from hospital to home.	Qualitative	As per Dahl et al., 2014	Intermediate care unit patients; staff from hospital, intermediate care and community.	Perceptions of 30 health care professionals and 8 patients. Observation.	Challenges with communication and collaborative working exist due to lack of shared goals between settings.
Hjelmar, Hendriksen & Hansen, 2011 Denmark	Explore what affects motivation to participate in a cross-sectoral programme of post-hospitalisation follow-up visits.	Qualitative	Joint follow-up visit within one week of hospital discharge by the GP and primary care nurse.	Hospital staff, district nurses, project coordinator and ward physicians.	Perceptions of 23 health professionals.	Participants think the home visits are relevant, yet difficult to motivate GP’s to participate.

#All population groups were age 65 and over, or the population mean was 65 years of age or older.

*Only the results related specifically to acute to non-acute transitions are reported here.

Table 3.2 Characteristics of other documents included

Author, Year, Country	Document type	Document Purpose and Included Programs	Program Description(s)	Program Results/ Key messages
Strategy and Implementation Group for Nottingham South (SIGNS), nd England	Report by health authority	Describe the Nottingham IC model of health social services.	A "transfer to assess" initiative facilitates early discharge from hospital with comprehensive home supports.	Plan to measure patient-oriented outcomes in the future. Shared principles of care will guide implementation of new programs to address the needs of the frail elderly.
NHS Forth Valley, 2012 Scotland	Report by health authority	Propose a Care Village for service delivery across health and social organizations.	Integrate health and municipal social services as well as private housing services administratively and geographically.	No plan for evaluation outlined. This proposal provides a commercial, financial, and management argument for developing an "innovative intergenerational community" of integrated vertical and horizontal care.
NHS England, 2014 England	Report by health authority	Annual report of IC Pioneer programs.	N/A	Brief narrative descriptions of programs in 15 regions. Case study examples illustrate the scope of the initiatives.
		Kent	Integrated multidisciplinary teams provide discharge support and rapid response in community.	People with more complex conditions are remaining at home. Success is illustrated with case reviews.
		Hospital at Home (Norfolk)	Provision of in-home support to facilitate early discharge or prevent admission.	High rates of patient satisfaction; readmission rate to hospital of 5%.
Chia, Abraham, Seong,, & Cheah, 2012 Singapore	Editorial	Provide preliminary information of the Aged Care Transition (ACTION) team.	Care coordinators provide transition and post-hospital support with multidisciplinary in-home care for clients with higher acuity.	Intervention group had better transition experience than control group according to the Coleman's Care Transition Measure (CTM-15).
Altfeld Pavle, Rosenberg, & Shure, 2015 The United States	Non-peer reviewed journal	Describe the Bridge Model and present preliminary data.	A social work–based transitional care program providing pre-discharge planning and follow-up 30 day post-hospitalization.	High levels of satisfaction at 30 days. Rated positively by hospital and community staff including administration. Lower readmission rate with program than national average.
Thistlethwaite, 2011 England	Report by policy institute	Case study of the Torbay integrated health and social care model.	Vertical health integration as well as administrative integration of regional health services and municipal social services. Integrated health and social teams.	Program evaluation demonstrated that institutional health care service use had decreased. Community health and social care had increased. This integration effort required time to develop but had good results.

Author, Year, Country	**Document type**	**Document Purpose and Included Programs**	**Program Description(s)**	**Program Results/ Key messages**
Ontario Behavioral Support System Project Team, 2010 Canada	Report by charitable organization and health region.	Proposes a Behavioural Support System for a system of supports and services for adults with behavioural issues.	Coordinated, cross-agency, cross-sectoral collaboration and partnerships to facilitate seamless care for older adults with cognitive impairment and associated challenging behaviors.	This program aims to reduce the gaps in care for adults with behavioural issues. A series of actions to promote tailoring and adoption of best practices by local health authorities are outlined. Evaluation is planned for evaluating transitions from acute care.
Tate, 2015 England	Report by health authority	Request funding for development and testing of the Care of Elderly IC model.	A specialist in elderly care works closely with local hospitals and community teams to support return of the elderly to the community.	The proposed model aims to improve patient flow through the hospital, improve bed management across the region and improve the patient experience. It proposes analysis of health care use and satisfaction of care with already available data.
Future Hospital Commission, 2013 England	Report by professional organisation	Set out a vision for the Future Hospital that encourages integration across health professionals, within hospital services, and with community services.	New structure for hospital services that encourages integration across health professionals, services and hospital wards as well as provision of specialist care by hospital staff in the community.	The proposed model redesigns services for acute care needs and considers the need to interface with community and social services. Quality improvement using routine data collection is recommended.
Ontario Association of Community Care Access Centres, 2013 Canada	Report by health association	Explore health care programs that have the potential to be scaled-up in Ontario. Programs included in analysis:	N/A	For each model, "Lessons for Ontario" are provided. E.g. 1) A shared commitment to patient-centred care at home can improve discharge planning effectiveness; 2) Create data connectivity to connect care venues; 3) clearly identify the scope of services and responsibilities for care received.
		Home First (in Canada)	Through partnership between hospitals and community agencies, seniors are provided services to recover from hospital or wait for a nursing home bed at home.	192,344 people helped to return home in one fiscal year (2012/13). 50% of patients got home are within one day of referral.
		Intermountain Health (in the United States)	Coordination between hospital and a home and community care network of providers for hospital discharge.	Readmission rates in the lowest 3% of hospitals across the US.
		IC Model (in Barcelona)	Distributed care model with a case manger to coordinate services across and within health and social sectors.	Keystone of the program was a strong case manager. No program evaluation is reported.

Author, Year, Country	**Document type**	**Document Purpose and Included Programs**	**Program Description(s)**	**Program Results/ Key messages**
Joint Improvement Team, 2015 Scotland	Report by intersectoral committee	Describes 10 actions for organisations to improve hospital discharge. One program met inclusion criteria: The discharge hub.	A discharge hub will provide a single point of contact for communication, advice and education to streamline patient flow and discharge from hospital.	Ten ideas are provided in this document to reduce hospital discharge delays that are based on evidence from the literature and promising practices. No program evaluation is reported.
NHS West London Clinical Commissioning Group, 2015 England	Report by intersectoral committee	Describe a vision of whole systems IC that adds horizontal integration to existing vertical integration.	Extend existing models of vertical health integration to include all health and social care using a pooled capitated budget.	The process and implementation plan to improve care for those over 75 who require acute care is described. Evaluation of QoL, quality of care, and health utilization data is planned.
Baird Kanaan, 2009 The United States	Report by research-policy institute.	Describe 9 case studies to illustrate how to reduce hospital readmissions.	N/A	Evaluation is reported individually for each program. Common features to successful programs are patient-centred care, locally tailored solutions, a supportive environment and, incentives.
		Care Coordination Network (Summa Health System)	Streamline transitions from hospital to nursing facility by development of standardized communication tools and information technology.	Reduced hospital readmission rates, lengths of stay and cancellations of tests and surgeries.
		HealthCare Partners Medical Group	Stratification to determine needed disease-related management/self-management interventions.	Reduction in readmissions and total cost of care.
Hounslow and Richmond Community HealthCare NHS Trust, 2013 England	Report by health region and council.	Determine feasibility of integrating community health and social care in Hounslow and Richmond.	Proposes complete integration of community health service and social services. Includes a hospital discharge pathway as an essential program.	This report provides the estimated costs and benefits of a new integrated organisation. The next step is the development of a robust business case.
Williams, 2015 England	Report by health region and council.	Update the board on development of an IC Pathway for Older People in Glascow.	Package of services and system improvements to increase timely discharge from acute care with emphasis on intermediate care.	Delayed discharges have reduced by 49%; bed days lost has reduced by 41%. Next steps include developing intermediate care wards.

Author, Year, Country	Document type	Document Purpose and Included Programs	Program Description(s)	Program Results/ Key messages
Snowdon & Cohen, 2011 Canada	Research/ policy institute	Examine how 7 comparator countries are working to redesign health systems. Included program: Unique Care Team (England)	Case management approach of coordinating community health and social care for those going home from hospital.	Reduction in bed days that is projected to provide savings of 300,000 pounds per year.
Cunnane, 2013 England	Report by health authority	Share practices from Denmark and Sweden to facilitate integration activities in England. Included program: The Esther Project (Sweden).	Case study used to motivate the development of clinical integration to facilitate reduced hospital use.	Reductions for admissions delays and waiting times for specialists. Process of imagining care from patient perspective allowed for design of services to meet care gaps.
Walker, 2011 Canada	Report by government	Recommend how to address alternate level of care in Ontario. Included program: Toronto Central Virtual Ward Pilot.	Short period of high intensity care provided at home post-hospitalisation for those with complex care needs.	Early evidence indicates that the program is successfully stabilizing high-risk patients without hospital care but no specific outcome data is provided.
O'Sullivan, 2014 Ireland	Dissertation: program evaluation	Describe the implementation and evaluation of a protocol for transitional care.	A protocol assists with coordination of care to implement a home-based interim home support program following hospitalization.	Only those who helped develop the protocol had high knowledge and satisfaction with it.
British Columbia (BC) Provincial Seniors Hospital Care Working Group, 2012a Canada	Clinical Care Guideline	Direct senior care by describing the 48/6 Model of Care.	"IC initiative that addresses six care areas of functioning through patient screening, assessment" and care planning. (p. 1)	A process for developing a care plan and transition plan that addresses the six areas of function in order to improve health outcomes and reduce readmissions is outlined.
BC Seniors Provincial Hospital Care Working Group, 2012b Canada	Report by health authority	Describe in brief the 48/6 model of care and planned evaluation.	As per BC Seniors Hospital Care Working Group, 2012a	Plan to evaluate compliance with screening and care plan development for six functions.

Author, Year, Country	**Document type**	**Document Purpose and Included Programs**	**Program Description(s)**	**Program Results/ Key messages**
Asmus-Szepesi et al., 2011 Nertherlands	Journal article	Protocol: Evaluation study of the PReCaP.	As per Asmus-Szepesi et al., 2015	Provides data on a pilot evaluation of the triage instrument to justify sample size and evaluate logistics.
Asmus-Szepesi, 2015 Netherland	Dissertation (quasi-experimental)	Describes and evaluates the PReCaP.	As per Asmus-Szepesi et al., 2015	See Asmus-Szepesi et al., 2015
de Vos et al., 2012 Netherlands	Journal article	Protocol: Description of the PReCaP intervention.	As per Asmus-Szepesi et al., 2015	Planned evaluation of: Effect (physical function, functional decline risk factors, QoL, caregiver burden); process evaluation; intervention fidelity.
Department of Health, 2009 England	Report by government	Provide an overview of the IC Pilots Programme and Evaluation with summaries of the 16 pilots.	N/A	Provides an introduction to the pilot program and a brief summary of planned evaluation of the program.
		Torbay	Integrate health settings and services to enhance hospital discharge planning.	Institutional and residential health care service use has decreased. Community health and social care has increased.
		Church View Medical Practice	Organizational integration of one GP practice with its local hospital and virtual ward model post-discharge.	See Roland et al., 2012
RAND Europe, 2012 England	Report by research institute	Provide evaluation of the IC Pilots. Included programs: as per Department of Health, 2009.	As per Department of Health, 2009.	As per Department of Health, 2009.
Bäck & Calltorp, 2015 Sweden	Peer-reviewed journal article.	Describe the Norrtaelje model of integrated health and social care in Sweden.	This model includes: 1) funding responsibilities for a single population; 2) focus on population health promotion; and, 3) a common health and social care organization.	Costs were lower than other municipalities; tools were used to effectively pool and redistribute funds; increased number of people with a geriatrician, lower waits for nursing home.
Buurman Parlevliet, van Deelen, de Hann, & de Rooij, 2010 Netherlands	Peer-reviewed journal article	Protocol: RCT to determine the effect of a pro-active, multi-component, nurse-led transitional care program.	Standardized handover process from hospital to community and community follow-up via home visits.	Evaluation not yet completed. Planned outcomes: Primary: ADL. Secondary: mortality; cognition; QoL; caregiver burden; patient and caregiver satisfaction; health care utilization. Qualitative data re: feasibility.

Author, Year, Country	Document type	Document Purpose and Included Programs	Program Description(s)	Program Results/ Key messages
Bergmo, Berntsen, Dalbakk & Rumpsfeld, 2015 Norway	Peer-reviewed journal article	Protocol: Describe the Patient-Centred Team (PACT) model and design for an effectiveness and cost-effectiveness study.	Interdisciplinary teams of both hospital and community staff that facilitate transition from hospital to community including hospital follow-up.	Evaluation not yet completed. Planned outcomes: Primary: QoL, physical health (SF36). Secondary: other dimensions of SF36; health resource use; patient perception of health and service; health self-efficacy; cost utility.

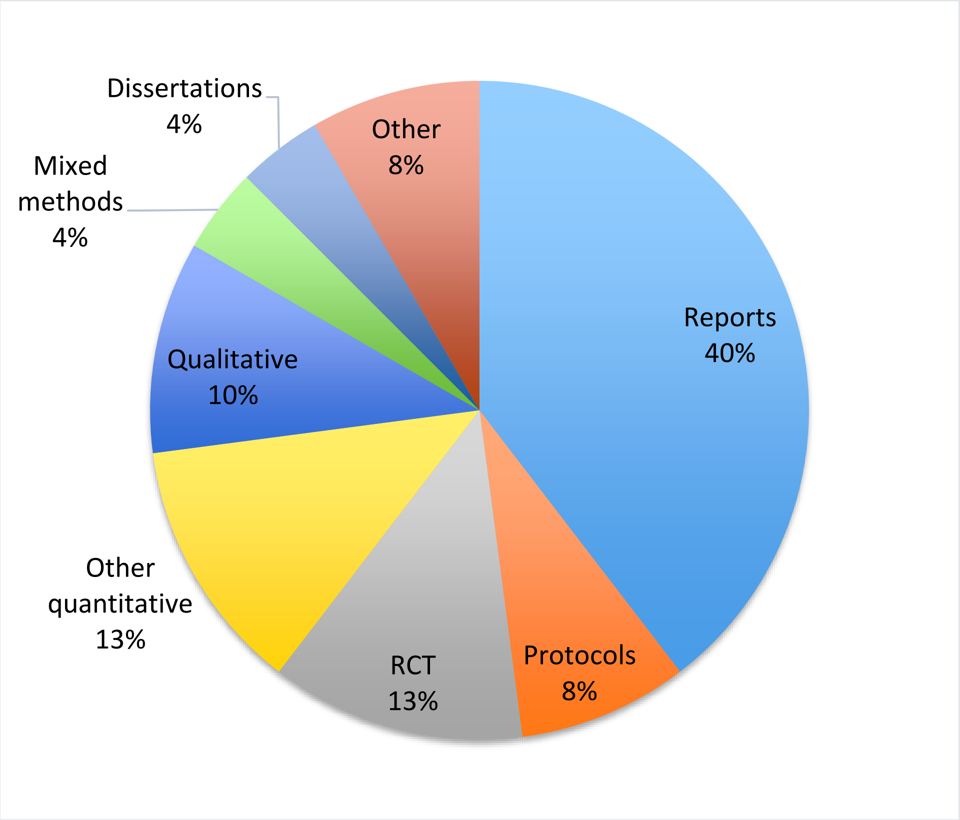

Figure 3.2. Types of documents

The documents came from 14 different countries in four continents (Europe, North America, Asia and Australia) with the majority originating from Europe (31; 64.6%). In order of most to least documents produced, documents were from England (14; 29.2%), Canada (7; 14.6%), The Netherlands (6; 12.5%), Norway, (4; 8.3%), Hong Kong (3; 6.3%), Singapore (3; 6.3%), two documents each (4.2%) from Australia, Sweden, Scotland, and The United States and one document each (2.1%) from Spain, Demark and Ireland. The initiatives described in the documents were generally from the same 14 countries, although some documents reported on initiatives in other countries, and some initiatives were described in more than one document.

For example, there were six documents and two initiatives from The Netherlands, and two documents and four initiatives from the United States.

According to the publication year, this topic is becoming more popular, with the number of documents increasing over the last 10 years. Nine of the documents were released between 2005 and 2010 (18.8%), while the remaining 39 were released between 2011 and 2015 (81.3%). The year with the most documents released was 2015 (13; 27.1%).

3.4.2 Outcomes measured

In the quantitative research from peer-reviewed publications (n=14; 8 RCT's and 6 non-RCT's), the most commonly measured outcome was health utilization, with the most frequent indicators being hospital readmissions (n=9 studies), and hospital length of stay (n=7 studies). Other health utilization measures included emergency department visits and outpatient visits (n=7 studies). Health and function indicators were used in seven studies, health care costs in five studies, patient satisfaction of care in five studies, quality of life of the patient or informal caregivers in four studies, service provider perspectives of care, and health care costs in three studies. See Figure 3 for a summary of outcomes reported from quantitative instruments. The qualitative studies involved thematic analysis of interviews, focus groups, or narrative documents and thus outcomes were not extracted for these studies, and are not included in Figure 3.3. All seven of the studies that analyzed qualitative data explored perceptions of staff on the implementation of an integrated care initiative, and two of the seven also explored patient perceptions of their care transition experience.

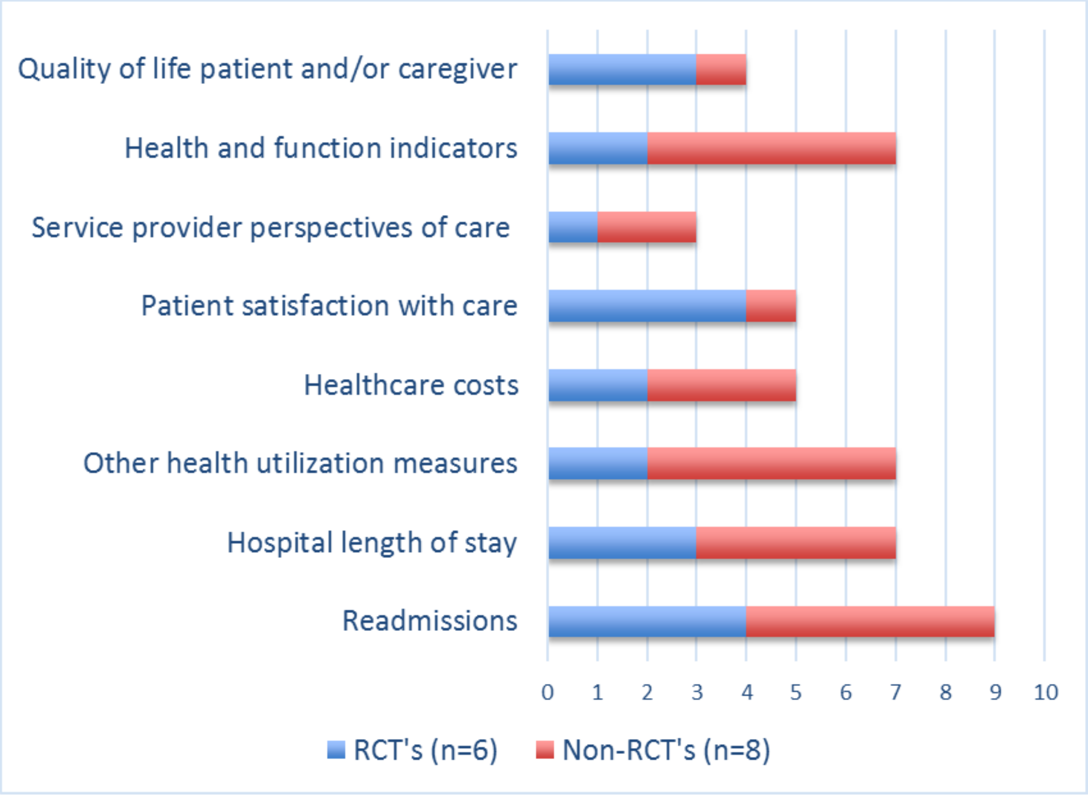

Figure 3.3. Outcomes measured in quantitative peer-reviewed literature

3.4.3 Patient populations

The patient population in the peer-reviewed quantitative research was also variable. Of those reporting specific enrolment criteria (n=11 of 14 studies), some studies included only older adults with specific health conditions (COPD, n=2; hip fracture, n=1; chronic cardiorespiratory disease, n=1), while others included all hospitalized older adults (n=4). Some studies focused on older adults considered to be vulnerable to hospitalization due to existing disability (n=2), or older adults at risk of readmission according to screening tools (n=2).

3.4.4 Conceptualization of integrated care

To determine how integrated care was conceptualized in this body of literature, we first tracked the terminology related to the word *integrate* in all of the documents to explore consistency in the use of this term. In the 48 documents, there were 37 different uses of language or terminology for integrated care or integration. The four most common were: integrated health and social care (or services) (11.1% of the tracked terms), integrated care (9.9%), integrated care model (7.4%) and service integration (6.2%).

The next step in conceptualizing integrated care was to track how the documents defined integrated care. Ten of the 48 documents provided explicit definitions of integrated care (20.8%). All of the definitions referred to improving partnerships or coordination of care, with most referring specifically to coordination and partnerships across different health and/or social care settings and/or services. Thirteen (27.1%) of the documents did not provide an explicit definition, but the characterization of integrated care was evident from the description of the goals of care. Seven of these 13 documents characterized integrated care by describing locally developed or adopted models of integrated care, while six of these 13 documents were aiming to reduce the absence of integration (such as system fragmentation, a lack of coordination, or siloed care). Finally, more than half (25; 52.1%) of the documents provided no definition or characterization of integrated care.

Another approach we took to understanding how integrated care is being conceptualized was to track the breadth of the initiatives. The narrowest application of integration was within-hospital integration, whereby the goal of the integration was to improve coordination, communication and care pathways within the hospital setting. This was the least common approach, with only two articles describing this type of integrated care (British Columbia Provincial Seniors Hospital Care Working Group, 2012a; Joint Improvement Team, 2015). Vertical integration of health services was the second most common type of integrated care described, with 17 of the 45 initiatives (37.8%) aiming to integrate inpatient hospital services and at least one other level of care. Of these initiatives, the most common approach to integration was to integrate inpatient hospital care and primary care (10 initiatives; 22.2%). Other approaches included linking inpatient hospital services with inpatient rehabilitation initiatives, the emergency department, GPs, and/or nursing homes. Initiatives that aimed for both horizontal integration of community health and social initiatives, and vertical health services integration were most common (26 of 45 initiatives; 57.8%). These initiatives had the most breadth of service inclusion, for example including palliative care, ambulance services, geriatric day centres, and mental health services in addition to hospital care and health and social community care. The broadest vision of integrated care was a proposal by National Health Services (NHS) Forth Valley (2012) for whole system integration of the health, social, housing, education and voluntary sectors.

The last way we synthesized data to understand how integrated care was being conceptualized was by categorizing the features of the integrated care initiatives to determine commonalities. See Table 3.3 for feature definitions and Table 3.4 for results. Three overarching categories of features were identified: philosophy and policy, clinical features, and administrative and operational features. The category of *philosophy and policy* was defined as information that conveys the underlying beliefs or attitudes embodied in the initiative. All the initiatives stated their goals. The most common goal was to make most efficient use of health care resources by minimizing hospital lengths of stay, reducing hospital readmissions and supporting older adults in the community (66.7% of initiatives). The second, third and fourth most commonly reported goals had similar frequency rates: enhancing coordination (42.2%), being patient-centered (40.0%) and improving health outcomes (35.6%). Almost a quarter (24.4%) of the initiatives identified stakeholder engagement as an important part of their development and feedback mechanisms, reflecting a dedication to sustainable decision-making.

Another quarter of the initiatives (24.4%) identified the importance of the development of a shared inter-agency culture or model of care to promote quality care provision. These categories were not mutually exclusive. For example, two initiatives used fictitious older adult exemplars to engage administration and staff across health settings and services in the development of solutions to care barriers (Cunnane, 2013; Thistethwaite, 2011). The pseudopatient was given a name, and depicted with a written case story and image, to help health professionals "look through the eyes of the patient" in developing patient-centered care solutions that transcended care boundaries.

Table 3.3. Definitions of features of integrated care programs categories

Main Categories	Definitions
Philosophy	Information that conveys underlying beliefs/attitudes embodied in the program or intervention.
Overarching program goals and/or principles	The stated intentions of the program/intervention. Conveyed as aims, goals, principles or objectives.
Stakeholder engagement	Involvement of stakeholders in designing or evaluating the program or intervention.
Cross-agency shared culture/Model of care	Development, selection, or intention to develop shared objectives or model of care to guide delivery of high quality care.
Clinical Features	Elements or components of the program/intervention that are related to clinical care. There was no effort to judge whether or not the element was consistent with integrated care, they were extracted and categorized at face value.
Strategies for care coordination between care settings	Specific activities to help align and/or coordinate patient care provided between agencies or sectors.
Individual care coordination	An individual or team is assigned to each patient to coordinate the older adult's care. A case manager provides health professional care in addition to care coordination.
Multidisciplinary teams	A team that includes at least two different professional backgrounds cares for the older adult.
Post-hospitalization support	Support services provided immediately after hospital discharge to prevent readmissions/improve care transition success.
Assessment	A clinical assessment of the older adult.
Patient/family/caregiver involvement	Inclusion of the older adult and/or family members in care by providing communication, education and/or support.
Strategies for care coordination within one setting	Specific activities to help align and/or coordinate patient care within one agency.
Individualized care plan	A care plan is developed for the older adult as a part of the intervention or program that is specific to his or her needs.
Case-finding model	Systematic search for people that would benefit from the program or intervention.
Service outside of office hours	Service is provided evenings, nights and/or weekends.

Clinical accountability	One individual or a clearly defined group of people is designated as ultimately responsible for the client's needs being met.
Single/coordinated program entry	Admission into the program/intervention is streamlined though one professional, one group of professionals or one agency.
Administrative and Operational Features	Elements of the program/intervention that are not related to clinical care.
Organizational/Administrative integration	There is in place, or there is planning to share the activities and duties required to plan and direct the program/intervention across agencies, sectors or professional groups.
Financial integration	There is some type of sharing of funds across agencies, or sectors.
Strategies to promote organizational integration	Activities that are undertaken to help align and/or coordinate the services provided within or between agencies or sectors.
Operational/Management integration	Activities are in shared to run the day-to-day functions of the program or intervention by more than one agency, sector or professional group.
Integrated information technology	Activities are in place, or are planned, for computer systems that allow for sharing and storing information across more than one agency, sector or professional group.
Cross-agency training and education for service providers	Professional education delivered to multi-professional, multi-agency and/or multi-sector groups. Or, education that promotes interprofessional and/or inter-agency learning.
Continual quality improvement	Mechanisms are in place, or are planned, to ensure quality improvement in care delivery. Does not include study outcomes if there is no clear indication of how the outcomes will be used for quality improvement.
Integrated governance	Indication of a governing body that has jurisdiction over more than one agency or group.

Table 3.4. Features of integrated care programs aiming to improve care transitions between hospital and community for older adults (n=45 programs)

Categories and Sub-Categories	Illustrative Example(s)	# of programs (%)
Program Philosophy and Policy		**45 (100.0)**
Stated principles and/or goals of initiative		*45 (100)*
Streamlined/reduced institutional health use	Reduce hospital readmissions, length of stay and unnecessary transfers to nursing home; keep care closer to home.	30 (66.7)
Coordination, collaboration, communication	Team collaboration; inter-sectoral collaboration; coordinated care pathways; communication between primary and secondary care.	19 (42.2)
Patient-centred	Put the citizen at the centre of care; increase patient involvement; adhere to a patient-centred model.	18 (40.0)
Improved health outcomes	Optimize client health and function; apply preventative care to reduce long-term needs.	16 (35.6)
Timely and responsive care	More responsive system; rapidly meet needs; shorten time from assessment to delivery of services.	9 (20.0)
Efficiency	More efficient assessment; full utilization of health and social resources.	8 (17.8)
Safety	Ensure safe hospital discharge; safeguard from risk.	8 (17.8)
Accessible	Improve access to care and services; equitable services; easy access to services.	7 (15.6)
Comprehensiveness	Provide more services in the home; comprehensive assessment.	5 (11.1)
Stakeholder engagement in planning and evaluation	Elderly, caregivers, senior management team, direct service providers, advocacy organizations, voluntary sector and/or government involved in planning and/or implementation.	*11 (24.4)*
Development, use, or recognition of need for a cross-agency shared culture/Model of care	Use of a shared culture and objectives to motivate staff to provide high quality care; model development to show how all services interact.	*11 (24.4.)*
Clinical Features		**45 (100.0)**
Strategies for care coordination between care settings		*32 (71.1)*

Categories and Sub-Categories	Illustrative Example(s)	# of programs (%)
Standardized procedures for transferring written client information from one setting to another	Discharge plan faxed to all community providers; required elements for hospital discharge documentation; discharge letter sent to GP within 3 days; electronic forms.	13 (28.9)
Development and use of protocols and/or pathways	Shared protocols between health and social services; protocol to facilitate hospital and community communication; referral pathways.	13 (28.9)
Staff spans boundaries between hospital and community to provide services	Hospital in-reach where community-based staff provides service within the hospital; hospital out-reach where hospital staff provide service in the community.	13 (28.9)
Pre-discharge appointment/service scheduling	GP appointment scheduled prior to discharge; community nurse mobilizes community support prior to discharge.	9 (20.0)
Inter-agency patient care communication	GP's and community staff dial-in to hospital for case conferences; discharge plan sent to GP prior to discharge for review/alterations.	8 (17.8)
Individual care coordination		*23 (51.1)*
Care coordinators	System navigators; coordinators with no health or social training; patient flow coordinator; link nurses.	11 (24.4)
Case management (coordinates and provides health professional care).	Following the patient actively through care trajectory and intervening on medical and social issues; complex case management program; ensure compliance with care.	14 (31.1)
Multidisciplinary teams		*23 (51.1)*
Crosses agency or sector boundaries to provide care across settings	Multidisciplinary team providing care across institutional and community settings; multi-agency team.	8 (17.8)
Specific to one care setting	Inpatient multidisciplinary teams; primary care geriatric consultancy team; intermediate care team.	15 (33.3)
Post-hospitalization support strategies		*22 (48.9)*
Home visit(s)	GP home visit within 3 days of discharge; home visit by primary care nurse within 1 week of discharge; trained social support volunteer visits.	10 (15.6)

Categories and Sub-Categories	Illustrative Example(s)	# of programs (%)
Other/unspecified post-hospitalization support	Volunteers assist patients when they initially arrive home from hospital; social care installs needed equipment; early specialist clinic follow-up; pharmacist session within 5 days of discharge; GP follow-up in clinic	10 (22.2)
Telephone follow-up	Case manager provides health advice; monthly calls over 2 year period; check-up 1 month post-discharge.	7 (15.6)
Assessment of long-term needs in the home following early discharge	Temporary home support for 2 weeks until assessment of long-term needs can be made; discharge within 72 hours rather than assessing long-term needs in hospital.	5 (11.1)
Assessment		*20 (44.4)*
Multi-domain/Joint health and social assessment	Comprehensive geriatric assessment; assessment of social, health and care needs at once.	10 (22.2)
Assessment of discharge needs	Assessment of post-hospital health, social and care needs.	12 (26.7)
Patient/family/caregiver involvement		*16 (35.6)*
Communication/support	Health goal-setting; involvement in care plan development; family conference; advance care planning.	12 (26.7)
Education	Education regarding discharge plans and services; disease specific education; self-management education.	7 (15.6)
Strategies for care coordination within one setting		*15 (33.3)*
Regular multidisciplinary meetings	Weekly case reviews; daily hospital rounds.	9 (20.0)
Development and use of protocols and/or pathways	Evidence-based interdisciplinary protocol for common geriatric conditions; ward checklists for discharge planning; hip fracture care pathway.	5 (11.1)
Other	Toolkit for developing care plans; guide for post-hospital visits; patient information tools; all interdisciplinary information in one care plan.	5 (11.1)
Individualized care plan	Care plan for post-discharge; joint health and social care plan; patient goal care plan; multidisciplinary plan.	*13 (28.9)*
Case-finding model	Risk stratification; screening for	*12 (26.7)*

Categories and Sub-Categories	Illustrative Example(s)	# of programs (%)
	functional decline, need for community services or risk for readmission.	
Service outside of typical office hours	Seven-day service, out-of-hours urgent response team.	*10 (22.2)*
Clinical accountability	A nurse is in charge of the admission and discharge decisions; community-based team has full responsibility for community care and coordinating acute care needs.	*8 (17.8)*
Single/coordinated program entry	Community hub provides a single point of access for care needs; integrated collaborative intake; all referrals directed through a coordinator.	*6 (13.1)*
Administrative and Operational Features		**34 (75.6)***
Organizational/ Administrative integration		*20 (58.8)*
Integration of vertical and horizontal organizational structures	Merging of posts of chief executive of health and adult social services; administrative structure that executes policy and mission of health and social services.	11 (24.4)
Integration of vertical health organizational structures	Vertical administrative integration of health services; organizational integration of a GP practice and an acute care hospital.	9 (20.0)
Financial integration		*19 (55.8)*
Sharing/pooling budget for health and social care	Shared funding envelope for health and social care by city council and health region; integrated health and social commissioning	7 (20.6)
Other fund sharing model	Aging agencies grouped together to get grant funding for a transitional care program; capitation; single funding envelope for vertical and horizontal integration	7 (20.6)
Sharing/pooling budgets for vertical health integration	Fund pooling for hospital and community specialist care; funding bundle for geriatric rehabilitation services; health services organized by region rather than service	5 (14.7)
Strategies to promote organizational integration		*16 (47.1)*

Categories and Sub-Categories	Illustrative Example(s)	# of programs (%)
Formal service/business agreements	Signed contract of agreement between health agencies for admission criteria; service provision agreement with partner organization; clarification of roles and responsibilities in legal formal agreement.	10 (29.4)
Co-location of staff	Co-location of health and social teams in the community; co-location of community providers in hospital; creation of care hubs; care organized by geographical zones.	10 (29.4)
Inter-agency communication and/or working groups	Meetings between managers and professionals from hospital, primary care and home care; task force with representation from multiple disciplines and facilities.	5 (14.7)
Operational/ Management integration		*13 (38.2)*
For vertical and horizontal integration	Joint management of health and social services; integrated social and health service commissioning	7 (20.6)
For vertical health integration	Group staff model; operational merging of hospital and community health services	6 (17.6)
Integrated information technology	Shared records for clinical care; service utilization tracking to determine patient census and availability of community care.	*13 (38.2)*
Cross-agency training and education for service providers	Regional education sessions for disease-specific care; on-the-job training in different settings; regular rotation through different care settings.	*12 (35.3)*
Evaluation for quality improvement	Cycle of continuous quality improvement; preliminary process outcomes provided to service organizations for process improvement; monitor results to inform future operational activity.	*12 (35.3)*
Integrated governance	Joint political governing committee; overall project board; steering committee responsible for development of inter-sectoral plan.	*9 (26.5)*

*proportions for the features in the *Administrative and Operational Features* category are derived from the total number of programs that provided description of administrative and organizational features (n=34).

The second overarching category was *clinical features* of the initiatives, defined as elements of the initiative that are related to direct clinical care. All 45 initiatives provided at least one detail about their clinical components. The descriptions were typically comprehensive and detailed allowing for the development of several sub-categories. Consistent with the finding that most of the initiatives were aiming for horizontal, or horizontal and vertical integration, 71.1 per cent of the initiatives described specific strategies that were in use, or were planned, to ensure care coordination across care settings. The other clinical features for which there was the most consensus were: individual care coordination (51.1% of initiatives), multidisciplinary teams (51.1% of initiatives), post-hospitalization care support (48.9% of initiatives), and individualized comprehensive assessment (44.4%).

The final overarching category was *administrative and operational features* of the initiatives, defined as elements that were not directly related to clinical care. Details on these features were more difficult to extract than the clinical features because the administrative structure was often not described. When possible, we used supplementary information from health region websites to determine the administrative and operational structure of organizations named in the articles. For example, several articles from England identified the use of clinical commissioning groups (CCG's) that organize the delivery of several levels of health care. Three quarters (75.6% or 34) of the initiatives identified at least one administrative or operational feature of the initiative. For the remaining one quarter, the description did not include the operation of the initiative or health system, making it unclear whether or not these initiatives have autonomous administrative structures. One exception was an initiative that was deliberately avoiding macro level integration (Cunnane, 2013). Since it was the only article describing this approach, it was not included in the article count for Table 3.4.

The most common features for *administrative and operational features* were administrative or organizational integration (20 of the 34 initiatives; 58.8%), financial integration (55.8%), and specific strategies to promote organizational integration (47.1%). Administrative integration was most typically in the form of system-wide horizontal or vertical mergers. In fewer cases, the administrative structure was developed for a specific initiative. For example, for the implementation of a Transitional Care Bridge Model in the United States, an administrator worked across sites to implement the initiative (Altfeld, Pavle, Rosenberg & Shure, 2012). Financial integration was most typically described as some type of fund sharing structure, either vertically or horizontally, although other types of fund sharing were described, such as agencies working together to secure grant funding.

3.5 Discussion

The results of this scoping review indicate a very heterogeneous literature base for the topic of integrated care approaches to care transitions for older adults. The literature was heterogeneous both in terms of the types of documents, as well as how the documents applied the concept of integrated care. The literature ranged from unpublished clinical guidelines to randomized controlled trials. The integrated care initiatives ranged from efforts to coordinate services within the hospital, to comprehensive systems of vertically and horizontally integrated social and health care. That there were numerous grey literature documents indicates that the published peer-reviewed literature provides a narrow view of international developments in integrated care initiatives for care transitions.

One objective of conducting a scoping review is to determine if there is an adequate literature base to conduct a systematic review or meta-analysis (Levac et al., 2010). There were 11 quantitative studies included in this review, but the heterogeneity in population and outcomes would make them difficult to synthesize. Particularly notable was that different approaches to measuring outcomes were used. Integrated care goals are often two-pronged, with efforts to enhance both patient and system efficiency outcomes; therefore it is not surprising that the outcomes in these documents are variable in approach and perspective. However, the lack of gold standard for measuring the success of integrated care in improving care transitions is perpetuating variability in outcome measurement. Most articles in this study focused on reducing institutional health care use as a desired outcome of improved care transitions, with health and function outcomes being less commonly measured. Outcome measurement in this body of literature had little emphasis on the patient perspective compared to the service perspective, which is inconsistent with the goals purported by these initiatives.

Another challenge for interpreting the quantitative literature is the lack of appraisal of whether the integration goals were achieved, making it difficult to determine the extent of the influence of integration on outcomes. The qualitative literature included in this review revealed challenges with the implementation of integrated care initiatives. For example, Hjelmar, Hendriksen & Hansen (2011) describe how an attempted collaboration between hospital and primary care had difficulty eliciting cooperation for the initiative from the community GPs. Further, documenting the success of initiatives in promoting integration is important because integrated care success may be more dependent on the consistency between the macro and micro environment (administration and front line staff) than the type of initiative (Calciolari & Ilinca, 2011).

Previous authors have pointed out the lack of standardized, validated tools for evaluating to what extent care is integrated. A systematic review of integrated care delivery and services found only three tools that measure the extent of integration (Armitage, Suter, Oelke & Adair, 2009), and a recently published protocol also aims to address this gap by developing an inventory of indicators for assessing achievement of an integrated system (Oelke, Suter, da Silva Lima, & Van Vliet-Brown, 2015). The proposed scoping review by Oelke and colleagues (2015) addresses a sorely needed area of research. We also recommend an inventory of tools that evaluate the patients' perception of care integration. The patient perspective is notably absent from the inventory compiled by Armitage and colleagues (2009) and is not explicitly addressed in the protocol by Oelke and colleagues (2015). Incorporating the patient voice into this research is important, as despite the lack of consistency in the definition of integrated care, there is consistency in the view that integrated care requires a patient-centred focus (Hollander & Prince, 2007; Kodner & Spreeuwenberg, 2002; WHO, 2015). The National Voices in England developed a document that provides narrative statements that could be used for developing integrated care indicators. For example, statements that specifically relate to transitions include "When I use a new service, my care plan is known in advance and respected" (National Voices, n.d.).

The second main objective of this review was to determine how the concept of integrated care is being applied in the literature on care transitions. While at least half of the documents in this review did not describe their conceptualization of integrated care, analysis of the initiatives determined that there were three broad applications of integrated care: integration of services within the hospital, vertical integration of health services, and vertical health as well as community horizontal integration. The majority of the documents viewed integrated care as a strategy to use across organizational boundaries, rather than a strategy to apply within an organization, as two of the articles focused only on within-hospital integration. More than half of the initiatives aimed to integrate community health and social services, indicating that robust community supports beyond health are believed to be important for supporting older adults post-hospitalization.

In terms of the features of the initiatives, many were consistent with integrated care frameworks, such as having shared values, integrated information systems, jointly managed programs, and co-location (Hollander & Prince, 2007; Kodner & Spreeuwenberg, 2002). However, we expected more documents to describe patient and family involvement (more than 35.6%) due to the consistent focus of patient-centred care in integrated care frameworks (Hollander & Prince, 2007; Kodner & Spreeuwenberg, 2002). Some of the features were more consistent with care coordination rather than integration, for example, scheduling follow-up appointments prior to hospital discharge, or ensuring written information is provided to the community by the hospital in a timely and standardized fashion (Leutz, 1999). Further, some features may or may not have been in the spirit of integrated care depending on how they were operationalized. For example, when developing the category of patient and family involvement, we included all references to family and patient communication and support without judging the quality of the proposed interactions. Some of the interactions were consistent with the spirit of integrated care in that they involved patient and family input into decision-making and goal-setting, whereas for other initiatives it was simply stated that information would be provided to families and patients. It is well recognized that depending on the setting and context, coordination or linkage may be a more realistic goal than full integration (Leutz, 1999), however none of the programs explicitly identified the extent of integration that they hoped to achieve.

The analysis of features of initiatives in this review confirms that similar to the larger body of literature on integrated care, micro level clinical and service delivery integration is being targeted rather than macro level integration of funding, administration and/or organization (Kodner & Spreeuwenberg, 2002). Because there was a higher level of description of clinical features of programs, we were able to ascertain more consensus of what clinical level integration entails for care transitions for older adults than administrative integration. There were three specific clinical features that were included in more than 50 per cent of the initiatives, but for macro strategies, we were not able to achieve this level of specificity.

A broader description of macro levels of integration is required for integrated care comparison. It may be that the focus on micro clinical integration in this literature was reflective of the scope of the integration initiatives. However, different health regions and different countries will have varying levels of integration inherent in their health system infrastructure. Thus, in order to compare integrated care initiatives across regions and countries, a full understanding of integration across both the macro and micro domains is needed to truly understand the context of the initiative. This is particularly important considering the international scope of this literature. Further, it has previously been noted that integration at a macro level does not automatically lead to integration at the micro level (Baillie et al., 2014; Vedel et al., 2011), and that context is particularly important for integration initiatives, as new initiatives need to match local needs (Armitage et al., 2009). A useful way to describe integrated care is in terms of the extent of integration (autonomous, coordinated or integrated; Leutz, 1999) for each of four integration domains (financial, administrative, organizational, professional, clinical; Kodner and Spreeuwenberg, 2002).

In summary, the main implication for research from this study is the need for improved consistency and standardization in describing and evaluating integrated care initiatives aiming to improve care transitions. The grey literature provides depth and breadth on possible approaches to integrated care for health policy decision-makers, but few of the initiatives include evaluation. For both grey and empirical literature, description of the macro as well as micro level context of integrated care initiatives is important to promote comparison and assist decision-makers, such as health authorities, to determine if the initiatives would be practical in their own contexts. In addition, evaluation of both the achievement of integration and the outcomes of integration is needed to help understanding how the integration initiative is contributing to outcomes. Of particular importance for the topic of care transitions is the inclusion of the patient perspective when evaluating outcomes. Care transitions research has identified a lack of patient inclusion and satisfaction in care transition decisions and processes (Jackson et al., 2012; Lapum et al., 2011), and integrated care research has indicated that in some cases, front line health professionals' perceptions of improvements in care delivery is not always matched by patients and families (Holstege et al., 2015). Therefore, consideration of both system and patient perceptions is important for determining the impact of integration initiatives on care transitions.

A limitation of this study was that we only included literature that was very explicit in language regarding integration. There is a large body of research on the topic of care transitions for older adults in which many different care frameworks are explicitly and implicitly used. Frameworks that may have used an approach to enhance integration but did not explicitly use this terminology would not have been captured in this review. This review also did not include documents that focused on preventing hospital admission by providing community-oriented integrated care, as we were interested specifically in older adults who had been hospitalized. The use of content analysis required the authors to interpret the meaning of text based on their own knowledge of clinical and administrative health systems and practices. The lack of use of the "consultation" step in the scoping review process may have limited the relevance of our findings to health decision makers and health services researchers (Levac et al., 2010).

In conclusion, the literature on using integrated care approaches for transitions from hospital into the community among older adults is diverse in terms of literature type as well as scope and extent of integration. There are opportunities for increasing knowledge on this topic by evaluating integrated pilots and initiatives currently planned or underway. However, to learn how to apply these initiatives in other contexts, increased reporting of how integrated care is conceptualized, whether integration was achieved, as well as description of the macro level integration context is needed.

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Chapter 4: Conceptual Framework

This chapter acts as a linking chapter between the scoping review manuscript presented in Chapter 3 and the following chapter. While there are several well developed integrated care frameworks, my scoping review confirmed that that there is no framework specific to care transitions. Therefore, this linking chapter outlines the conceptual framework that I developed to guide and focus my work on integrated care and care transitions for older adults.

The first step in the process of developing the framework was to identify the foundational philosophical concepts of integrated care that are relevant to care transitions for older adults. To determine these concepts, I used the three frameworks discussed in the literature review in Chapter 2 (Hollander & Prince, 2007; Kodner & Spreeuwenberg, 2002; Valentijn et al., 2015). The rationale for using these three frameworks was outlined in the literature review in Chapter 2, but I will reiterate the main points briefly here. The ECCF (Hollander and Prince, 2007) was used for its overall structure and its strong emphasis on philosophical components of integrated care. I used the Kodner and Spreeuwenberg (2002) framework primarily for its emphasis on the need for within service and/or institution integration, as well as between service and/or institution integration. I used the Rainbow framework (2015) for its emphasis on the use of a biopsychosocial approach, and interdisciplinary teams. All three frameworks advocate for client or patient-centred care, and the need for vertical and horizontal integration. To some extent, all three also acknowledge the dual goals of integrated care (to improve quality of care as well as system efficiency), and that integrated care can occur within one or more domains of the health system.

Consideration of the commonalities between the frameworks in relation to integrated care determined that the foundational concepts of integrated care relevant to care transitions are:

vertical integration, horizontal integration, biopsychosocial approach to care, and patient-centred care all occurring within and between settings (Hollander & Prince, 2007; Kodner & Spreeuwenberg, 2002; Valentijn et al., 2013). With the exception of the idea of integrating care within a setting, these concepts were included in the philosophical foundations of all frameworks, or implied in the recommended strategies for integrating care. I included integrating care within settings (from the Kodner & Spreeuwenberg framework) because it is emphasized as integral in the care transitions literature (Dedhia et al., 2009; Jack et al., 2009).

Next, I developed themes that encapsulate the important features of integrated care as related to care transitions. I did this by grouping features that I found in systemically developed published elements of integrated care that would be relevant to care transitions, and by considering the discharge planning literature on best practices (Parry, Min, Chugh, Chalmers & Coleman, 2009; Jack et al., 2009). The first source of integrated care features was the clinical features from my scoping review (Chapter 3, Brown & Menec, 2018). The second source was the clinical and professional dimensions of a taxonomy developed using the rainbow model of integrated primary care by Valentjin and colleagues (2015). The taxonomy had been developed using a thematic analysis of literature, and then a Delphi process to validate the features. The final source was a study by Minkman, Ahaus, Fabbricotti, Nabitz and Huijsman (2009), who identified elements of integrated care through a literature review, and then a Delphi process with 31 experts in integrated care, including researchers, project managers and managers (Minkman et al., 2009). The elements were clustered into nine groups using a group concept mapping process. I drew from the patient-centredness, delivery system, and quality care clusters as they were most relevant to care transitions.

The resulting themes and their definitions from these sources are as follows (see also Figure 4.1):

- *Hospital and community interaction for disposition planning.* Vertical integration in the form of communication, or shared care, or other, with the purpose of providing continuity of care and a high quality plan of care to support care transitions *in and out* of the hospital. "Continuity is the degree to which a series of discrete health events is experienced as coherent and connected and consistent with the patient's medical needs and personal context" (Haggerty et al., 2003).
- *Individualized multidisciplinary care plan.* Development and implementation of a multidisciplinary plan at the individual client level that is provided in the community or the hospital to assess and provide support for care transition needs.
- *Client and family involvement in disposition plan and process.* Client and family is pro-actively involved in transition plans. Client/family education focuses on medical, psychological and social aspects of health. Information on the disposition plan or discharge instructions is unambiguous and understandable at the individual level.
- *Within-hospital continuity and coordination.* Considering that a teaching hospital is a complex environment, care provision is coordinated among the many care providers for the care transition to occur in a smooth fashion.

The conceptual model is illustrated in Figure 4.1. The foundational concepts of integrated care are represented at the bottom of the figure to show that they provide a supporting infrastructure for care transitions grounded in integrated care. The four domains that are specific to care transitions are represented as four overlapping circles. They are overlapping because all four domains need to be present for a successful transition. Further, some tasks that are done to promote care transitions may address more than one domain. For example, the best practice of having boundary-crossing multidisciplinary teams addresses both the domains of multidisciplinary individualized care, and coordination and continuity between the hospital and community.

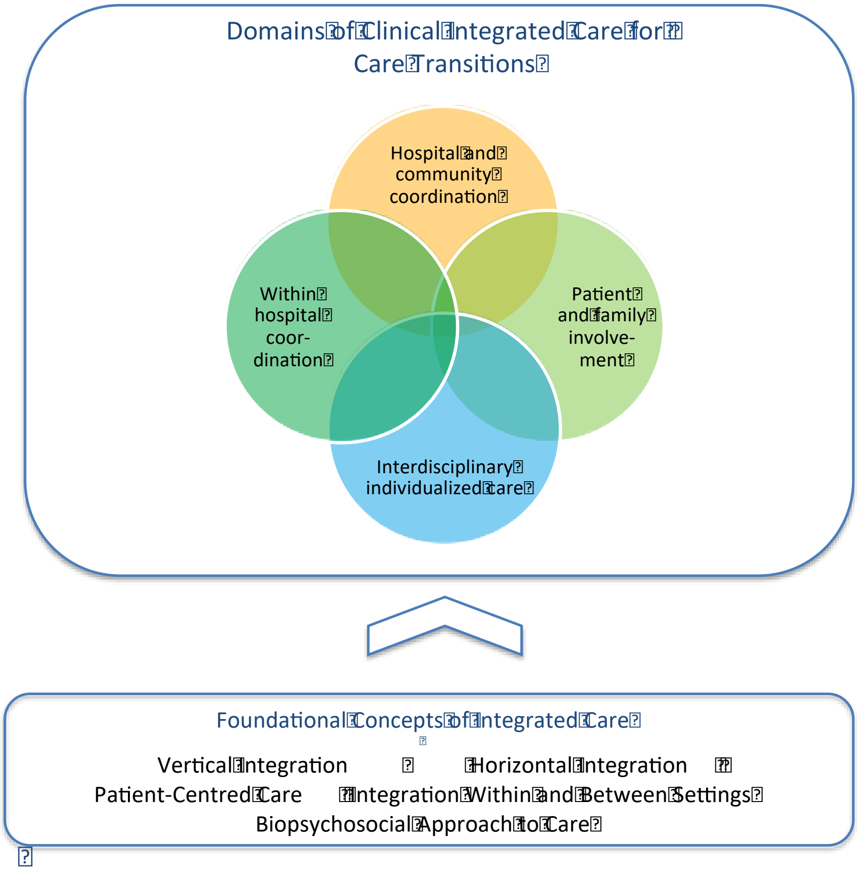

Figure 4.1: Integrated care for care transitions framework

The following chapter will address the specific methods that I used to address the second and third objectives of my thesis.

Chapter 5: Setting and Methods

This chapter provides detailed information and procedures for the study design common to objectives 2 and 3 as reported in Chapters 6 and 8, which were:

Objective 2: To characterize the older adult population that could benefit the most from integrated care approaches from a systems perspective, by looking at the association between personal characteristics of hospitalized older adults and health service outcomes.

Objective 3: To explore the feasibility of indicators for determining the extent and variation of clinical-level integrated care delivery for supporting older adult care transitions.

First, I provide an overview of the setting of the study. Then, I provide a detailed description of the retrospective chart review methodology used to address both objectives.

5.1 Setting

The study site was a large tertiary teaching hospital in Winnipeg, Manitoba, namely the Health Sciences Centre (HSC). This setting was used because: 1) it has several general medicine wards, and thus a large population of general medicine patients to study and, 2) it is both a community and teaching hospital, resulting in a diverse population. While the site of data collection was a teaching acute care centre, this thesis focuses on the relationship between the hospital and the community as well as within –hospital activities, consistent with the conceptualization of integrated care. Thus, the study setting includes the health care region within which the hospital is situated, as well as the hospital environment itself. As determined by the scoping review in Chapter 3, studies focusing on integrated care should provide detailed description of the degree of integrated care in the study setting. Therefore, in developing the description of the setting, I considered the domains and associated examples of integrated care as described by Kodner and Spreeuwenberg (2002). I also looked for grey literature providing opinion on the extent of integration present in this health region, and in instances where none was available, I provided my own evaluation of the extent of integration. This evaluation was based on experience as a clinician in both hospital and primary care settings, as well as from information gleaned from clinicians currently working in the hospital setting (personal communication,Dr. P. St. John and C. Johnson), which I mapped to the continuum of integration as first developed by Leutz (1999) and described in more detail by Thistlewaite (2011).

Canada has a universal health care system in which physician and hospital services are provided free of charge. Other services vary by province. Health care in Manitoba is delivered by five regional health authorities and three service specific organizations “that plan health care in relative isolation of each other” (p. 7, Manitoba Health, Seniors and Active Living, 2017). This study was set within one of these regions, the Winnipeg Regional Health Authority (WRHA). The WRHA has a matrix organizational structure with regional programs as well as site leadership. The organizational structure of the WRHA incorporates some elements of integration, such as overarching governance, and an administrative structure that operates across acute care centres (WRHA, 2015). However, it was recently described as complex and siloed (KPMG LL, 2017). Governance integration between the “cure and care sectors” (p. 3 Kodner & Spreeuweunberg, 2002) is limited, as the administration of clinical operations of acute/tertiary care, and primary care are administrated by different operations officers (WRHA, 2018).

In the study hospital, there are separate operations, medical, and administrative officers. In addition, separate departments and managers for each profession limits coordination of interprofessional care at the operational level (HSC, 2018). The hospital clinical processes incorporate some elements of coordinated care (Leutz, 1999; Thistlewaite, 2011). For instance, inpatient multidisciplinary teams are available to provide care during the length of the hospital stay, with referrals made to disciplines as needed on an individual patient basis. All health professional disciplines document in the same medical record. There is joint care planning that occurs formally in weekly discharge planning meetings. Three common decision support tools are included in the chart: an Advanced Care Planning form, a Falls Assessment form, and a Readmission Risk tool, but no other procedures exist that promote clinical interdisciplinary collaboration such as uniform assessment procedures. For a portion of the time during which this thesis was conducted, some wards were using a discharge checklist to ensure that discharge procedures such as ensuring transportation and notification of family of discharge were enacted. Care by the hospital team is bound by the discharge date for all patients except those in a few select programs such as the dialysis program and the palliative care program.

Of importance to care transitions is the integration between acute care and primary care. The majority of primary care services in the WRHA (serving over 80% of the Winnipeg population between 2010/2011 and 2012/2013) are operated using a fee-for-service model where family physicians operate as independent practitioners who bill the province for service provided. A minority of primary care provision (serving 6% of primary care clients between 2010/2011 and 2012/2013) has some integrated care features, such as contracted physicians, funding for the inclusion of other health professionals in the delivery of primary care, funding for information technology support, and co-location with social services (Katz et al., 2016). As for collaboration between the hospital and primary care, primary care sites are not able to directly access hospital records and vice versa. Therefore, when a patient is admitted to the study hospital, their primary care records are not readily available to the hospital staff and vice versa upon hospital discharge.

Integrated care for care transitions

Also very relevant to care transitions is the integration of acute care and community care services. Manitoba has a free of charge provincial home care program that provides individuals with in-home services to allow them to stay in their home for as long as possible. Access to home care is via a standardized assessment conducted by a case coordinator who, if the person is deemed eligible, also develops a care plan that may include personal care, home support, in-home health care services, or respite. Home care coordinators also facilitate transitions to nursing homes. Nursing home admission is also based on a needs assessment. The cost of the nursing home is shared between the resident and government, with a daily resident rate calculated according to the individual's income (Manitoba Health, 2017).

The home care program has features that would be considered to be coordinated (Leutz, 1999; Thistlewaite, 2011). For instance, the home care program includes some social services for those with financial or special medical needs, such as assistance with meals or laundry, rather than focusing solely on health needs. Further, home care case coordinators link clients to social resources in other subsidized or private programs. Another feature of coordination in the home care program is that the program has strong linkages between the community and the hospital (Manitoba Health, 2017). Upon admission to hospital, a hospital community care coordinator assumes care from the community home care coordinator, and assesses and organizes community home care needs before transferring care back to the community home care coordinator upon hospital discharge. Hospital and home care case coordinators work within their own settings, but both work according to the same policies and procedures for care planning and delivery. A feature of integration in the home care program is that home care coordinators use a shared electronic medical record (EMR) system (personal communication L. Davidson).

In regards to integration between hospital and community services, just as most hospital services are bound to the hospitalization, most community services are bound to the community with only a few exceptions. One of these exceptions is interdisciplinary geriatric assessment teams that provide service in the community as well as the emergency department (personal communication, C. Johnson).

Overall, the vertical integration of the system would be described as autonomous/coordinated, with a few linked/integrated features, according to the framework developed by Thistlewaite (2011). This is corroborated by an accreditation report of this region that concluded that too much focus was being put on the acute care sector in order to try to improve access to acute care. The authors conclude that: “A formal regional approach that supports clear engagement and collaboration has not yet been implemented among primary care, pre-hospital, acute, community, and long-term care. This is evident not only in the health care sector but also with the minimal engagement at the client and family level” (p. 50, Accreditation Canada, 2016).

5.2 Method and Rationale

The two studies in Chapters 7 and 9 were completed with a retrospective patient chart review. Patient charts are a readily accessible rich data source beyond what can be feasibly collected with primary data collection, and are more in-depth than administrative health care data or hospital abstract data (Gearing, Mian, Barber, & Ickowicz, 2006). Patient chart documentation is generated over the course of the day-to-day delivery of health care. Health care professionals are legally obligated to chart patient assessments and interventions; they also chart for practical reasons such as to facilitate communication between team members. As such, the charts may contain large volumes of information that detail the course of a health encounter or illness. The charts in the study hospital provided in-depth data regarding demographics, social situation, services and supports preadmission, services and supports planned for discharge, information on care transition planning and decision-making (such as discharge planning meetings), and information on communication between the hospital and community services.

The major strength of chart review for determining the older adult medical patient who can benefit from integrated care (objective 2) is that it mitigates issues with enrolment and attrition for this population who may be too ill to undergo assessments or interviews, a common issue when studying a vulnerable population with complex illness. This method is the most logical for addressing objective 3, which aims to develop quality indicators for evaluating patient care delivery. Quality indicators are most typically examined using data that is collected during routine patient care (Rubin, Provonost & Diette, 2001), as this is the most feasible method for studying an entire cohort that has received care in a program or institution (Allison et al., 2000).

Chart review studies most typically employ a quantitative approach (Jansen et al., 2005; Vassar & Holzman, 2013) for the purpose of quality improvement or clinical research activities. Research or quality improvement questions are posed, and data extractors locate and extract data on the independent and/or dependent variables from patient charts. Despite chart review being a popular approach to clinical research (Gregory & Radovinsky, 2012), there is a limited body of literature guiding chart review method. Allison and colleagues noted the paucity of literature describing chart review methods in 2000, when they set out to implement a chart review evaluation of care of beneficiaries with depression. In response, they provided a detailed description of their process of conducting the chart review, starting with selection of a data collection tool, all the way through to the monitoring and maintenance of data quality during the data collection phase. This article was important as it provided detailed steps for a chart review that was previously absent in the literature, and highlighted important considerations for assuring reliability and validity of the chart review. Gearing and colleagues (2006) added to the discussion by framing the chart review within the broader research process, starting with the development of the research question.

Since the seminal article by Allison and colleagues (2000), there have been only a few unique additions to this body of literature (Gregory & Radovinsky, 2012; Vassar & Holzmann, 2013). Worster & Haines (2004) and Liddy, Wiens and Hogg (2010) recommend using both percent agreement and kappa values when reporting inter-rater reliability to ease data interpretation. The kappa statistic shows how much of the percent agreement could have occurred by chance. Liddy et al. (2010) also recommend periodic checking of inter-rater reliability and the use of the inter-rater values as a feedback mechanism for continuous quality assurance throughout the data collection process.

5.2.1. Sample.

This thesis focused specifically on older adults (age 65 and over) who were admitted to general medicine wards ("general medical patients") and required continuing care following the hospital stay. "General medical patients" excludes surgical and psychiatric patients. General medical patients tend to be a more heterogeneous population in terms of medical diagnosis than surgical and psychiatric patients. While most hospital wards are focused on one body system, such as the orthopedic ward, or the cardiology ward, a general medical ward includes patients with a range of diagnoses and comorbidities that require non-surgical intervention. For example, a general medical ward may include patients with primary diagnoses such as diabetes, heart failure, pneumonia, dementia, cancer, respiratory conditions, or rheumatic diseases. In addition, these wards accept patients needing a non-medical admission (for example, patients whose level of function has declined to the point that their current supports are no longer sufficient), and may accept patients for whom a diagnosis has not yet been determined. Findings from a systematic review support the need to study the general medical population, as this population is less amenable to hospital-implemented care transition interventions than interventions targeted at patients with specific diseases (Rennke et al., 2013). Further, integrated care approaches typically aim to address the needs of patients with this type of complex medical and social profile (Maruthappu et al., 2015).

This thesis included only older adults who received continuing care upon discharge. Continuing care refers to formal community care provision and thus this thesis focuses in on older adults who were community-dwelling prior to the hospitalization, and required home care services, nursing home, or inpatient rehabilitation upon hospital discharge. This criterion ensured that older adults who require coordination for their care needs were the focus of this thesis, consistent with the intent of integrated care.

Inclusion criteria included:

- age 65 or over at the time of hospital admission,
- community-dwelling at time of admission
- discharged with continuing care (includes home care, rehabilitation, geriatric rehabilitation, nursing home, interim care).
- charts had been reviewed administratively and confirmed to be complete.

Exclusion criteria included:

- individuals who were residing in an institution prior to admission,
- transfers from other hospitals,
- those who died during the hospitalization.

I employed a quota sampling strategy whereby “a predetermined number of cases are sought” (Gearing et al., 2006). My goal was to study a cohort of individuals within a similar timeframe to enhance the understanding of this cohort of individuals, and to enhance the generalizability of the findings by studying a sample that had very recently interacted with health care services. The HSC Health Information Services department generated a report of all admissions meeting my inclusion and exclusion criteria. Charts meeting the inclusion and exclusion criteria were pulled working backwards in time until the desired sample was reached.

No formal power analysis was done prior to initiating data collection due to the emerging nature of the variable development with the chart review method. One rule of thumb for chart review analysis is to have 10 charts per variable (Gearing et al., 2006) and so a minimum of 200 charts was a goal to allow for 20 variables in a regression analysis. The charts all represented patients with a discharge date between January 2014 and September 2016. In the case where multiple admissions for the same individual met the study criteria, I collected data from the most recent discharge.

5.2.2. Data Sources.

Three data sources were used to access the data needed for this study.

5.2.2.1 Health Sciences Centre Information Services Department data report.

The HSC Information Department extracts data from patient charts post-hospitalization in compliance with the mandatory reporting requirements for the CIHI Discharge Abstract Database (DAD) (CIHI, n.d.b; CIHI, n.d.c). The DAD “captures administrative, clinical and demographic information on hospital discharges” (CIHI, n.d.c) to comply with hospital abstract requirements of CIHI. Their reports provided concise information on basic demographic and health data for the study, eliminating the need for me to abstract this data myself. In addition, another advantage to these reports is that the data are abstracted in a way that is consistent between all Canadian hospitals. The quality of the data abstraction is monitored by CIHI and evaluated annually. Quality assurance practices include data quality checks and follow-up with each data provider (e.g. each Canadian hospital), and with statistical analysis of the data using grouping and weighting methodologies (CIHI, n.d.b). Data quality is reported annually on aggregate national data (CIHI, n.d.c). *Specific strategies used by CIHI to ensure data quality include:*

- Reviewing data to ensure it is submitted to CIHI “in the expected format, falls within a specific range of values and has a logical relationships to other data elements.” (p. 6, CIHI, n.d.b). Reports are sent back to the institution with abstracts and/or fields that have been flagged for correction.
- CIHI provides client services representatives and an education program for each province and territory to answer questions related to data quality, and deliver education on coding and abstracting.
- The CIHI Data Quality department evaluates coding and abstracting accuracy with re-abstraction studies which involves returning to the original patient chart to compare the chart information with the information in the DAD (CIHI, 2012, n.d.b).

5.2.2.2. Patient record review.

As the hospital extracts only demographic and health data, I extracted social and functional variables, and integrated care indicators directly from the medical records. Sources from the chart included the admission sheets, preadmission community home care plans that are included in the chart to inform hospital care and discharge planning, medication reconciliation records, standard forms (for example, a fall risk tool), and inter-professional progress notes (including nursing, physical therapy, occupational therapy, social work, and physicians).

5.2.2.3 Statistics Canada census data.

Income was an important variable to include, due to the influence of the social determinants on health and health service access (Commission on the Social Determinants of Health, 2008). However, income is not reported in the charts. I was able to derive neighborhood level income from public access 2016 census data from ***http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E***, using the patients' postal code.

5.2.3. Data collection tool and repository.

I used the REDCap Data Collection tool for collection and storage of the data from both the HSC health information report and the HSC paper charts (data sources #1 and #2 listed above). Data was directly entered from either the excel spreadsheet provided by HIS, or the paper chart, into the REDCap platform: a secure, web-based application designed exclusively to support confidential data capture for research studies. REDCap promotes data integrity for data extraction from charts as it allows for data extraction instructions to be presented alongside the data variable entry fields. This eliminates the need for a separate data abstraction guide. The REDCap Production Server is within the Rady Faculty of Health Sciences Secure Research Environment (SRE) and is audited and supported by the George and Fay Yee Centre for Health Innovation. A major strength of this tool is data security. A limitation of this tool in the design phase is that making changes to the tool can be time-consuming. Further, caution needs to applied with making tool changes as this can result in loss of previous data entry. A limitation of the tool during data collection itself was a lack of ease of navigation between data collection forms, increasing the data collection time for large paper charts. REDCap has options for data limiters (e.g. for dates, and numerical fields). Branching logic allowed for streamlining the data collection forms for ease of data entry. The REDCap tool automatically generates a data dictionary as the data collection forms are developed within the system. The data dictionary provides an overview of the data collection in one Excel form. It includes each variable name, the type of variable, specific instructions for data entry, any limiters, and the variable options for categorical variables.

5.2.4. Data collection procedures.

An overview of the data collection procedures are summarized in Table 5.1. These procedures were adapted from guidelines by Gearing and colleagues (2006) and Allison and colleagues (2000).

Table 5.1: Data collection procedures

Data Collection Steps	**Key Tasks**	**# of Charts**
1. Variable Development	Choose variables Determine variable response options Develop draft data abstraction form	3
2. Data Collection Tool Refinement and Training Data Abstractor	Refine variables, variable response categories, data abstraction form flow, and data abstraction instructions. Train data abstractor	16
3. Pilot	Determine inter-rater reliability. Complete additional training as required	5
4. Completion of data extraction	Complete data collection	192 complete records
Total Records		214

5.2.4.1. Stage 1: Variable development.

A variable framework and data capture plan was required for Human Ethics approval prior to obtaining patient chart access. Thus I first developed a tentative variable framework for this purpose. Three main groups of variables were developed to address both the second and third research objectives: personal factors, integrated care factors and trajectory of care. Personal variables were chosen based on previous research findings and gaps (Kansagara et al. 2011; Health Quality Ontario, 2013b), including social support (e.g. informal caregiving; living alone), cognitive status, and behavioral status (e.g. aggressive; agitated). The plan for accessing variables on integrated care practices was less detailed as there was little literature for guidance. Integrated care models were used to determine data that may allow for indicator development for individual-level service delivery and clinical integrated care practice (as outlined in Chapter 4). Two trajectory of care variables were included: discharge disposition (home with home care; assisted living or supportive housing; nursing home; transitional care) and ALC status.

Once HREB and institutional permission was received for chart access, I reviewed three charts to begin operationalization of the variables as suggested by Allison and colleagues (2000). The three charts varied in length of stay and discharge destination in order to ensure that the variables developed would be applicable across different patient scenarios. I started by carefully reading through these charts, and abstracted data that was present as anticipated, and deleting and adapting variables as necessary according to the data available in the chart. In this way, the REDCap data abstraction forms were developed, and REDCap automatically generated a data dictionary.

There were a significant number of variables that were not present as anticipated, and relevant information available in the chart that was not anticipated from which I developed new variables. Therefore, I also tracked the variable development in an Excel sheet so that I could group the variables according to content area using different Excel sheets for each variable group. This provided a feasible way to get an overview of the variable groups as a whole that was not possible in REDCap.

Changes to the overall framework and rationale that were made included:

- *Adding previously unknown available variables.* There were easily extractable data that I was not aware of when I developed the preliminary variable framework. For example, *cognitive orientation* was consistently recorded in almost all of the charts at both admission and discharge.
- *Changing variable response options.* This was required to ensure that the response options for data extractors were consistent with how information is documented in charts. For example, I was planning to use InterRAI question response categories (independent, supervision, limited assistance etc.) for items about functional performance. However, the hospital clinicians document functional independence using different terminology (for example, stand by assist, min assist, mod assist, etc.).
- *Deleting variables with poor data consistency*. Some variables that I anticipated using were not available or not consistently available. For example, pain was not consistently documented and was deleted from the variable framework.
- *Adding narrative data variables*. I originally anticipated developing only nominal, ordinal or interval response options. However, narrative information in the progress notes and in open-ended questions on forms provided relevant information on integrated care, but would be difficult to extract in the form of closed ended variables. Therefore, I adapted the plan to include open-ended variables (much like a survey that includes both closed and open-ended questions). For example, for information on multidisciplinary team planning for discharge, data was directly abstracted from a form containing narrative summaries of multidisciplinary discharge meetings.

- *Adding and adapting variables according to integrated care frameworks*. This group of variables required extra attention at this stage of data collection because it had not been as clearly operationalized prior to engaging with the charts. This was because there was no precedence in the literature on variables that address integrated care specific to care transitions. To assist me with this task, I used the framework presented in Chapter 4 to inform my decision-making regarding deletion, changes and additions to my originally developed variable framework for integrated care.

5.2.4.2. Stage 2: Data collection tool refinement and training data abstractor.

Following development of the variable framework, I continued to collect data from charts, and as variation arose from different charts, adapted variable response options and data collection instructions accordingly. Data extraction was initially found to be too cumbersome, requiring four hours per chart, which was not a feasible time commitment for the desired sample size and resources available for this study. As a result, I determined variables to eliminate if there was a high proportion of missing data (I eliminated those that were missing the datapoint in three of the eight charts). For concepts with multiple variables, I also reduced the number of variables (for example, reducing the number of variables measuring activities of daily living from six to two). Following this elimination of variables, the extraction process took two hours, much closer to the goal extraction time of 90 minutes.

Once the data extraction process was streamlined, a recent Master of Occupational Therapy graduate was hired as a research assistant. She was provided with an initial orientation and training period of 20 hours. Orientation was provided on:

- Accessing the secure research environment using the study laptop;

- Trouble shooting computer issues related to remote access to the secure research environment;
- The REDCap environment;
- The overall project objectives;
- The Health Information Department chart review environment and staff;
- The organization and processes of accessing and returning charts in the chart research environment;
- The HSC chart itself.

Data specific data abstraction training followed these steps:

1. Joint data abstraction of two charts where we took turns entering data or searching the chart for data and entered one set of data.
2. Side-by-side extraction of two charts where the research assistant extracted data independently but we discussed issues as they arose, and we developed protocols to address them. The data abstraction forms or procedures were updated as necessary during this process. I also reviewed both these extractions and provided feedback to the research assistant on extraction quality. All changes and updates were tracked using the automatically generated data dictionary from REDCap. I also added a column for ‘special instructions’ to the REDCap data dictionary to produce a final data abstraction manual for the research assistant.

The variable framework for addressing objectives 2 and 3 was finalized at this point and is shown in Table 5.2.

Table 5.2: Overview variable framework for data collection

Personal characteristics	**Demographic and Social**	**Health**	**Level of function**
	Age* Sex* Socioeconomic status (via postal code)* Language spoken at home Lives alone Informal caregiver preadmission	"Most responsible diagnosis" for LOS.* Co-morbidities* Number medications (P and D) Number medical interventions in hospital (Illness complexity)* Part of stay in ICU (Illness severity)*	Cognitive impairment (P) Presence of challenging behaviors (A and D) Continence (P and D) Self care: toileting, taking medications, bathing (P) Equipment and assistance needed for mobility Vision and hearing Schmid fall risk score (A and D) Cognitive orientation (A and D)
Integrated care practice	**Hospital and Community Interaction**	**Individualized Multidisciplinary Care**	**Client and Patient Involvement in Discharge Planning**
	Interactions between hospital and outside services and providers. Who was involved and purpose of interaction. Presence of discharge summary, dates of dictation and transcription, persons cc'ed. Follow-up appointments recommended and whether or not made prior to discharge.	Discharge Planning Tool use Multidisciplinary team discharge planning documentation (presence of and content of Discharge Rounds log). Other multidisciplinary meetings for discharge planning Number and type of hospital multidisciplinary team members consulted, purpose and recommendations. Services planned for discharge.	Discharge planning meetings with patient and/or family. Documentation of patient involvement in discharge planning Discharge information sheet presence and content.
Care needs and trajectories	**Preadmission Services**	**Discharge disposition**	**Hospital Stay**
	Concerns of client's ability to manage in community or with current care levels and plans to address Home care services Other formal care provision	Home with home care Nursing home Assisted living Supportive housing Long-term transitional care	Ward transfers Number of attendings Length of stay ALC status* Documented barriers or facilitators to discharge Summary of course of stay as reported by hospital physician

A=at admission; P=preadmission; D=at discharge
*Provided by the HSC Information Department; all other variable extracted from paper chart.

5.2.4.3. Pilot phase.

The main objective for this pilot was to determine inter-rater reliability. Related to this was confirming that the abstraction protocols, procedures and descriptions in the data collection forms and manual were adequate (Gearing et al., 2006). To determine inter-rater reliability, the research assistant and myself independently extracted and input data from the same five charts. I used the "data comparison" feature in REDCap, which generates a report of all the responses that are not identical between the sets of data. We reviewed every discrepancy from the first two charts, explaining our rationale for our responses to each other, and used this information to continue to improve the data abstraction tool and variable definitions. We did the same with the next two charts, which revealed no need for further procedure changes, and then completed dual abstraction of one final chart, resulting in a total of five charts used for IRR calculation.

The inter-rater reliability (IRR) for categorical questions was calculated using percent agreement. All checkbox options were considered in agreement if exactly all the same checkboxes were chosen for both charts. All categorical options were considered in agreement if identical. Percent agreement using these parameters was calculated as 90.5% for dropdown box option responses and 88.5% for checkbox response options. The recommended inter-rater reliability is 95% for important variables (Allison et al., 2000). Our IRR was lower than this recommendation. One reason for this was that some variables had many category options to allow for easy entry for the variety of terminology in the chart, but this meant that two abstractors may choose two similar but different response options. For example, to indicate that an individual ambulates with assistance, two response options could be used: one maximal assist or one assist, depending on the exact chart note used by the abstractor. These terms are interchangeable however, and while they may not be found to be in agreement for the IRR calculation, they are in agreement in concept. Therefore, our initial calculation of the IRR was considered to be an underestimation of the potential IRR that would be achieved once the similar response options for the variables were collapsed. A second issue was the very high variability between charts for data such as community services involved, and different hospital team members involved in the patients' care. Therefore, we took the following approach for the remainder of the data extraction to ensure data fidelity:

- The two data abstractors (myself and the assistant) spent a large amount of time engaged in side-by-side extraction throughout the data extraction process to ensure that we could discuss any emerging issues or new information encountered in the charts.
- We used the 'comment' feature in REDCap. The research assistant could insert a comment beside any entry that required my review and decision. Charts were not returned to storage until I reviewed the comments and the paper chart and resolved issues.
- I performed random checks for accuracy as well as checked for completeness of data extraction for areas of the chart that tended to be highly variable (for example the correspondence section) (Gearing et al., 2006). I provided feedback to the research assistant following these checks.
- I performed another inter-rater reliability calculation on the variables used in my analyses of personal characteristics based on how these variables were collapsed (see Chapter 7).

The finalized data extraction guide can be found in Appendix A. To develop this guide, I used the data dictionary generated by REDCap in an Excel format. To it, I added special instructions and procedures for data abstraction. Therefore the manual included the variable names, the form name in which it would be found, the section header, if applicable, the field type, the field label, the category options, and the column that I added which provided a definition and information to support recording decisions.

5.2.4.4. Stage 4: Completion of data abstraction.

The research assistant and myself collected data from charts until we had collected data from 220 charts. This was an over-sampling by 20 charts, to ensure that there would be a minimum of 200 charts with no data errors available for analysis. There were nine charts requested that were not accessible by the end of the data collection period. These charts were being used for patient care delivery (n=2), could not be found by Health Records (n=3), or the wrong record was received and the correct one was not received by the end of the data collection timeframe (n=4). These charts were all for non-ALC discharges. There were 34 charts in the study time period that were not requested because the sample size goal had already been exceeded. These charts were for discharges in 2014 (12 ALC and 22 non-ALC).

5.2.4.5. Strategies employed for data fidelity.

An unavoidable limitation of chart review methodology is the inability to verify the information documented in charts (Gearing et al., 2006). However, I used multiple strategies to ensure that the data extracted from charts was high quality. Measures taken included: consulting with site-specific clinicians regarding patient documentation; developing of abstraction protocols and guidelines; clearly indicating in the protocols where data should be extracted from; development and use of variable definitions and time frame guidelines in the abstraction protocols; careful selection, training and monitoring of a data abstractor; use of a data abstractor with a health profession background; having protocols for managing ambiguous, conflicting and/or missing data, conducting a pilot study; use of REDCap data limiters for dates and numerical fields; and measuring of inter-rater reliability (Allison et al., 2000; Gearing et al., 2006).

5.2.5. Data analysis.

Data were exported from the REDCap system to SPSS version 24 for data analysis. Data were cleaned and organized. Non-response bias can be an issue in chart review studies, since chart documentation is problem-based (Gearing et al., 2006); that is, only problems or abnormal situations are documented, since documenting all normal behaviors, and health indicators is overly burdensome. To address the potential for non-response bias, I did a correlation of missing values of the main demographic, social and function variables. This was done by using the raw data for the main personal characteristic variables, and converting each one into a dichotomous variable (missing; not missing) so that I could conduct a Spearman correlation analysis of these variables. I also correlated each variable with the dichotomous variable of over or under 30 day length of stay, as there is the potential for more missing data for shorter lengths of stay.

There were significant ($p=0.01$ or less) but weak correlations (.3 to .5) between preadmission function variables and whether or not there was the presence of an informal caregiver preadmission. The only correlation related to length of stay was that there was a weak correlation with length of stay and whether or not there was a discharge information sheet (.38, $p \leq 0.01$). Therefore, non-response bias was not considered to be an issue for further analysis of this dataset.

5.3. Ethical Considerations

This study was approved by the University of Manitoba Health Research Ethics Board and the Impact Committee at HSC. To maintain confidentiality of data, we collected a minimal amount of potentially identifying data, including only two indirect identifiers (date of birth and postal code). Chart numbers were assigned a study ID number. When data was pulled from the REDCap server for data analysis, the data was separated from the identifiable ID number. Within the secure REDCap environment, the study ID and chart ID remained linked in case I needed to return to the paper charts for data confirmation.

Paper charts were reviewed in a designated research space in the HSC Information department and data were inputted directly into the secure REDCap system. Security for the REDCap system is ensured by requiring each study staff member to register for a security token for access to the online research environment. Both data extractors had up-to-date research Personal Health Information Act (PHIA) training.

In sum, retrospective chart review was the primary method used in addressing research objectives 2 and 3 of this thesis. Data analysis procedures specific to each research objective are addressed in the respective manuscripts that follow. The following chapter addresses objective 2, which was to characterize the older adult population that would benefit from integrated care approaches.

Chapter 6: Linking Chapter

This is a linking chapter between the detailed description of the methods and the manuscript in the following chapter that addresses objective 2: to characterize the older adult population that could benefit the most from integrated care approaches from a systems perspective, by looking at the association between personal characteristics of hospitalized older adults and health service outcomes.

This objective takes a health services approach to the question of: what population should we target for specialized integrated care programs? Improved health system outcomes are one of two primary goals of integrated care. It is believed that improved integration of a system of care can benefit the entire population within the system (Valentijn et al., 2015). However, it is also believed that sub-populations with particularly high care needs should be targeted when implementing more specialized high resource integrated care programs (Evans et al., 2013; Sansoni et al. 2015). One of these high need populations are older adults with chronic diseases (Chappell & Hollander, 2013). However, it is not clear who exactly should be targeted within the older adult population with chronic diseases (Harrison et al., 2017; Kansagara et al. 2011).

This study tries to answer this question by looking at a sample of older adults who all received continuing care on discharge and compares those with poor health services outcomes to individuals with better outcomes. By looking at differences between these two groups, we can determine the characteristics of older adults with the highest care needs. These individuals may thus benefit the most from integrated care.

The three outcomes studied are commonly considered undesirable health care outcomes in the health services literature, as discussed in the literature review. However, to acknowledge that discharge to nursing home, or a long stay in hospital is sometimes necessary, I have used the term *potentially avoidable health care use* to describe the three outcomes.

The conceptual framework used in this manuscript is as described in this thesis in Chapter 4: Conceptual Framework.

Chapter 7: Health, Social, And Functional Characteristics of Older Adults with Continuing Care Needs: Implications for Integrated Care

7.1 Abstract

Objectives: To identify older adults that could benefit from integrated care, we examined: 1) health, social, and functional characteristics of older hospitalized adults who required continuing care on discharge; and 2) associations between these characteristics and potentially unnecessary health care use.

Methods: Personal characteristics were extracted from patient charts (n=214) and examined in relation to three outcomes: discharge to institutional care, unnecessary hospital stay (alternative level of care), and long hospital stay.

Results: Twenty-nine per cent of the sample was discharged to an institution, 32.7% was coded as alternate level of care, and 27.6% had a long length of stay. Independent predictors of potentially avoidable health care use were mental and behavioral issues, living alone, functional status, and preadmission concerns about the patient managing in the community.

Discussion: High users of health care services were identifiable prior to hospital admission, supporting the use of community-based integrated care approaches.

Key words: health services; social services; chronic illness; hospitalization; community care

7.2 Background and Objectives

Addressing the health service needs of older adults is a societal priority as the population ages with increasingly high rates of chronic disease and multimorbidity (World Health Organization, WHO, 2015). It is estimated that up to 90 per cent of community-dwelling older adults are living with chronic disease or disability (Denton & Spencer, 2010), resulting in high health and social care needs. Older adults are the heaviest users of inpatient hospital services

(Canadian Institute of Health Information, CIHI, 2011), with consequences at both the patient and system levels. These issues include high occurrences of adverse events following hospital discharge (Forster, Murff, Peterson, Gandhi & Bates, 2003; Forster, Murff, Peterson, Gandhi & Bates, 2005), preventable hospital readmissions (CIHI, 2012), post-discharge emergency department visits (CIHI, 2012; Rising, White, Fernandez & Boutwell, 2013), hospital stays that extend beyond medical need due to deficits in community-based care (CIHI, 2011), and uncoordinated transitions of care between the hospital and other care environments (LaMantia, Scheunemann, Viera, Busby-Whitehead, & Hanson, 2010).

Care models for older adults are evolving to address these issues. Integrated care is a promising approach to meet the complex needs of older adults with chronic conditions (Hollander & Prince, 2007). The broadest conceptualizations of integrated care include integration of social and health services, as well as, integration of primary, secondary and tertiary care (Hollander & Prince, 2007). The desired outcome of integrated care is more continuous and higher quality of care while maintaining cost-effectiveness by substituting hospital and residential care with less expensive home and community-based care (Chappell & Hollander, 2013). Therefore a major goal of integrated care is to reduce potentially avoidable health care use, including transitions in and out of institutional care settings (Hollander & Prince, 2007).

Integrated care approaches are believed to be most effective when applied to populations most in need. To ensure cost-effectiveness, health care programs are working to target the small, high-risk, complex group of patients that has high service needs and health care cost consumption (Sansosi, Grootemmat, Habibur Seraji, Blanchard & Snoek, 2015). In fact, there is evidence that the inability to target the right population for integrated care may be more of a barrier to improving clinical outcomes than the intensity of interventions (Threapleton et al., 2017).

Although the need for integrated health care has been identified, and conceptual models have been developed (Chappell & Hollander, 2013; WHO, 2015), it is not well known which older adults should be targeted for integrated care interventions. The research focus to date has been on developing easy to implement risk prediction tools for the general older adult population (Sansosi et al., 2015), rather than exploring the complexity inherent in older adult populations with known continuing care needs to inform integrated care approaches. Therefore, we do not have a full understanding of the characteristics of the complex older adult population with high hospital and community health care needs (Harrison et al., 2017; Kansagara et al. 2011).

Systematic reviews of hospital outcomes for older adults suggest that our understanding of the predictors of adverse hospital outcomes such as institutionalization post-discharge and readmissions is limited due to the narrow scope of variables that have been studied (Harrison et al. 2017; Kansagara et al. 2011). For example, discharge to institutional care seems to be driven by functional dependency, dementia, and being female, but social and clinical variables such as informal caregiving and continence are often not included (Harrison et al., 2017). The situation is similar for the outcome of length of stay. Certain medical conditions (deBuyser et al., 2014), preadmission medications and falls (deBuyser et al., 2014), malnutrition (Lin et al., 2012), walking speed (deBuyser et al., 2014), pain (deBuyser et al., 2014), delirium/dementia (Fick, Steis, Waller & Inouye, 2013; Zekry, 2012), and other mental health conditions (Bressi-Nath & Marcus, 2012; Prina et al., 2013), are associated with long lengths of stay in studies, but there has been minimal study of social and clinical variables.

Given this gap in the literature, the overall aim of this study was to develop an understanding of older hospitalized adults with continuing care needs. We focused on these individuals, as they would likely benefit the most from integrated care interventions to reduce potentially avoidable health care use. The specific objectives were to examine: 1) the health, social, and functional characteristics of older hospitalized adults who required continuing care upon discharge from hospital; and, 2) relationships between these characteristics and potentially avoidable health care use, including discharge to institutional care, unnecessary hospital use (alternate level of care, ALC), and long hospital stay.

7.3 Research Design and Methods

We conducted a retrospective chart review of older, hospitalized adults with continuing care needs. The hospital chart review allowed for collection of both preadmission and in-hospital variables in more depth than is available from hospital administrative data (Gearing, Mian, Barber, & Ickowicz, 2006), while avoiding some of the disadvantages of primary data collection, such as recruitment or attrition issues related to cognitive impairment, or severe illness.

7.3.1 Setting.

This sample was taken from a teaching hospital in a Canadian province. Canada has a universal health care system in which physician and hospital services are provided free of charge. Other services vary by province. The province where the research was conducted has a free of charge provincial home care program that provides individuals with in-home services to allow them to stay in their home for as long as possible. Access to home care is via a standardized assessment conducted by a case coordinator who, if the person is deemed eligible, also develops a care plan that may include personal care, home support, in-home health care services, or respite. Home care coordinators also facilitate transitions to nursing homes. Nursing home admission is also based on a needs assessment. The cost of the nursing home is shared between the resident and government, with a daily resident rate calculated according to the individual's income.

7.3.2 Sample.

This study included older adults who were under the care of the general medicine service of the study hospital. Inclusion criteria were: age 65 or over at the time of hospital admission; living at home preadmission; and, either discharged home with home care, or transferred to institutional care, such as inpatient rehabilitation or nursing home. Patients who were residing in an institution prior to admission, or who died during the hospitalization were excluded. Starting in December, 2016, charts that met the study inclusion and exclusion criteria were pulled backwards in time, until the desired sample (minimum of 200) was reached. All patients had a discharge date between January 2014 and September 2016. In the case where an individual had multiple admissions that met the study criteria, we collected data from the most recent discharge. The charts for nine patients were not included because they were not received from the hospital information services within the data collection period. The final sample was 214 individuals.

7.3.3 Data sources and collection.

Data were extracted from three sources. First, a data report from the hospital's health information services department was used to obtain basic demographic and health data. The department extracts data from charts post-hospitalization in compliance with the mandatory reporting requirements for the CIHI Discharge Abstract Database (DAD) (CIHI, 2015; CIHI, n.d.). Variables gleaned from this source were: age, length of stay, ALC, preadmission and in-hospital diagnoses, postal code to derive income, and hospital interventions.

Second, a chart review was conducted of patient records. Extraction procedures were informed by guidelines developed by Gearing and colleagues (2006) and Allison and colleagues (2000). Social, health, and functional information was extracted into a standardized data abstraction form within a secure, web-based application (REDCap) designed to support confidential data capture for research studies (Harris et al., 2009). The lead author (LA) and a research assistant, who are both licensed health care professionals, completed the data extraction. The LA provided 20 hours of training to the research assistant, including joint data extraction of two charts, and side-by-side extraction of two charts to facilitate coding consistency and discussion for resolution of coding discrepancies prior to independent collection. A data abstraction procedures manual was developed that included variable definitions, time frame guidelines, and instructions for management of negative (including absent or not applicable) information, as recommended by Allison and colleagues (2000). Following training, the LA and research assistant both extracted data from the same five charts, and the inter-rater reliability (IRR) was calculated to be 96.9% agreement for the variables included in this study. Data extraction fidelity was promoted with regular updating of the data abstraction procedures manual, and random checks of data quality by the LA (Allison et al., 2000; Gearing et al., 2006).

All variables not included in the data report from the hospital’s health information department were extracted directly from the patient records. Sources included the admission sheets, preadmission community home care plans that are included in the chart to inform hospital care and discharge planning, medication reconciliation records, standard forms (for example, a fall risk tool), and inter-professional progress notes (including nursing, physical therapy, occupational therapy, social work, and physicians).

Third, neighborhood level income was derived from public access data, the 2016 census from Statistics Canada (http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E), as income-related information was not available in the hospital records.

This study was approved by the institution's Ethics Board and reviewed and approved for impact by the study hospital.

7.3.4 Measures.

7.3.4.1 Demographic and social characteristics.

Sex, age at admission, and language spoken at home were included as dichotomous variables. Age was categorized into under 80 years, or over 80 years of age, and language spoken at home was categorized as English or other, given that relatively few patients spoke a language other than English at home. We recorded whether or not the patient lived alone and if an informal caregiver was identified in the chart. Neighborhood income was derived from the patient's postal code using the 2016 Statistics Canada census, and then dichotomized using a median split into high or low income using a cut-off of $24,000/year.

7.3.4.2 Preadmission variables.

Home care services. We included whether or not patients were enrolled in the provincial home care program.

Health status. For a measure of co-morbidities, we derived the number of body systems impacted preadmission from the hospital information services preadmission diagnostic codes. Diagnoses are categorized using an enhanced version of the ICD-10 developed by CIHI for morbidity classification in Canada (CIHI, n.d). With this coding system, there is some repetition in diagnostic labeling. To avoid double counting conditions, we counted the number of ICD-10 alphabetic blocks (each alphabetic block represents a main body system), rather than using a raw count of diagnoses. For example, coding of: E11.52 (diabetes mellitus [DM] with complications), E11.28 (DM with kidney complications), I25.2 (old myocardial infraction), and I50.0 (congestive heart failure), was counted as two main body systems impacted. We also coded as a dichotomous variable whether or not there was a behavioral or mental diagnosis present preadmission.

We counted the number of scheduled (non-prn) prescribed medications taken preadmission using admission medication reconciliation forms, and dichotomized this variable into five or less, or six or more medications. Only non-prn medications were included to minimize data collection burden.

Cognition and behavior. Preadmission cognitive impairment was considered present if one or more of the following was met: 1) standardized cognitive screening score below normal; 2) a health professional thought the patient was unsafe to be left alone or to use the stove, or 3) the patient received home care reminders for medication, a service provided when a patient requires cognitive assistance with medication adherence. Preadmission challenging behavior was considered present if the patient was recorded as being verbally, or physically abusive, sexually suggestive, or if agitation interfered with caregiving.

Incontinence and function. Preadmission incontinence was recorded as present if partial or full urinary incontinence was documented (excluding device use such as catheter). For activities of daily living (ADL), we counted the number of ADL for which the patient was dependent (of bathing, toileting and taking medications) to derive a score of zero to three. For preadmission mobility, the patient was recorded as requiring assistance if they were receiving supervision or physical assistance to mobilize indoors, regardless of mobility aid use (including wheelchair). We recorded presence of preadmission vision and hearing difficulties if the patient had a visual impairment that was not corrected with regular corrective lenses, or if the patient had hearing loss.

Concerns and issues regarding managing in the community. We derived a dichotomous variable from narrative notes in either the community home care report (if present) or admission notes to indicate if there were concerns or issues with meeting the patient's needs in the community. Issues or concerns were considered broadly as any situation that a health care professional, family member, or the patient indicated was interfering with the patient's needs being met in their current environment. We included individual-level issues, caregiving issues, social issues, issues related to needing or waiting for new services or setting, and family concerns.

7.3.4.3 In-hospital variables.

Hospital interventions. This dichotomous variable indicated if the patient had at least one of the following interventions during the hospital stay: biopsy, cardioversion, chemotherapy, dialysis, endoscopy, feeding tube, heart resuscitation, paracentesis, or ventilation.

Health status. This was derived as for preadmission status but included only the diagnoses that were recorded as being treated during the admission. As per CIHI coding guidelines, co-morbidity codes are assigned only when the condition "requires treatment beyond maintenance of the pre-existing condition", "increases the length of stay by at least 24 hours", *or* "significantly affects the treatment received" (p. 28, CIHI, n.d.). The medication count was derived from discharge medication reconciliation records and then dichotomized (5 or less; 6+).

Cognition and behavior. Orientation at discharge from hospital was used as a measure of cognition. Orientated times three (Ox3) indicates the patient is alert and aware of person (themself), place, and time. Orientation was coded as impaired if the score was oriented times two (Ox2) or less. Challenging behaviors in hospital was coded the same as for preadmission behavior but included only behaviors documented during the hospital stay, and included agitation that put the patient at high risk of personal injury (such as falls).

Continence and function. Incontinence was coded as present if the last nursing recording of urinary function indicated partial or full urinary incontinence. Needing assistance with toileting was coded using the last recording of toileting capacity in nursing or occupational therapy notes (including supervision and/or physical assistance). We determined need for assistance for mobility at discharge by referring to physical therapy discharge recommendations, or if not present, the last occupational therapy or nursing note that recorded mobility assistance. Fall risk was determined using the highest Schmid fall risk score recorded during the hospitalization. The Schmid fall risk-screening tool is completed by nurses on admission and weekly thereafter, and in previous research was been found to have 83-99% inter-rater reliability (Schmid, 1990). The tool's recommended cut-off is three (for clinical intervention purposes), but due to low numbers of patients with a Schmid score of two or under in this sample, we used a cut-off of five to develop a dichotomous fall risk variable.

7.3.4.4 Potentially avoidable health care use.

We used three different dichotomous outcomes to represent potentially avoidable health care use. The first outcome was discharge to an institutional setting (rehabilitation or nursing home) or discharge home with home care upon hospital discharge. The second outcome was whether or not the patient was given an ALC designation, which is an indicator of inappropriate hospital use (CIHI, 2009). Hospital ward health care staff assigns ALC status when the patient no longer requires the intensity of acute hospital services but cannot be discharged. This includes patients awaiting placement to an alternate setting like long term care, waiting for services to be set up for discharge, or cannot leave hospital due to social circumstances (CIHI, 2015). The final outcome was length of stay; a simple count of days from the date of hospital admission that was then dichotomized into under 30 days, or 30 days and over. Longer lengths of hospital stay increase the likelihood of adverse effects on older adults such as functional decline, infection, negative psychological consequences, and injury from falls (Admi, Shadmi, Baruch & Zisberg, 2015). Correlations confirmed that the three outcome variables were correlated, but not redundant with each other (Spearman rho ranged from .51 to .76).

7.3.5 Data analysis.

Data was downloaded from REDCap into IBM SPSS Statistics Version 24. Descriptive statistics were performed of all the demographic, social, preadmission and hospital variables, stratified by the three outcomes of interest. Bivariate associations were tested for statistical significance using chi square tests for dichotomous variables and the Student’s t-tests for continuous variables. Variables with a statistically significant association with at least one of the three outcomes at a p value of 0.05 or less were included in multivariate analyses. We used multivariate logistic regression to identify factors associated with each of the three outcomes for both preadmission and in-hospital variables, respectively. Demographic and social variables that were statistically significant in the bivariate analyses were also included in the multivariate analyses.

7.3.6 Post Hoc Analysis.

Given that the *preadmission concerns* variable was strongly associated with all outcomes, we wanted to explore these effects further. Therefore, we analyzed the concerns noted in the patient records thematically, with five major themes emerging. The themes and examples were:

Difficult to manage symptoms or behaviors: Patient-level issues such as unmanaged pain or breathlessness, impulsive behaviors, and/or safety issues such as frequent falls, or forgetting medication.

Informal caregiver issues: Caregiver burn-out, capacity issues for carrying out caregiving tasks, or is no longer able to provide care.

Considering different services or setting to better meet patient's needs: There were unmet needs for which services or a different setting were being considered (e.g. assisted living, nursing home, start or increase in home care services).

Waiting for new services or setting to be in place: A formal assessment for services/setting had been completed but was not in place prior to hospital admission.

Declines health professional recommendations for services or different care setting: The patient and/or family declined services such as Lifeline, home care, initiation of paperwork for nursing home.

Each patient was categorized in terms of the presence or absence of each of these themes and may have been included in more than one *concerns* variable. For example, a patient waiting to be admitted from community to nursing home may also have a burnt-out caregiver, and therefore would be included in two of the five variables. We then conducted chi-square analyses for each of the five dichotomous preadmission variables with each of the three outcomes.

7.4 Results

The characteristics of the overall sample and stratified by the three outcomes are provided in Table 6.1. Approximately half of the study sample was over 80 years old, lived in a low-income neighborhood, and lived alone. As is typical with an older adult population, women were over-represented, with 59.3% of the sample being female. Approximately three quarters of the sample spoke English at home, and had at least one identified informal care provider. Most of the patients were already known to community health services, with 90.2% enrolled in the publicly funded home care program.

Table 7.1 Sample characteristics and bivariate analyses

Characteristics	**All (n=214)**	**Discharged to an institution** (nursing home/rehabilitation vs. home with home care)			**Alternate level of care**			**Length of hospital stay** (over or under 30 days)		
	%(n) or mean± SD	**Yes (n=62)**	**No (n=152)**	**p value**	**Yes (n=70)**	**No (n=144)**	**p value**	**Long (n=59)**	**Short (n=155)**	**p value**
Demographic and Social										
Over 80 years of age	47.2 (101)	**61.3 (38)**	**41.4 (63)**	**.008**	**60.0 (42)**	**41.0 (59)**	**.009**	52.5 (31)	45.2 (70)	.33
Female	59.3 (127)	59.7 (37)	59.2 (90)	.95	57.1 (40)	60.4 (87)	.65	57.6 (34)	60.0 (93)	.75
Low income ($24,000 and under)	49.5 (106)	50.0 (31)	49.3 (75)	.93	51.4 (36)	48.6 (70)	.70	52.5 (31)	48.4 (75)	.59
Speaks English at home	76.6 (164)	82.3 (51)	74.3 (113)	.21	82.9 (58)	73.6 (106)	.13	79.7 (47)	75.5 (117)	.52
Lives alone	49.5 (106)	**67.7 (42)**	**42.1 (64)**	**.001**	**34.3 (42)**	**44.4 (64)**	**.03**	55.9 (33)	47.1 (73)	.25
Has informal care provider	74.3 (159)	69.4 (43)	76.3 (116)	.29	71.4 (50)	75.7 (109)	.50	78.0 (46)	71.1 (113)	.45
Preadmission										
Enrolled in home care	90.2 (193)	85.5 (53)	92.1 (140)	.14	88.6 (62)	91.0 (131)	.58	93.2 (55)	89.0 (138)	.36
Number of body systems impacted	1.07±1.02	1.04±1.09	1.09 ±1.0	.81	1.21±1.14	1.00 ±.95	.15	**1.4 ±1.2**	**.94 ±.91**	**.002**
Preadmission mental/behavioral diagnosis	11.2 (24)	**22.6 (14)**	**65.8 (10)**	**.001**	**22.9 (16)**	**5.6 (8)**	**<.001**	**27.1 (16)**	**5.2 (8)**	**<.001**
Six or more medications (n=210)	65.7 (138)	62.3 (38)	67.1 (100)	.50	63.8 (44)	66.7 (94)	.68	65.5 (38)	65.8 (100)	.97
Cognitive impairment	35.0 (75)	**51.6 (32)**	**28.3 (43)**	**.001**	**47.1 (33)**	**29.3 (42)**	**.002**	**47.5 (28)**	**30.3 (47)**	**.02**
Challenging behavior	9.8 (21)	**19.4 (12)**	**5.9 (9)**	**.003**	**21.4 (15)**	**4.2 (6)**	**<.001**	**20.3 (12)**	**5.8 (9)**	**<.001**

Characteristics	**All (n=214)**	**Discharged to an institution** (nursing home/rehabilitation vs. home with home care)			**Alternate level of care**			**Length of hospital stay** (over or under 30 days)		
	%(n) or mean± SD	**Yes (n=62)**	**No (n=152)**	**p value**	**Yes (n=70)**	**No (n=144)**	**p value**	**Long (n=59)**	**Short (n=155)**	**p value**
Incontinent	35.5 (76)	45.1 (28)	31.6 (48)	.06	**47.1 (33)**	**29.9 (43)**	**.01**	39.0 (23)	34.2 (53)	.51
Adl dependency (count of 3 adl)	1.61 ±1.05	1.5±1.07	1.65 ±.1.04	.34	1.49±1.06	1.67± 1.04	.65	**1.34 ±.98**	**1.71 ±1.06**	**.02**
Needs assist to mobilize indoors	15.0 (32)	17.7 (11)	13.8 (21)	.47	18.6 (13)	13.2 (19)	.30	18.6 (11)	13.5 (21)	.35
Vision or hearing difficulties	30.8 (66)	**50.0 (31)**	**23.0 (35)**	**<.001**	**41.4 (29)**	**25.7 (37)**	**.02**	**44.1 (26)**	**25.8 (40)**	**.01**
Concerns or issues in community	49.5 (106)	**72.6 (45)**	**40.1 (61)**	**<.001**	**68.6 (48)**	**40.3 (58)**	**<.001**	**74.6 (44)**	**40.0 (62)**	**<.001**
In-hospital										
Flagged intervention	13.1 (28)	11.3 (7)	13.8 (2)	.62	10.0 (7)	14.6 (21)	.35	4.2 (9)	12.3 (19)	.56
Number body systems impacted	2.8±1.4	2.9±1.6	2.8±1.3	.66	3.06 ±1.54	2.73 ±1.31	.32	**4.1±1.8**	**3.1 ±1.4**	**<.001**
New mental/behavioral diagnosis	21.0 (45)	**40.3 (25)**	**13.2 (20)**	**<.001**	**55.7 (39)**	**16.0 (23)**	**<.001**	**42.4 (25)**	**12.9 (20)**	**<.001**
Six or more medications at discharge	75.7 (162)	74.2 (46)	76.3 (116)	.74	72.9 (51)	77.1 (111)	.50	78.0 (46)	74.8 (116)	.63
Disorientation at discharge	30.8 (66)	**58.1 (36)**	**19.7 (30)**	**<.001**	**55.7 (39)**	**18.8 (27)**	**<.001**	**62.7 (37)**	**18.7 (29)**	**<.001**
Challenging behaviors	32.2 (69)	**46.8 (29)**	**26.3 (40)**	**.004**	**44.3 (31)**	**26.4 (38)**	**.01**	**59.3 (35)**	**17.4 (27)**	**<.001**
Incontinent at discharge	30.4 (65)	**43.5 (27)**	**25.0 (38)**	**.007**	**52.9 (37)**	**112 (77.8)**	**<.001**	**55. 9 (33)**	**20.6 (32)**	**<.001**
Needs help with toileting at discharge	35.0 (75)	**64.5 (40)**	**23.0 (35)**	**<.001**	**62.9 (44)**	**31 (21.5)**	**<.001**	**64.4 (38)**	**23.9 (37)**	**<.001**
Needs help to mobilize at	37.9 (81)	**69.4 (43)**	**25.0 (38)**	**<.001**	**64.3 (45)**	**25 (36)**	**<.001**	**62.7 (37)**	**28.4**	**<.001**

Characteristics	**All (n=214)**	**Discharged to an institution** (nursing home/rehabilitation vs. home with home care)			**Alternate level of care**			**Length of hospital stay** (over or under 30 days)		
	%(n) or mean± SD	**Yes (n=62)**	**No (n=152)**	**p value**	**Yes (n=70)**	**No (n=144)**	**p value**	**Long (n=59)**	**Short (n=155)**	**p value**
discharge									**(44)**	
Schmid fall risk score 5+	44.4 (95)	**64.5 (40)**	**36.2 (55)**	**<.001**	**87.1 (61)**	**69.4 (100)**	**.005**	**78 (46)**	**31.6 (49)**	**<.001**

Associations calculated with chi square (x^2) for categorical variables and Student's t-test for continuous variables.
Variables used in multivariate analysis are bolded (significant at p ≤ .05).

In terms of the outcome variables, 29.0% of patients were discharged to an institution, 32.7% were coded as ALC, and 27.6% had a length of stay longer than 30 days. Bivariate analyses showed many commonalities in the variables associated with the three outcomes. For example, among preadmission variables, the presence of a mental or behavioral diagnosis, cognitive impairment, challenging behaviors, vision or hearing difficulties, and concerns about managing in the community were associated with poorer outcomes for all measures. Multivariate analysis of the preadmission variables and the three outcomes are presented in Table 7.2. The odds of being discharged to an institution versus to home with home care was increased for those living alone, with the presence of a preadmission mental or behavioral diagnosis, having vision or hearing difficulties, and concerns about managing in the community. The variables associated with ALC were similar to those for the discharge destination outcome except that challenging behavior was also associated with ALC, whereas vision and hearing difficulties were not. Length of stay was only associated with having a preadmission behavioral or cognitive diagnosis, and concerns about the patient managing in the community.

Table 7.2 Multivariate logistic regression of preadmission predictor variables

Characteristics	**Discharged to institution**		**Alternate level of care**		**Over 30 day length of stay**	
	OR	**95% CI**			**OR**	**95% CI**
Over 80 years of age	1.61	.77-3.36	**2.03***	**1.01-4.06**	-	-
Lives alone	**4.35****	**1.99-9.52**	**2.60****	**1.28-5.22**	-	-
Number body systems impacted	**-**	**-**	-	-	1.35	.93-1.95
Preadmission mental/behavioral diagnosis	**4.04****	**1.41-11.53**	**5.05****	**1.75-14.57**	**3.78***	**1.25-11.42**
Cognitive impairment	1.74	.80-3.77	1.08	.52-2.25	1.04	.48-2.28
Challenging behavior	2.62	.83-8.23	**5.06****	**1.60-15.97**	2.18	.74-6.38
Incontinent	1.47	.70-3.09	1.83	.91-3.67	-	-
ADL dependency	-	-	-	-	.86	.61-1.23
Vision or hearing difficulties	**2.16***	**1.05-4.47**	1.23	.61-2.50	1.94	.96-3.94
Concerns about managing in community	**3.14****	**1.49-6.62**	**2.46****	**1.24-4.89**	**3.52****	**1.67-7.45**

*significant at p ≤ .05

**significant at p ≤. 01

- Was not included in multivariate modeling as was not significant in bivariate analysis.

a. Significant results are bolded.

In the post hoc analysis of preadmission concerns, difficult to manage symptoms or behaviors, waiting for services, and declining recommendations was significantly associated with discharge to an institution. Difficult to manage symptoms or behaviors and waiting for services was also associated with ALC, and difficult to manage symptoms or behaviors, informal caregiver issues and declining recommendations was associated with longer length of stay (see Table 7.3). Results for the multivariate analysis of in-hospital variables and the three outcomes are presented in Table 7.4. The odds of being discharged to an institution increased for those who lived alone, were diagnosed with a mental/behavioral condition in hospital, were not fully oriented at discharge, and needed assistance with toileting and mobilizing. The same variables were significant in the ALC model, except that orientation at discharge was not significant. A different pattern emerged for the outcome of length of stay; the odds of having a long length of stay was higher for those with more body systems impacted, with difficult behaviors, and having a higher fall risk. Similar to the other two outcomes, the need for assistance for toileting was an independent predictor of long length of stay.

Table 7.3 Post-hoc analysis: Associations between community concerns and issues and potentially avoidable health care use

Category of Concerns or Issues	**Total (n=214)**	**Discharged to an institution**			**Alternate level of care**			**Length of hospital stay**		
	(%, n)	**Yes (n=62)**	**No (n=152)**	**p value**	**Yes (n=70)**	**No (n=144)**	**p value**	**Long (n=59)**	**Short (n=155)**	**p value**
Difficult to manage symptoms or behaviors.	20.1 (43)	**37.1 (23)**	**13.2 (20)**	**<.001**	**32.9 (23)**	**13.9 (20)**	**.001**	**37.3 (22)**	**13.5 (21)**	**<.001**
Informal caregiver issues.	15.9 (34)	22.6 (14)	13.2 (20)	.09	21.4 (15)	13.2 (19)	.12	**25.4 (15)**	**12.3 (19)**	**.02**
Considering different services or setting to better meet patient's needs.	12.1 (26)	11.3 (7)	12.5 (19)	.81	14.3 (10)	11.1 (16)	.51	16.9 (10)	10.3 (16)	.19
Waiting for new services or setting to be in place.	11.2 (24)	**21.0 (13)**	**7.2 (11)**	**.004**	**18.6 (13)**	**7.6 (11)**	**.02**	15.3 (9)	9.7 (15)	.25
Declines health professional recommendations for services/ different care setting	9.3 (20)	**16.1 (10)**	**6.6 (10)**	**.03**	14.3 (10)	6.9 (10)	.08	**18.6 (11)**	**5.8 (9)**	**.004**

a. Associations calculated with chi square statistics (x$^{2)}$.
b. Significant results are bolded.

Table 7.4 Multivariate logistic regression of in-hospital predictor variables

Characteristics	**Discharged to institution**		**Alternate level of care**		**Over 30 day length of stay**	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Over 80 years of age	1.06	.46-2.45	1.22	.56-2.64	-	-
Lives alone	**7.98****	**3.14-20.28**	**3.49****	**1.59-7.68**	-	-
Number body systems impacted	-	-	-	-	**1.46****	**1.42-1.88**
Mental/behavioral diagnosis	**2.38**	**1.14-7.36**	**2.96***	**1.22-7.20**	1.76	.72-4.28
Disorientation at discharge	**3.59***	**1.37-9.37**	2.33	.98-5.53	2.11	.86-5.18
Challenging behaviors	1.00	.41-2.48	.77	.32-1.81	**1.80****	**1.34-7.43**
Incontinent at discharge	.74	.29-1.88	1.07	.46-2.52	.340	.60-3.66
Needs help with toileting	**4.45****	**1.72-11.55**	**3.72****	**1.55-8.92**	**2.86***	**1.10-7.41**
Needs help to mobilize	**4.77****	**1.89-12.03**	**2.57***	**1.11-5.95**	1.87	.76-4.58
Fall risk	1.34	.53-3.36	2.19	.95-5.03	**2.89***	**1.20-6.97**

*significant at $p \leq .05$

**significant at $p \leq .01$

- Was not included in multivariate modeling as was not significant in bivariate analysis.

a. Significant results are bolded

7.5 Discussion and Implications

The aim of this study was to identify older adults that could benefit from integrated care. We accomplished that goal by focusing specifically on hospitalized older adults who needed continuing care on discharge. In this way, we were able to examine a group of older adults with high health service needs to determine who may benefit from more specialized integrated services. Chart review methods allowed for examination of a breadth of variables in a vulnerable group from whom primary data collection would be challenging. Even though 90% of the older adults in this study were already enrolled in the provincial home care program prior to hospital admission, approximately 30% of the sample had the potentially avoidable outcomes of ALC (32.7%) or being discharged to an institution (29.0%), even after adjusting for medical need. Approximately 30% of the sample, therefore, may be able to avoid or reduce hospital and institutional health care use with robust community management. Even in cases where hospital use is unavoidable due to difficult to manage chronic conditions, the high health care users identified in this study would benefit from integrated care, as one of the primary goals of this approach is to provide seamless care between different levels of healthcare. For individuals who require periodic acute care intervention, integrated care provides the benefit of ensuring that care is consistent between primary and acute care providers for the individual receiving care, and from a systems perspective, ensures that the acute care use is efficient.

A main finding of this study was the strong influence of behavioral and/or cognitive diagnoses and symptoms on the potentially avoidable health care use outcomes. The influence of delirium, dementia, and severe mental illness on length of stay and institutionalization (Carter et al., 2016; Fick et al., 2013; Harrison et al., 2017; Jackson, Wilson, Richardson & Lord, 2016; Saravay & Iavin, 1994) has been known for some time. This study demonstrates that this association persists within a group of older adults who all have continuing care needs. Further, this study re-emphasizes the importance of considering mental as well as physical needs of older adults in health service design and delivery. Health care systems continue to silo acute services into psychiatric and physical services, and in the community, primary care services focus primarily on physical health (Domino et al., 2016). Mental illness decreases the capacity of older adults to self-manage physical conditions, such as learning or remembering how to use respiratory medications, or monitor heart failure symptoms. In the case of delirium, while thought of as a temporary condition, its effects can last up to 12 months (Wass, Webster & Nair, 2008). Therefore, community services for older adults need to have capacity for managing physical and mental health in tandem.

A second main finding was that preadmission issues and concerns of health care professionals were very common in this sample, and predicted potentially avoidable health care use. The post hoc analyses indicated that at-risk individuals are identifiable by health care professionals. For example, concerns expressed pre-admission with difficult to manage symptoms and behaviors were associated with institutionalization, ALC, and long lengths of stay. Similarly, informal caregiver issues, such as caregiver burden were associated with long lengths of stay. These findings are important from a clinical perspective, as it suggests that the opinion of a community health professional may be just as useful as clinical indicators or specialized screening tools in determining risk.

The nature of the concerns and issues expressed by community care professionals and family elucidates the features of integrated care that would be beneficial to the older adults in this study. At a macro level, integrated care approaches emphasize the need for a psychosocial as well as medical approach to care (Brown & Menec, 2018a; Chappell & Hollander, 2013;

Threapleton et al., 2017). The patients in this study had psychosocial needs including mental and behavioral needs, social support needs, and need for support for informal caregivers, all of which are prioritized in an integrated care approach. Integrated care approaches also tend to work best when a single funding envelope is used to provide and move care across and between health and social services. This allows all settings to have access to flexible funding, rather than one setting being prioritized or competing against another for financial resources (Chappell & Hollander, 2013), and could minimize waiting times for service increases.

At a clinical level, integrated care approaches use case managers that provide care across settings for continuity (Brown & Menec, 2018a; Chappell & Hollander et al. 2013; Threapleton et al., 2017). An ongoing relationship between an intensive case manager and the patient could have allowed for earlier intensive intervention implementation for patients with difficult to manage symptoms or behaviors, the development of trust with older adults and families reluctant to accept services, ongoing support for informal caregivers, and a liaison between settings for needed hospital admissions. Also at a clinical level, integrated care uses interprofessional teams that deliver rehabilitative and restorative care in the community to best manage problematic symptoms and behaviors, and reduce the need for hospital convalescence (Brown & Menec, 2018a; Threapleton et al., 2017).

Independent predictors of potentially avoidable hospital outcomes that were similar to other studies of hospitalized older adult populations were: living alone (Sansosi et al., 2015), dementia and other mental conditions (Bressi-Nath & Marcus, 2012; Fick et al., 2014; Harrison et al., 2017; Prina et al., 2013; Zekry, 2012; Vivanco & Roberts, 2011), cognitive impairment (Sansosi et al., 2015), and functional dependency (Harrison et al., 2017; Sansosi et al., 2015: Vivanco & Roberts, 2011). Only for the outcome of long length of stay was multimorbidity

(Sansosi et al., 2015; Vivanco & Roberts, 2011) and falls also independent predictors that have been previously identified (deBuyser et al., 2014).

Independent predictors of undesirable hospital outcomes in other studies that were not replicated here were medication use (deBuyser et al., 2014; Sansosi et al., 2015), gender (Harrison et al., 2017), low income (Sansosi et al., 2015) and ethnicity (as represented by language in this study) (Sansosi et al., 2015). These factors may be less relevant for patients that have high health care needs and already require continuing care.

The present study has several limitations. The results need to be generalized to other settings with caution since the sample is from a single setting. Examining the demographic, social, health and functional profile of this sample can help to determine to what extent the findings of this study are generalizable to other contexts. An unavoidable limitation of chart review methodology is the inability to verify the information documented in charts (Gearing, Mian, Barber, & Ickowicz, 2006). However, multiple strategies were used to ensure that the data extracted from charts was high quality, including consultation with site-specific clinicians regarding patient documentation, development of abstraction protocols and guidelines, careful selection, training and monitoring of a data abstractor, protocols for managing ambiguous, conflicting and/or missing data, conducting a pilot study of approximately 10% of the target sample, and measurement of inter-rater reliability (Gearing, Mian, Barber, & Ickowicz, 2006). We were not, however, able to blind abstractors to the three studied outcomes, as this information is embedded in charts in multiple locations. Finally, some of the variables in post hoc analyses may be under-powered, resulting in Type 2 errors.

7.6 Conclusion

This study identified and characterized an older adult population with high health and social needs that may benefit from specialized integrated supports to reduce hospital use, nursing home admission, or at minimum, ease care transitions between acute and non-acute care settings. Potentially high users have mental, behavioral, and social as well as physical health issues, and may be identifiable via reporting of issues and concerns by community health care professionals as a proxy for risk screening.

7.7 Author's Note.

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Chapter 8: Linking Chapter

The previous chapter took a health care system perspective to determine which older adults may benefit from targeted resource-intense initiatives that integrate care in one or more domains (financial, administrative, organizational, service delivery and/or clinical). The following chapter hones in on clinical integrated care specifically. In the study that follows, I aimed to develop a measurement tool to assess the presence and extent of integrated care in day-to-day care delivery to support care transitions. This work addresses a gap in integrated care literature, as there is a lack of non-questionnaire tools to measure clinical-level integrated care (Janse et al., 2016; Strandberg-Larsen & Krasnik, 2009; Suter et al., 2017). The specific objective being addressed was:

Objective 3: To explore the feasibility of indicators for determining the extent and variation of clinical-level integrated care delivery for supporting older adult care transitions.

It is hoped that the development of these indicators will eventually allow for measuring the extent to which integrated care practices are being implemented in clinical settings, in addition to assessing potential variation in the integrated care received between patients.

The next manuscript introduces the concept of health care microsystems. Nelson and colleagues (2002) argue that quality health care is highly dependent on the small front-line units (“microsystems”) of health care. Hospital wards can be considered microsystems of front-line providers that provide care to a specific sub-group of patients. Microsystems (in this case wards) are complex systems that, over time, adapt to the needs of the patients, the internal needs of the unit, as well as the macro-system in which they are embedded. Since each hospital ward (microsystem) is unique, each one may have adapted differently to day-to-day demands. Since the purpose of developing the clinical integrated care indicators is to look at quality of care, I compared indicators across wards to examine potential microsystem effects.

Chapter 9:Indicators for Integrated Care Delivery: Development and Feasibility

9.1 Abstract

Introduction/Background: There is little evidence regarding the extent to which integrated care manifests in day-to-day care delivery for older adults. We explored the feasibility of developing indicators of clinical integrated care, and examined the extent and variation of integrated care delivery in relation to care transitions between the hospital and the community.

Theory and Methods: Existing integrated care frameworks, and literature that used systematic methods for establishing the elements of integrated care, were used to develop indicators. Data were extracted from 214 medical records of hospitalized older adults. For indicators deemed reliable, we determined: the percentage of patients who met the criteria for each integrated care indicator; relationships between indicators and personal characteristics; and variation in integrated care across hospital wards.

Results: Of twenty-eight initially developed indicators, twenty-two were acceptable for analysis. The percent of patients who were classified as receiving clinical integrated care varied widely across indicators, from 0.05% to 84.1%. There were statistically significant differences between twelve indicators and personal characteristics (living alone, function). For seven indicators, the variation between wards exceeded 50%.

Conclusion: A strong conceptual literature base on integrated care promoted the development of a framework and 28 related indicators that can be adapted for future research and program evaluation.

Key Words: care transitions, older adults, integrated care, indicators

9.2 Introduction

Care transitions for older adults between the hospital and the community are associated with adverse events (Forster et al., 2003; Forster et al., 2004), hospital readmissions (Monette, 2012; CIHI, n.d.), and poor communication and continuity of care (Knight, Thompson, Mathie & Dickinson, 2011). Integrated care models suggest that integration between primary and tertiary care, as well as social and health care is important for reducing unnecessary acute care use and smoothing transitions between hospital and community care settings. However, there is little evidence regarding the extent of integrated care occurring in day-to-day care delivery (Janse, Huijsman, De Kuyper & Fabbricotti, 2016).

The advantage of integrated care models is their breadth. However, this breadth contributes to the complexity of measuring integrated care. Integrated care has dual goals of improving both system efficiency, as well as patient outcomes. To look at the impact of integrated care at the system level, outcomes such as readmissions (Lee et al., 2015, Titova, Steinshamn, Indredavik, Henriksen, 2015), emergency room use (Lee et al., 2015, Roland et al., 2012), institutional health care costs (Asmus-Szepsi et al., 2015; Roland et al., 2012), and length of stay (Lin, Wang, Chang, & Yang, 2015; Preen et al., 2005) have been used. For patient outcomes, the most commonly investigated domains have been health (Bergmo, Berntsen, Dalbakk, & Rumpsfeld, 2015; Buurman et al., 2010; Eklund et al.,2013), function (Asmus-Szepsi et al., 2015; Buurman et al., 2010; Eklund et al., 2013), and quality of life (Buurman et al., 2010; Wong, Ho, Yeung, Tam, & Chow, 2011). With the more recent emphasis on patient-centredness in integrated care models, patient satisfaction as measured with questionnaires has also become a commonly measured outcome of integrated care (Altfeld, Pavle, Rosenberg, & Shure, 2012; Holstege et al., 2015; Lee et al., 2015; West London Clinical Commissioning Group, 2015).

Although outcome measures are important, we also need to have integrated care process measures to be able to determine the extent to which patient care is integrated. This is particularly important for integrated care interventions, as they require cultural shifts and changes in daily practices for multiple health professionals who may not interact regularly (Hjelmar, Hendriksen & Hansen, 2011). At least one initiative has published their challenges with the implementation of integrated care due to lack of buy-in from all involved providers (Hjelmar et al., 2011). Evaluating whether or not integrated care was delivered as intended is important.

For older adults moving between care settings, there has been little focus on measuring the extent of integration achieved. A handful of studies have looked at the extent and impact of integration from the provider perspective (Bäck & Calltorp, 2015; Holstege et al., 2015; RAND Europe, 2012; Thistlewaite, 2011), and the patient perspective (Holstege et al., 2015; RAND Europe, 2012) using questionnaires or interviews. However, there is a gap in the use of objective measures to determine the extent of delivery of integrated care to older adults transitioning between care settings (Janse et al. 2016).

Quality indicators are criteria used to examine the quality of health care (Campbell, Braspenning, Hutchinson, & Marshall, 2003). “They are designed to compare actual patient care to ideal criteria” (p. 1322, Stelfox & Straus, 2013,) for quality improvement and/or research. Quality indicators are explicitly defined and measurable, and can address either process or outcomes of care (Campbell et al., 2003). Quality indicators are selected based on their importance in relation to the type of care being evaluated, scientific soundness, and feasibility (Arah, Westert, Hurst & Klazinga, 2006). Typically, systematic approaches to developing indicators use a combination of expert opinion and evidence from the literature. The ability to focus on processes of care, and the ability to measure components of a broad concept makes indicators a good option for measuring the delivery of integrated care.

Patient charts are a readily accessible rich data source that can be used for collecting indicators of quality care. Using patient charts, more information can be collected than what can be feasibly collected with primary data collection, and they provide more in-depth information than administrative health care data, such as hospital discharge abstracts (Gearing, Mian, Barber, & Ickowicz, 2006). Furthermore, chart review ensures that the entire population of interest that is receiving care within the health care system is included (Gearing et al., 2006).

The purpose of this study was to determine the feasibility of developing process indicators for examining the extent and variation of clinical integrated care delivery to older adults transitioning from the hospital to the community with continuing care needs. This paper: 1) outlines the development of clinical process integrated care indicators for care transitions of older adults transitioning between the hospital and community, and, 2) presents results of the extent and variation of clinical integrated care using the process indicators with one sample of older adults transitioning between the hospital and home.

9.3 Development of conceptual framework and indicators.

A conceptual framework can be helpful for guiding the development of indicators (Stelfox & Straus, 2013). Figure 9.1 provides a visual display of the framework we developed for this purpose. The development was iterative but will be described as steps for clarity. The first step was identifying the foundational features of integrated care relevant to care transitions. We used three frameworks to achieve this. The first is the Hollander and Prince (2007) Enhanced Continuing Care Framework (ECCF), which conceptualizes an ideal integrated care system for older adults with continuing care needs. It is primarily a top-down model; it outlines philosophical and policy prerequisites that provide a base for the development and application of best practices of continuing care, such as client-centred care, a commitment to a full range of services, and sustainable funding. Best administrative and clinical practices then support the development of linkage mechanisms between different layers of the health system and other sectors providing care services, such as primary care, social care and hospital care. This model is helpful in emphasizing the importance of a shared philosophy across the entire system of care.

The second framework we drew from is the Kodner and Spreeuwenberg (2002) model. Since large organizations (such as hospitals and regional health authorities) tend to decentralize and divide service delivery to manage the complexity of the environment, Kodner and Spreeuenberg emphasize that cooperation and coordination is essential to prevent fragmentation both within and between programs and services (Kodner and Spreeuwenberg, 2002). This framework highlights the importance of bottom-up as well as top-down approaches, depending on the goals of integration. Kodner and

Spreeuwenberg provide specific examples of strategies that can be implemented along a macro (administration) to micro (clinical) continuum.

Finally, we used the Rainbow framework (Valentijn, Schepman, Opheij, & Bruijnzeels, 2013). It combines the key features of primary care and integrated care. The framework is based on the core value of primary care of being both person and population-focused. Thus it also reflects the need for integration at micro, meso and macro levels. It contributes to understanding integrated care by emphasizing the importance of holistic care by addressing biomedical, psychological and social dimensions of health. From these models, we identified the foundational concepts of: horizontal integration, vertical integration, patient-centred care, and a biopsychosocial approach to care all delivered within and between settings.

The next step involved developing domains that encapsulate the important features of clinical integrated care. We did this by grouping features that we found in systemically developed published elements of integrated care that would be relevant to clinical practice related to care transitions, and simultaneously considering the discharge planning literature on best practices (Parry, Min, Chugh, Chalmers, & Coleman, 2009; Jack et al., 2009). The first source was from a scoping review of integrated care practices for improving care transition outcomes (Brown & Menec, 2018a). The second source was a taxonomy generated from a literature review and a Delphi process with health care providers and administrators and that is framed with the Rainbow model of integrated primary care (Valentjin et al., 2015). The final source was elements of the development of integrated care developed through a literature review, and a Delphi process with 31 experts in integrated care, including researchers, project managers and managers

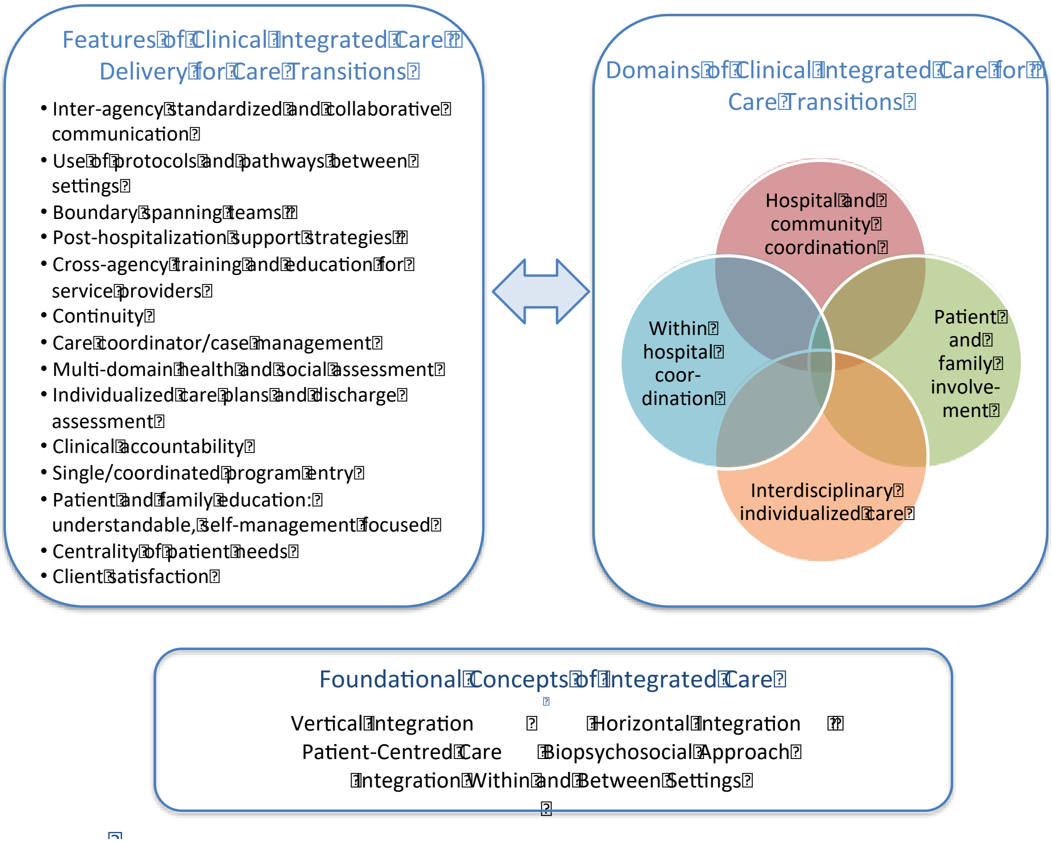
(Minkman, Ahaus, Fabbricotti, Nabitz, Huijsman, 2009). Based on a review of the above-mentioned literature, four domains and their definitions were used:

Hospital and community interaction for disposition planning: Vertical integration in the form of communication, or shared care, or other, with the purpose of providing continuity of care and a high quality plan of care to support care transitions *in and out* of the hospital.

Individualized multidisciplinary care plan: Development and implementation of a multidisciplinary discharge plan at the individual client level that is provided in the community or the hospital to assess and provide support for care transition needs.

Client and patient involvement in the disposition plan and process: Client/family education focuses on medical, psychological and social aspects of health. Client/family is pro-actively involved in transition plans. Information on the disposition plan or discharge instructions is unambiguous and understandable at the individual level (Valentjin et al., 2015).

Within-hospital coordination for disposition planning: Hospitals are complex environments; care needs to be coordinated among many care providers for the care transition to progress smoothly.



This framework was developed based on previous theoretical conceptualizations of integrated care and literature that identified features of integrated care.

Figure 9.1: Framework for development of clinical integrated care process indicators

9.4 Methods

9.4.1 Study context.

The chart sample was taken from a teaching hospital in a Canadian province. Canada has a universal health care system in which physician and hospital services are provided free of charge. This study focused on the interaction between the hospital and the community and thus the study setting includes the health care region within which the study hospital is situated, as well as the hospital itself. Since this study is focused on integrated care, a brief explanation of the integration in the setting of the study is provided here.

The health region of this study has some elements of integrated care at the macro level, such as overarching governance, and an administrative structure that operates across acute care centres, but has received critique for focusing too much on acute care to the detriment of the continuum of care. There is no integration of governance between the "cure and care sectors" (p. 3 Kodner & Spreeuweunberg, 2002). Generally, hospital services are bound to the hospital, and community services to the community, with little overlap between them. An exception is the home care program - a free of charge provincial home care program that supports people to stay in their home as long as possible. Upon admission to hospital, a hospital home care coordinator assumes care from the community home care coordinator, and assesses and organizes community home care needs before transferring care back to the community home care coordinator upon hospital discharge. Hospital and home care case coordinators work according to the same policies and procedures for care planning and delivery and share an electronic medical record. Home care coordinators also facilitate transitions to nursing homes. Nursing home admission is also based on a needs assessment. The cost of the nursing home is shared between the resident and government, with a daily resident rate calculated according to the individual's income.

In terms of within-hospital integration, the study hospital has multiple teaching and non-teaching wards that accept general medicine patients. Each ward has a different clinical manager, primary attending physician, and multidisciplinary team.

Overall, the vertical integration of the health region of this study is autonomous/coordinated, with a few linked/integrated features (Thistlewaite, 2011).

9.4.2 Sample and data collection.

We collected data from 214 hospital charts of older adults who were under the care of the general medicine service of the study hospital. Inclusion criteria were: age 65 or over at the time of hospital admission; living at home preadmission; and, either discharged home with home care, or transferred to institutional care, such as inpatient rehabilitation or nursing home. Patients who were residing in an institution prior to admission, or who died during the hospitalization were excluded. Starting in December, 2016, charts that met the study inclusion and exclusion criteria were pulled backwards in time, until the desired sample (minimum of 200) was reached. All patients had a discharge date between January 2014 and September 2016. In the case where an individual had multiple admissions that met the study criteria, we collected data from the most recent discharge.

9.4.3 Measures.

9.4.3.1. Integrated care.

Using the framework that we developed and described above (see Figure 9.1), we reviewed each of the integrated care clinical features (Brown & Menec, 2018a; Minkman et al., 2009; Valentjin et al., 2015) to determine those that were measurable at an individual patient level. From this, twenty-eight features were deemed relevant and phrased as process indicators (see Table 9.1). We then extracted data related to these indicators. We collected quantitative data, as well as qualitative data when there was no relevant quantitative data to address the indicator. We adapted the indicators to match the data available, if needed. The first main reason for adapting the indicators was to clarify exactly what was being measured. The second was to be able to measure a similar construct despite data limitations. The third was to maintain the ability to investigate variation between patients by aligning the indicator with the system under study. For example, in this health system, there are no care coordinators or case managers that provide care across settings (see Table 9.1), but there are setting specific care coordinators. Therefore, we adapted the indicator so that it would indicate if the patient had any type of care coordinator.

9.4.3.2 Personal Characteristics.

We collected information on personal characteristics; sex, whether or not the client lived alone, preadmission function and in-hospital function. The data collection methodology for personal characteristics is described elsewhere (Brown & Menec, 2018b). The two function variables were derived specifically for this paper. Preadmission function was a dichotomous variable derived from a raw count of domains (cognition, behavior, continence, ADLs, mobilizing indoors, and vision/hearing) in which the individual was intact/independent. High function was defined as having five or six of six domains intact. A similar approach was used for in-hospital function, although only 5 domains were available (cognitive orientation, behavior, continence, toileting and mobilizing). High function was defined as having all five domains intact.

Extraction procedures for the chart review used multiple strategies to ensure data fidelity and were informed by guidelines developed by Gearing and colleagues (2006), and Allison and colleagues (2000), the details of which have been described elsewhere (Brown & Menec, 2018b).

9.4.4 Data Analysis.

To determine the feasibility of using the extracted indicators, we calculated the proportion of missing values, the inter-rater reliability using thirty charts (14% of the sample), and the proportion of patients that met each integrated care indicator. As is recommended in the literature, we calculated the inter-rater reliability (IRR) using Cohen’s kappa, but also provide the percent agreement to aid in interpretation (Liddy, Wiens, & Hogg, 2011). There is agreement in the literature that a Cohen’s kappa of .61 is generally found to be acceptable, and so we chose this value as a cut-off (Liddy et al. 2011). For percent agreement, there is consensus that 95% agreement is high quality (Allison et al.; Liddy et al., 2011), but there is little guidance on lower levels of acceptability. Therefore, we chose 80% agreement and over as acceptable since this was a feasibility study. As such, indicators meeting minimal criteria for missing values (less than 25%), inter-rater reliability (IRR) (over .61 kappa and over 80 percent agreement), and with proportions higher than 10% (to ensure adequate cell count sizes) were included in further statistical analysis.

We used chi square analysis to determine relationships between the indicators and personal level characteristics. To determine clinical microsystem effects on the indicators, we compared the indicators across hospital wards. Clinical microsystems are “ small, functional, front-line units” that comprise the “building blocks of larger organizations” (p. 473, Nelson et al., 2002). They develop unique patterns of care based on relationships within their unit, as well as relationships with their patient sub-population and the larger organization. Therefore, the purpose of the ward analysis was to tease out if the indicators were representative of individual level care variation or rather, of variation in practices between hospital micro-systems (Nelson et al., 2002). We calculated indicator proportions for wards with at least 10 patients admitted and discharged. Thus, we included six wards to which the sample was admitted, and seven from which they were discharged.

9.5 Results

Table 9.1 displays details on the initial 28 process indicators as developed from the literature, and how each was implemented as proposed, adapted, or eliminated based on data availability. This process resulted in 25 indicators for statistical analysis. There were two main reasons for indicators to be completely dropped or adapted: 1) because the recommended service or practice was not in place, or used in the study setting, and thus would not provide information on individual patient care variation; or, 2) because of limitations in the available data, for example inconsistent documentation practices.

Table 9.1 Proposed and operationalized process indicators based on data availability

Indicator Developed from Literature	**Able to Oper-ationalize?**	**Operationalization (if applicable)**
1. The client receives care from a team that provides service across settings (Brown & Menec, 2018a).	AS	Preadmission, the client received care from a community-based or boundary-crossing multidisciplinary team.
2. Client has a consistent primary care provider (Brown & Menec, 2018a; Valentijn et al., 2015).	P	The client has a primary care physician (PCP) that is recorded upon hospital admission.
3. The client has a care coordinator that can coordinate care across settings (Brown & Menec, 2018a; Minkman et al., 2009; Valentijn et al., 2015).	AS	The client's home care coordinator wrote a report on the client within 1 and 6 months prior to hospital admission.
4. The client has a case manager that provides case management in any care setting (Brown & Menec, 2018a; Minkman et al., 2009; Valentijn et al., 2015).	AS	The client receives services from a private or public agency that has provided a case manager.
5. The client/family is receiving social service support in the community (including caregiver support, practical support like meals on wheels, social programming) (Valentjin et al., 2015).	AD	No informal care burn-out upon hospital admission. Receives subsidized cleaning or laundry services preadmission.
6. Client receives care from a hospital multidisciplinary team that has both a social and medical perspective (based on type of team members) (Brown & Menec, 2018a).	P	Hospital multidisciplinary team working with client during admission includes both social and medical perspective (team includes social worker, occupational therapist or geriatric clinician/geriatrician).
7. Client's risk assessed to determine level of care transition support need (Brown & Menec, 2018a; Minkman et al., 2009)	P	Hospital discharge screening tool completed.
8. Adequate preadmission information transferred from community to hospital staff about client to develop individualized discharge plan (Brown & Menec, 2018a).	ND	

Indicator Developed from Literature	Able to Oper-ationalize?	Operationalization (if applicable)
9. Timely information transmission of client's preadmission information for disposition planning (Brown & Menec, 2018a).	ND	
10. During hospitalization, communication occurs between the hospital and community agencies and services in order to coordinate the client's discharge plan (Brown & Menec, 2018a; Minkman et al. 2009).	A	During hospitalization, communication occurs between the hospital and any community agency or service (or in-reach service) that will assist the patient following hospitalization during the hospital stay.
11. The client has hospital provider continuity during the hospital stay (Brown & Menec, 2018a).	AS	Low number of attendings over course of stay (e.g. 2 or less; 3 or more).
12. Timely transfer of client's hospital discharge information to community providers (Brown & Menec, 2018a).	A	Discharge summary is available within one week of discharge. Discharge summary is cc'ed to the receiving PCP or institution. For those being discharged home, discharge prescription is faxed directly to pharmacy.
13. A shared multidisciplinary report is transferred to community providers (Minkman et al., 2009).	AS	Inclusion of non-medical information in discharge summary to support community care.
14. Client's post-hospital appointments scheduled prior to hospital discharge date (Brown & Menec, 2018a).	A	For those going home, appointment scheduled with PCP prior to discharge date.
15. Client provided with timely post-hospitalization support to ensure needs being met, determine if new needs (Brown & Menec, 2018a; Minkman et al., 2009).	A	For those going home, all recommended home care services in place upon hospital discharge. Referral made for post-hospital follow-up.
16. Cross-boundary client- specific education or training between health providers provided (Brown & Menec, 2018a).	P	Cross-boundary patient- specific education or training between health providers.
17. Client's chronic disease care is based on a multidisciplinary care pathway or guideline (Brown & Menec, 2018a; Minkman et al., 2009;	NS	

Indicator Developed from Literature	**Able to Oper-ationalize?**	**Operationalization (if applicable)**
Valentjin et al., 2015).		
18. Client's disposition planning was based on a multidisciplinary care pathway or guideline was used for (Brown & Menec, 2018a; Minkman et al., 2009; Valentjin et al., 2015).	NS	
19. Needed multidisciplinary team members for client's discharge planning are identified, and provide the needed service (Brown & Menec, 2018a; Minkman et al., 2009; Valentjin et al., 2015).	P	Multidisciplinary team involved during admission matches identified need on discharge screening tool.
20. The client's biopsychosocial care needs for discharge planning is discussed at regular multidisciplinary meetings (Brown & Menec, 2018a).	AD	Discharge planning form on chart to indicate that weekly discharge planning meetings occurred at some point in stay.
21. The client received multi-domain assessment of discharge needs and a plan to meet these needs (Brown & Menec, 2018a; Minkman et al., 2009; Valentjin et al., 2015).	AD	Written plan for team discharge planning within 7 days of admission. No outstanding assessments upon hospital discharge.
22. The client is involved in the discharge planning process (Brown & Menec, 2018a).	ND	
23. The client's family is involved in the discharge planning process (Brown & Menec, 2018a).	P	Inclusion of family in discharge planning.
24. Client and family provided with education about reason for medical stay and self care on discharge (Brown & Menec, 2018a; Valentjin et al., 2017).	AD	For those going home, provided with written discharge information form.
25. discharge instructions are individualized to the client's knowledge needs (Valentijn et al., 2015).	P	For those going home, discharge form includes instructions that are free of jargon.
26. Client is satisfied with the disposition plan (Valentijn et al., 2015).	ND	

Indicator Developed from Literature	**Able to Oper-ationalize?**	**Operationalization (if applicable)**
27. Client and family are provided with self-management education or referred to a self-management program for post-discharge care (Minkman et al., 2009; Valentijn et al., 2015).	ND	
28. Client's care needs are met regardless of program eligibility requirements (Minkman et al., 2009).	ND	

P=able to use as planned; A= adapted; AS=adapted because this service or practice was not in place/used in the studied health care setting; AD=adapted due to data limitations/availability; ND=not able to collect due to data limitations; NS=not able to collect because this service in not in place in the studied health care system.

Table 9.2 displays results for missing values, inter-rater reliability and the percent of the sample who were categorized as having integrated care on a particular indicator. Fifteen of the 25 indicators did not have any missing values, as not having anything recorded in the chart was considered a negative result; that is, not having integrated care. Otherwise missing value rates were low, as the indicators were already adapted from the originally planned indicators based on data availability. Four indicators had problematic IRRs (kappa=.22-.48; 66.7-73.3% agreement) that were not remediable, even after reviewing the data with improved coding instructions. There were seven other indicators that were either below .75 kappa or 90% agreement, indicating some challenges with data collection consistency. Four of these indicators required the abstractor to code qualitative data. One indicator had inadequate data for calculating an IRR, as the indicator was only met for individual. Including this indicator and the indicators with calculated acceptable IRRs, the percent of patients who were classified as having integrated care varied widely across the indicators, from 0.05% to 84.1%.

Table 9.2 Missing values, inter-rater reliability and proportion per indicator (n=214)

	Missing (%)	IRR		% met indicator
		% agree-ment	kappa	
Integrated Care Indicators				
1. Preadmission, the client received care from a community-based or boundary-crossing multidisciplinary team.	0	93.3	.83	22.0
2. The client has a primary care physician (PCP) that is recorded upon hospital admission.	0	100	1.00	70.6
3. The client's home care coordinator wrote a report on the client's status within 1 to 6 months prior to hospital admission.	7.0	96.7	.93	57.8
4. The client receives services from a private or public agency that provides a case manager in community.	0	86.7	.44	4.2
5. No informal care burn-out upon hospital admission.	0	93.3	.71	84.1
6. Receives subsidized cleaning or laundry services preadmission.	2.8	93.3	.87	49.0
7. Hospital multidisciplinary team working with client during admission includes both social and medical perspective (team includes social worker occupational therapist or geriatric clinician/geriatrician).	0	96.7	.87	80.8
8. Hospital discharge screening tool completed.	0	100.0	1.00	77.6
9. During hospitalization, communication between the hospital and any community agency or service (or in-reach service) that will assist the patient following hospitalization.	0	83.3	.86	27.1
10. Low number of attending physicians over course of stay (1 or 2).	0	100	1.00	75.7
11. Discharge summary is available within one week of discharge.	3.3	96.7	.93	39.8
12. Discharge summary is cc'ed to the receiving PCP or institution.	7.5	83.3	.66	56.6
13. For those being discharged home, prescription is faxed directly to pharmacy (n=147).	3.3	93.3	.90	70.1

14. Inclusion of non-medical information in discharge summary.	8.9	66.7	.33	58.9
15. For those going home, appointment scheduled with PCP prior to discharge date (n=143).	5.9	90.0	.80	32.2
16. For those going home, all recommended home care services in place upon discharge (n=143).	5.9	93.3	.93	76.2
17. For those going home, no outstanding assessments upon hospital discharge (n=214).	0	86.7	.66	79.0
18. Referral made for post-hospital follow-up (in addition to home care program) (n=152).	0	86.7	.59	15.8
19. Cross-boundary patient-specific education or training between health providers.	0	*	*	.05
20. Multidisciplinary team involved during admission matches identified need on discharge screening tool.	22.4	83.3	.70	36.0
21. Discharge planning form on chart to indicate weekly multidisciplinary discharge planning meetings occurred at some point in stay.	0	100	1.00	76.6
22. Written plan for team discharge planning within 7 days of admission.	0	73.3	.48	37.9
23. Inclusion of family in discharge planning.	2.8	90.0	.67	69.7
24. For those going home, client provided with written discharge information form (n=152)	0	93.3	.88	81.6
25. For those going home, discharge form includes self care and/or follow-up instructions that are free of jargon (n=152).	0	86.7	.80	46.1

*not calculated

Table 9.3 displays the analysis of indicators according to personal characteristics. Of the twenty-one indicators analyzed, twelve were significantly related to at least one of the personal characteristic variables. There was only one significant difference for the variable of sex; men were more likely to receive care from a multidisciplinary team preadmission. Five indicators were significantly associated with living alone. Those who lived alone were more likely to receive subsidized housekeeping services, and have an informal caregiver reporting burn-out upon hospital admission. Those living with one or more people were more likely to have a discharge summary available within one week of discharge, have all assessments completed at discharge and have family included in discharge planning.

Five indicators were significantly associated with preadmission function. Those with a lower level of function were more likely to have an involved care coordinator preadmission, have subsidized cleaning, and were more likely to have the hospital and community caregivers communicate with each other for care coordination. Those with a higher level of function were more likely to have a caregiver reporting burn-out on admission, and have a completed discharge screening tool on the chart. There were six indicators significantly associated with in-hospital function. Those with a lower level of function were more likely to have had a multidisciplinary team preadmission, to have hospital and community caregivers communicating for care coordination, have a discharge prescription faxed directly to the pharmacy, and to have family involved in discharge planning. Those with a higher level of function during the hospital stay were more likely to have a caregiver reporting burn-out on admission, and have a low number of attending physicians during the hospital stay.

Table 9.3 Relationships between integrated care indicators and personal characteristics

	Sex		**Living Status**		**Preadmission function**		**In-hospital function**	
Integrated Care Indicators	**Women**	**Men**	**Living with other(s)**	**Living alone**	**Low**	**High**	**Low**	**High**
1. Preadmission, the client received care from a community or boundary-crossing multidisciplinary team (n=214).	**17.3**	**28.7**	21.3	22.6	24.8	16.9	25.2	14.3
2. The client has a primary care physician (PCP) that is recorded upon hospital admission (n=214).	71.7	69.0	72.2	68.9	71.5	68.8	70.9	69.8
3. The client's home care coordinator wrote a report on the client's status within 1 to 6 months prior to hospital admission (n=199).	55.1	61.7	54.2	61.2	**69.0**	**37.1**	59.4	53.6
4. No documented informal care burn-out upon hospital admission (n=214).	87.4	79.3	**76.9**	**91.5**	**80.3**	**90.9**	**80.8**	**92.1**
5. Receives subsidized cleaning or laundry services preadmission (n=208).	53.3	43.0	**27.1**	**72.3**	**55.3**	**38.2**	49.3	48.4
6. Hospital multidisciplinary team working with client during admission includes both social and medical perspective (based on type of team members) (n=214).	81.9	79.3	82.4	79.2	83.9	75.3	**86.8**	**66.7**
7. Hospital discharge screening tool completed (n=214).	78.7	75.9	76.9	78.3	**73.0**	**85.7**	78.1	76.2
8. During hospitalization, communication between the hospital and any community agency	23.6	32.2	25.0	29.2	**32.1**	**18.2**	**32.5**	**14.3**

	Sex		Living Status		Preadmission function		In-hospital function	
Integrated Care Indicators	**Women**	**Men**	**Living with other(s)**	**Living alone**	**Low**	**High**	**Low**	**High**
or service that will assist the patient following hospitalization (n=214).								
9. Low number of attending physicians over course of stay (1 or 2). (n=213)	78.0	72.4	75.0	76.4	57.8	54.3	**69.5**	**90.5**
10. Discharge summary was available within one week of discharge. (n=205)	39.8	39.8	**48.0**	**32.1**	72.3	81.8	39.6	40.3
11. Discharge summary was cc'ed to the receiving PCP or institution. (n=197)	57.3	55.6	57.4	55.7	57.8	54.3	58.9	50.9
12. For those going home, discharge prescription was faxed directly to pharmacy. (n=147)	70.1	70.0	69.4	71.0	72.6	66.7	**76.7**	**59.6**
13. For those going home, appointment scheduled with PCP prior to discharge date. (n=143)	28.2	37.9	33.7	30.0	25.9	40.3	33.3	30.4
14. For those going home, all recommended home care services in place upon discharge. (n=143)	22.1	26.3	72.3	81.7	25.3	21.9	24.4	22.6
15. No outstanding assessments upon hospital discharge (n=214).	78.0	80.5	**85.2**	**72.6**	78.8	79.2	80.8	74.6
16. Multidisciplinary team involved during admission matches identified need on discharge screening tool (n=214).	36.2	35.6	35.2	36.8	32.1	42.9	35.8	36.5
17. Discharge planning form on chart to indicate weekly multidisciplinary discharge planning meetings occurred at some point in stay (n=213).	76.4	77.0	73.1	80.2	78.1	74.0	79.5	69.8
18. Written plan for team discharge planning within 7 days of admission. (n=214)	35.4	41.4	38.9	36.9	41.6	31.2	37.7	38.1
19. Inclusion of family in discharge planning.	72.0	66.3	**81.1**	**57.8**	73.3	63.6	**80.8**	**43.5**

	Sex		**Living Status**		**Preadmission function**		**In-hospital function**	
Integrated Care Indicators	**Women**	**Men**	**Living with other(s)**	**Living alone**	**Low**	**High**	**Low**	**High**
(n=208)								
20. For those going home, provided with written discharge information form. (n=152)	82.2	80.6	78.4	85.9	81.4	81.8	82.8	79.7
21. For those going home, discharge form includes instructions that are free of jargon. N=(152)	50.0	40.3	48.9	42.2	47.7	43.9	51.6	37.3

Bold= significant at .05 or less.

For the ward level analysis, there were six indicators that exhibited large variability across wards (range >50%; see supplementary table). For example, for Indicator 7, which asked about the use of the discharge planning screening tool, one ward achieved this indicator 0% of the time, while in three other wards, it was achieved 100% of the time (range=0=100%). All three of the indicators collected from standardized forms had large variation.

Table 9.4 provides a summary of all 28 originally developed indicators and how we were able to operationalize them with this dataset. The indicators as originally developed are listed in the first column. In brackets beside each indicator is an annotation to indicate which (one or more) of the four domains from the guiding conceptual framework is represented in each indicator. The second column indicates whether or not the indicator could be collected reliably. The third column indicates if the indicator continued to represent the same domains from the guiding conceptual framework as it did before any adaptation occurred. The fourth column indicates if the indicator continued to measure the concept of integrated care, or if the indicator had become more consistent with the concept of coordination. The concept of a continuum from fragmentation to full integration, with an intermediary step of coordination was first introduced by Leutz (1999), and has been more fully described with examples by Thistlewaite (2011). In sum, we were able to collect data on seventeen indicators that had acceptable reliability. The seventeen indicators taken together continued to represent all four of the domains in the guiding conceptual framework. With adaptation, six of the indicators lost some of the philosophical grounding of the concept of integrated care.

Table 9.4 Overall feasibility of indicators

Original Indicators (domains the indicator represents from conceptual framework)	**Able to collect from data with acceptable IRR?**	**Domains the indicator continues to represent**	**Whether or not consistent with concept of integrated care (versus coordination or linkage) @**
The client receives care from a team that provides service across settings (I,C)	Yes	I	No: no longer represents boundary-crossing care.
The client has a primary care provider that is recorded upon admission to hospital (C).	**Yes**	**C**	**Yes**
The client has a care coordinator that can coordinate care across settings (I,C).	Yes	I	No: no longer represents boundary-crossing care.
The client has a case manager that provides case management in any care setting (I,C).	No	I	No: no longer represents boundary-crossing care.
The client/family is receiving social service support in the community (including caregiver support, practical support like meals on wheels, social programming) (I, P).	Yes	I,P	No: indicator one step removed from social service delivery; looks at caregiver distress as a proxy.
Client receives care from a hospital multidisciplinary team that has both a social and medical perspective (based on type of team members) (I,W).	**Yes**	**I,W**	**Yes**
Client's risk assessed to determine level of care transition support need (I,W).	**Yes**	**I,W**	**Yes**
Adequate preadmission information transferred from community to hospital staff about client to develop individualized discharge plan (I,C).	No	N/A	N/A
Timely information transmission of client's preadmission information for disposition planning (I,C).	No	N/A	N/A
During hospitalization, communication occurs between the hospital and community agencies and services in order to coordinate the client's discharge plan (C).	**Yes**	**C**	**Yes**
The client has provider continuity during the hospital stay, by means of an assigned care coordinator (W).	Yes	W	No: changed to physician continuity.
Timely transfer of client's hospital discharge information to community providers (C).	**Yes**	**C**	**Yes**
A shared multidisciplinary report is transferred to community providers (I,C).	No	N/A	N/A
Client's post-hospital appointments scheduled prior to hospital discharge date (C).	**Yes**	**C**	**Yes**
Client provided with timely post-hospitalization	No	I,C	Yes

Original Indicators (domains the indicator represents from conceptual framework)	**Able to collect from data with acceptable IRR?**	**Domains the indicator continues to represent**	**Whether or not consistent with concept of integrated care (versus coordination or linkage) @**
support to ensure needs being met, determine if new needs (I,C).			
Cross-boundary client- specific education or training between health providers provided (I,C).	**Yes**	**I,C**	**Yes**
Client's chronic disease care is based on a multidisciplinary care pathway or guideline (W,P).	No	N/A	N/A
Client's disposition planning was based on a multidisciplinary care pathway or guideline (W,P).	No	N/A	N/A
Needed multidisciplinary team members for client's discharge planning are identified, and provide the needed service (W).	Yes	W	Yes
The client's biopsychosocial care needs for discharge planning is discussed at regular multidisciplinary meetings (I,W).	Yes	W	No: measured presence or not of meetings, rather than looking at content of meetings.
The client received multi-domain assessment of discharge needs and a plan to meet these needs (I,W,C).	Yes	W,C	No: measured whether or not a plan was documented, regardless of whether or not there was a multi-domain assessment and/or plan.
The client is involved in the discharge planning process (P).	No	N/A	N/A
The client's family is involved in the discharge planning process (P).	**Yes**	**P**	**Yes**
Client and family provided with education about reason for medical stay and self care on discharge (I,P).	Yes	P	No: unable to determine exact content of teaching. Measured receipt of discharge form regardless of content on form.
Discharge instructions are individualized to the client's knowledge needs (P).	Yes	P	Yes
Client is satisfied with the disposition plan (P).	No	N/A	N/A
Client and family are provided with self-management education or referred to a self-management program for post-discharge care (I,C,P).	No	N/A	N/A
Client's care needs are met regardless of program eligibility requirements (I).	No	N/A	N/A

*not able to determine due to low number of sample meeting this indicator
@determined using examples from Thistlewaite, 2011 for guidance
I=interdisciplinary individualized care domain
W=within hospital coordination and continuity domain
C=hospital and community coordination and continuity domain
P=patient and family involvement

9.6 Discussion

The purpose of this study was to determine the feasibility of developing integrated care indicators to measure the provision of integrated care to promote smooth transitions between the hospital and home for older adults. We aimed to fill a critical gap in the literature by developing a measurement tool that would determine the extent of integrated care, rather than focus on the outcomes of integrated care (Janse et al., 2016).

We had no difficulty developing indicators due to the sound conceptual literature base on integrated care and the features of integrated care. Overall, of the 28 indicators, we were able to measure 17 of them reliably, and the 17 taken together, represented all four domains of the guiding framework. Despite adapting the indicators to the available data, we were able to keep eleven of them consistent with the concept of integrated care. The other six indicators provide helpful data, but need to be interpreted with the consideration that they are more conceptually consistent with the concept of coordination (see Table 7.4), an intermediary step on the continuum between full integration and fragmentation (Leutz, 1999).

In considering the foundational elements of integrated care in the guiding framework, the most difficult aspect to capture directly in the indicators was whether or not the care was individualized. It was not possible to make an evaluation of the client's needs from the chart in order to determine if the care to the patient was adequately individualized (i.e. all their specific needs met). The concept of patient-centredness is also a difficult construct to measure, as an objective measure cannot get at the subjective experience. However, with this limitation aside, the indicators provide information on how the patient is being considered in care provision. The foundational concepts of horizontal integration, vertical integration, biopsychosocial and multidisciplinary care were all well represented in the indicators.

The indicators demonstrated variability across a sample of older adults all requiring continuing care upon hospital discharge. Some of the results imply that care is being tailored to those with more need, as reflected in the results that those with lower in-hospital function had more indicators of integrated care that were met. Other results imply that those with social support are provided with more integrated care, since those that live with others also had more integrated care indicators met.

The ward level analysis provided information on how integrated care practices varied within one institution. In particular, there was variation in the use of standardized forms that promote integrated care principles. For example, one ward never used the discharge planning risk screening tool, three implemented it 100% of the time, and four had variation in its use between patients. All three of the indicators that collected information from standardized forms had wide between-ward variation. There are many potential reasons for the variation between wards. A few possible explanations could be that some wards have more high acuity patients than others, that there are different managerial styles between wards, or that there are differences in how the multidisciplinary teams work together on each ward.

The 28 indicators developed in this study can be used by others for exploratory program evaluation, and once further validated, for research purposes. Since chart data varies from setting to setting, other settings may be able to use more of the indicators than we were able to in this setting, and with less adaptation. As such, we provided both the originally developed indicators, as well as how we applied them to support others who would like to apply the indicators in their own settings. If any of the indicators are adapted for a particular setting, we recommend ensuring that all four of the domains from the guiding conceptual framework are included across the indicators being used. If an indicator needs to be adapted, tracking if the indicator is measuring integration or coordination is useful (Thistlewaite, 2011 is a helpful resource in this regard).

To be able to further interpret these results on individual and ward level integrated care variation, important future work is to validate these 28 indicators. For determining predictive validity, this could be done by looking at associations between health system outcomes and the indicators, controlling for patient factors. This could include short-term outcomes, such as hospital readmissions, or since integrated care is a strategy for long-term patient and health system success, they could be associated with a long-term variable such as length of time supported in community, or overall health system cost.

A challenge in collecting data meaningful to the concept of integrated care reliably was that some of this data was recorded in a narrative fashion. While the data from standardized forms was the most feasible to extract with high reliability, there was data embedded in narrative chart notes that were more relevant for several of the indicators. Developing sound methods for this type of data extraction is an area for future work, as chart review method literature focuses primarily on collection of discrete quantitative variables. Until this literature is further developed, it is important to ensure reliability by using highly trained data abstractors with health professional backgrounds, clearly defining indicator criteria, periodically re-measuring the IRR during data collection, and providing feedback to the abstractors to improve the IRR (Gearing et al., 2006; Yawn & Wollan, 2005).

Our results provide a perspective on individual-level integrated care delivery and variation that is currently missing in this body of literature (Janse et al. 2016). The results of this study demonstrate the type of information that can be gleaned from indicators to address the quality of health care transitions. For example, for this study setting, discharge instruction is an area for review. While 81.6% of the sample received a discharge instructions form, only 46.1% of forms had information written in a patient-friendly manner.

This study has several limitations. Although this study focused on care transitions between the hospital and the home, and advocates for considering the community and hospital processes simultaneously, we only used hospital chart data. It was not feasible for this study to include primary care data, as multiple primary care sites served the patients in this study. The indicator data may have been more robust if we had included data from primary care practitioners, and future validation work should address this possibility. However, for our study, the majority of the charts contained community-based home care reports on the patients' preadmission medical, health services, social and functional status that we were able to use to represent the community perspective. Finally, this study did not incorporate consultation to verify the content validity of the indicators, but rather, indicators were developed based on literature that was based on front-line provider and middle manager opinion. Future work should incorporate the opinions of patients, and administrators, to strengthen the content validity of these indicators. Despite these limitations, this study provides information that will be helpful to researchers and policy-makers who wish to measure individual level integrated care practices in their health care settings.

In conclusion, the development of integrated care indicators from chart data requires special considerations, but can provide information on care quality in relation to care integration and coordination.

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Supplementary Table: Proportions of indicators met according to ward of admission and ward of discharge

	Ward of admission						**Ward of discharge**							**Range**[&]
Indicator #*	**W1 (*n*=51)**	**W2 (*n*=50)**	**W3 (*n*=38)**	**W4 (*n*=27)**	**W5 (*n*=19)**	**W6 (*n*=12)**	**W7 (*n*=44)**	**W2 (*n*=40)**	**W1 (*n*=35)**	**W3 (*n*=28)**	**W4 (*n*=23)**	**W8 (*n*=14)**	**W5 (*n*=12)**	
1. (*n*=214)	15.7	20.0	28.9	18.5	22.2	33.3	29.5	17.5	11.4	25.0**	21.7	14.3	21.4	21.9
2. (*n*=214)	76.5	68.0	76.3	81.5	63.2	25.0	65.9	65.0	77.1	71.4	82.6	70.0	75.0	57.6
3. (*n*=199)	57.8	54.3	52.8	57.7	63.2	75.0	69.8	50.0	53.3	57.7	54.5	53.8	58.3	25.0
4. (*n*=214)	84.3	86.0	76.3	85.2	89.5	83.3	87.0	92.5	88.6	85.7	87.0	78.6	91.7	16.2
5. (*n*=208)	49.0	45.8	42.1	60.0	68.4	41.7	56.8	48.7	47.1	32.1	61.9	66.7	58.3	36.3
6. (*n*=214)	78.4	78.0	68.4	92.6	89.5	91.7	95.5	77.5	68.6	53.6	91.3	92.9	83.3	41.9
7. (*n*=214)	98.0	100.0	78.9	0.0	100.0	66.7	84.1	100.0	97.1	85.7	0.0	100.0	91.7	100.0
8. (*n*=214)	17.6	28.0	28.9	33.3	31.6	33.3	38.6	27.5	11.4	10.7	34.8	50.0	25.0	39.3
9. (*n*=213)	68.6	84.0	84.2	81.5	52.6	83.3	54.5	92.5	85.7	82.1	95.7	50.0	66.7	45.7
10. (*n*=205)	59.6	32.0	69.7	15.4	52.6	9.1	50.0	30.8	44.1	73.9	13.6	57.1	33.3	60.6
11. (*n*=197)	42.0	54.2	63.9	57.7	46.7	63.6	60.5	55.3	64.5	56.0	56.5	50.0	30.0	34.5
12. (*n*=147)	58.3	64.9	81.8	75.0	100.0	75.0	90.5	60.6	54.8	77.8	75.0	83.3	90.9	45.2
13. (*n*=143)	24.2	38.5	34.5	8.3	28.6	50.0	55.0	30.3	24.1	37.0	8.3	50.0	18.2	46.7

14. (*n*=143)	60.6	72.5	80.6	81.8	100.0	100.0	82.6	67.6	58.6	88.0	81.8	83.3	100.0	41.4
15. (*n*=214)	72.5	86.0	78.9	85.2	73.7	75.0	77.3	85.0	74.3	75.0	87.0	85.7	83.3	14.5
16. (*n*=152)	13.5	22.5	15.2	25.0	7.1	0.0	30.4	17.6	9.4	14.8	25.0	16.7	0.0	30.4
17. (*n*=214)	49.0	50.0	31.6	0.0	36.8	33.3	25.0	57.5	57.1	35.7	0.0	35.7	58.3	58.3
18. (*n*=214)	51.0	38.0	15.8	29.6	47.4	33.3	40.9	40.0	54.3	10.7	26.1	50.0	41.7	43.6
19. (*n*=208)	62.7	62.5	81.1	76.0	63.2	63.6	88.1	64.1	51.4	71.4	71.4	76.9	41.7	46.4
20. (*n*=152)	94.6	100.0	63.6	25.0	85.7	75.0	100.0	97.1	93.8	59.3	25.0	66.7	100.0	75.0
21. (*n*=152)	48.6	50.0	42.4	16.7	57.1	50.0	82.6	41.2	43.8	40.7	16.7	16.7	63.6	65.9

Proportions calculated only for ward for which there was a minimum of 10 patients admitted or discharged.

*See Table 3 for full indicator descriptions.

& maximum minus minimum percentage for indicator

Chapter 10: Conclusion

10.1 Summary and Key Contributions

The overall aim of this thesis was to identify and begin to address some of the gaps in the use of integrated care for supporting care transitions of older adults transitioning between the hospital and the community. The topic areas of care transitions and integrated care have both been studied extensively, but the intersection of these topics required more study. Therefore the first objective was to critically examine the existing literature on care transitions among older adults requiring continuing care from an integrated care perspective. I conducted a scoping review to address this objective which identifed several gaps in the literature. Thus the second and third objectives of this thesis addressed two of these gaps. Since there is no agreement on who should be targeted for high intensity integrated care interventions to reduce or support care transitions, the second objective characterized the older adult population that could benefit the most from integrated care approaches from a systems perspective, by looking at the association between personal characteristics of hospitalized older adults and poor health service outcomes. Finally, since there are no measures of clinical integration for care transitions, the third objective was to develop and test the feasibility of a measurement tool to assess the presence and extent of integrated care in day-to-day care delivery to support care transitions.

This thesis moved from considering the breadth of integrated care frameworks for the first two objectives, to looking specifically at clinical integrated care process measurement for the third objective. The findings in relation to these three objectives considered together provide an important knowledge base to approaching care transitions with an integrated care perspective in future research. They provide some needed clarity on the intersection of integrated care and care transitions within two vast, complex and inconsistent fields of literature. The findings also provide information both on older adults that might best be served with integrated care, and indicator measurement that can be used by researchers and policymakers seeking to improve the coordination, continuity and quality of care transitions for older adults with complex care needs.

In this concluding chapter, I provide a summary of findings and address implications for each of the research objectives addressed in this thesis. As well, I discuss lessons learned from the chart review process, since this method is not well developed in the literature. Then, I provide an overview of the strengths and limitations of the overall thesis, extending beyond the limitations addressed in each chapter. Finally, I discuss future directions for this topic of study based on the findings from this thesis.

10.2 Research Findings

10.2.1 The landscape of integrated care for care transitions of older adults.

The major goals of integrated care are to improve health care system efficiency by reducing institutional health care use, and improving patient quality of care (Chappell & Hollander, 2011). Integrated care also has potential to improve the care transitions of older adults with chronic disease who require periodic admission to acute care facilities to manage disease exacerbations, as integrated care models also emphasize the need for seamless care across care environments. However, the care transitions literature is mostly focused on the care provision from the perspective of the hospital, rather than from a broader health system perspective.

A scoping review on integrated care and care transitions addressed my first research objective to understand how integrated care is conceptualized in the context of care transitions, and the strengths and gaps in current research and practice. Integrated care specific to care transition improvement was found to be an emerging area of study, with grey literature indicating that there is more occurring on this topic in practice than is being represented by peer-reviewed literature. As is consistent with the field of integrated care as a whole, the body of literature on this topic was heterogeneous on many fronts, including the population studied, outcome measures used, and how integrated care was conceptualized. However, the majority of the literature viewed integrated care as an approach that looks at both the social and health needs of the individual or population, and then builds care to address both of these domains.

The findings of the scoping review reinforce the importance of standardizing the concept of integrated care in the literature; otherwise it is impossible to synthesize or consider the generalizability of studies into other contexts (Kodner, 2009). For example, the use of the term integrated care was used narrowly to describe the use of an interprofessional guideline in one document (British Columbia Provincial Seniors Hospital Care Working Group, 2012a), but a broad initiative of aligning education, health, social and housing services in another setting (National Health Services [NHS] Forth Valley, 2012).

The scoping review also identified major gaps regarding measurement. One gap was that structured measurement of integrated care is largely absent in the grey literature. Evaluation is needed on these emerging initiatives. Without it, as programs and services are layered onto, within, or between existing programs and services, we will not be able to tease out the effects of the integration efforts. Further, there was very little process evaluation in all of the documents. Process evaluation is needed to determine the impact of initiatives on outcomes.

Finally, in regards to measurement gaps in the literature on care transitions and integrated care, there was much more focus on health care use than on patient outcomes, even though patient-centred care is one of the major philosophical goals of integrated care. It is important to make sure that both the desired outcomes of integrated care (health care system efficiency and improving care quality) are given weight, as without also ensuring patient satisfaction and beneficial health outcomes, the gains in reducing of institutional use by implementing integrated care will only be temporary. I was not able to address this issue further in this thesis; it is an important area for future research.

One important caution when considering the findings of this scoping review is that it focused specifically on initiatives that were explicitly labeled as integrated care initiatives. Since integrated care is such a broad concept, there is literature on care transitions interventions that use components of integrated care but do not use this term. This literature would not have been captured in this scoping review, and therefore this review represents how integrated care is being conceptualized for care transitions, rather than being exhaustive in illustrating how integrated care is being implemented for improving care transitions.

The findings of this scoping review led to the second and third objectives, which aimed to look more specifically at determining the specific population that should be targeted by integrated care initiatives, and exploring how integrated care could be measured using clinical process indicators.

10.2.2 Who should be targeted for integrated care initiatives?

Objective 2 aimed to examine in detail the older adult patient population who might most benefit from integrated care. There seems to be consensus in the literature that resource intensive integrated care is best applied to specific populations (Beland et al., 2006; Evans et al., 2013; Leutz, 1999). However, there is little specific information in the literature on who exactly should be targeted. The main integrated care framework used for this dissertation views integrated care as an approach that can benefit populations with ongoing care needs and their families, such as older adults, and people living with disabilities (Hollander & Prince, 2007) Further, integrated care aims to reduce institutional care needs, and thus it makes sense to target individuals with continuing care and institutional care needs for targeted integrated care programs. While literature related to care transitions has looked at the predictors of heath service use, it has focused only on the status of the patient as they enter the acute care hospital in order to develop hospital screening tools to determine who needs supports for discharge planning. A lens of integrated care promotes taking a broader view of the care transition, and considering both the preadmission as well as the in-hospital patient status in determining need. Thus, we examined the preadmission *and* in-hospital health, social and functional characteristics of older adults with continuing care needs, and who had higher institutional care use, to determine who to target for integrated care. Overall, the findings highlighted the complexity of older general medical patients with continuing care needs, helping to understand how integrated care approaches could match their needs.

The findings from this study corroborated other studies that have indicated that people with mental and physical co-morbidities have particularly high care needs that can be difficult to meet in the community without an extensive support system (Domino et al., 2016). People with cognitive issues clearly will have more challenges managing their physical chronic conditions, and people with behavioral issues can be challenging to care for in the community, particularly when they lack an informal support system. Many of the features of integrated care frameworks address these complex needs, for example, by providing flexible funding for times of high need, 24 hour service, and case managers that can get to know the care needs and preferences of individuals. The corroboration of these findings of the complex needs of people with both physical and mental health needs through the lens of integrated care has important implications for policy makers. It tells us that the integrated care approach of using a biopsychosocial model to provide and coordinate needed services is preferable to care being limited by siloed programs for this vulnerable population. Further, since a potential barrier to implementing integrated care is the perceived cost of intensive services, this information helps with targeting the population most in need to allow for the best use of resources to ensure a cost neutral program.

Since the publication of the manuscript in Chapter 8, I found another Canadian study that had similar findings when examining the characteristics of people with long ALC stays (Turcotte & Hirdes, 2015). Similar to my findings, the long ALC patient tends to be unmarried, have ADL dependency, and impairment in cognition and orientation. These studies corroborate each other's findings in identifying those patients who are most vulnerable to potentially undesirable health care use outcomes.

An interesting finding of my study was that those at high risk who may benefit from integrated care seem to be easily identifiable by the home care case coordinators and/or families themselves. There have been a lot of research resources invested in identifying at-risk patients to provide them with services (Kansagara et al., 2011), but it may be that clinical judgment is a fair substitution for these screening tools. Individuals for whom case coordinators were flagging safety concerns in home care notes were those who tended to have high rates of institutional care, indicating that home care coordinators could be responsible for streaming individuals from the standard home care program into an integrated care program when their needs are difficult to meet with the standard home care program. The "Priority Home" program recently implemented by the Winnipeg Regional Health Authority is based on some integrated care principles (temporary flexible funding for care, identification of need by hospital or home care coordinator, multidisciplinary approach to care), and entry into the program is based on clinical assessment of need for long-term care. Thus it will be an interesting program to study in terms of its ability to reduce institutional care use, particularly since it is a short-term program.

A caution is that I only studied individuals who received continuing care on discharge. Therefore, I may have missed older adults who had continuing care needs upon discharge from hospital, but were not provided with any continuing care. Another limitation of this study that was brought to my attention by a recent publication is that I did not investigate interaction effects (Middletone, Li, Kuo, Ottenbacher & Goodwin, 2018). Middletone and colleagues investigated predictors of nursing home admission and found that there were interaction effects for age, ethnicity and cognitive function. For example, being unmarried was more of a risk factor for those aged 66 to 70 than those older than 70.

10.2.3 Addressing measurement gaps: Measuring integrated care delivery at an individual clinical level

Finally, I aimed to address a major gap in the literature in terms of measurement of integrated care at a clinical individual level. Integrated care is a broad concept that can be applied from a macro to micro level. Because of the roots of integrated care at macro levels, this has been a major area of focus for measuring the extent to which integrated care goals have been achieved. For example, Lyngsø et al. (2014) found 23 tools measuring structural, process and/or cultural aspects of integrated care from the perspective of health care providers. While recently there has been more focus on measuring integrated care delivery in the clinical environment, these measures almost exclusively collect the subjective perspectives of health care providers. This left an unanswered question: is there variation in how integrated care is delivered to individuals within the same clinical environment?

The strong conceptual literature base on integrated care promoted the development of a framework and 28 related indicators to address this question. This is a unique contribution to the literature, as it provides indicators with content validity that can be further developed for program evaluation by health care institutions or by researchers. In particular, it can complement other measures that are aimed at the macro level and patient experience. Used together, these measures can help understand the impact of integrated care initiatives in a comprehensive way, or to develop a baseline understanding of current integrated care practices in relation to care transitions within a particular health environment (hospital, community region).

The challenges I encountered in developing these indicators provide helpful lessons learned as this work is extended in the future. One main challenge was in implementing these indicators in an environment with little vertical integration. A potential approach in the future is to develop measures that grade the extent of integration for each indicator. As indicated in the introduction, integrated care is on the opposite end of fragmentation on a continuum. Steps on the continuum include coordination and linkages. In some settings, the goal may be to enhance coordination, rather than to fully integrate. A potential way to capture information on where a program or service falls along this continuum would be to develop a scale rather than dichotomous response for the indicators. For example, for the indicator about case coordination (Table 7.1, #3), the indicator response options could be: has a boundary-crossing case coordinator (representative of receiving integrated care); has a case coordinator in the community and the hospital that communicate (receiving coordinated care); does not have a case coordinator (receiving autonomous care). This approach would have the benefit of allowing sites to compare their performance to their own perceived optimal targets as proposed by Ahgren & Axelsson (2005).

The second main lesson learned was in regards to considering the impact of micro-system effects when interpreting the results (Nelson et al., 2002). The integrated care literature points to the importance of integrated care being implemented both in a bottom-up as well as a top-down fashion, since top-down approaches may not always result in the buy-in of front-line staff, thus obstructing the integrated care initiative (Kodner &Kyriacou, 2000; Oewens et al., 2005). The use of standardized forms that promote documentation of integrated care by some wards and not others could be reflective of a lack of a match between administrative and front-line intentions regarding integrated care.

The integrated care indicators based on narrative data were time consuming to collect and more difficult to analyze reliably. However, these narrative data were important to fully explore the construct of integrated care. For example, family and patient involvement is an essential component for measuring the full construct of integrated care. However, family and patient involvement is not routinely measured in daily clinical care in a quantitative fashion. Therefore, data such as narrative notes describing interactions with family members are needed to evaluate the implementation of patient and family involvement. In sum, despite some of the challenges in examining these clinical indicators with this particular dataset, it was demonstrated that the indicators could provide information on integrated care delivery that has previously been absent in the literature.

The framework and 28 indicators are a significant contribution to the integrated care and care transitions literature. The 28 indicators are ready for exploratory program evaluation in their current state, and with validation, can be used for research purposes. Each setting would need to determine the operationalization of the indicators, and could draw from the originally developed indicators, and/or my operationalized indicators. When approaching a dataset with these indicators, researchers should ensure a careful pilot phase in which they determine which data points would be the most meaningful or helpful to answering their specific questions about integrated care to balance quality and quantity in data collection, particularly if drawing on narrative data. The evaluator/researcher should also ensure that there is at least one indicator addressing each of the integrated care domains from the guiding conceptual framework of integrated care for care transitions, as a single indicator cannot represent the broad concept of integrated care. Finally, researchers may want to collect data related to microsystems to help with interpreting the data, and subsequently, making recommendations for practice changes.

10.2.4. Lessons learned from chart review process.

A large component of this thesis work was the development of a process for chart review and data extraction. While I found two helpful articles to guide the development of my methods (Allison et al., 2000 ; Gearing et al., 2006), there is generally very little literature discussing chart review methods. Therefore, it is worth discussing the lessons learned from the process of developing and implementing my chart review method.

The first lesson was the importance of having a strong conceptual framework when approaching the chart for constructs that are broadly defined in the literature, as is the case with integrated care. Chart review literature is quite specific to studies with variables that have very clear definitions, and thus the main concern is ensuring that data abstractors are adhering to the variable definitions (e.g. whether or not there was a diagnosis of depression made, whether or not a mammogram was performed). My first approach to the charts without strong definitions of integrated care resulted in having a lack of direction, due to the sheer volume of data that is available for potential abstraction. Therefore, reviewing the chart as a whole to understand better the data available with an understanding of integrated care frameworks, and then returning the integrated care literature again to develop firmer parameters and definitions for the integrated care indicators was a very important step in developing the data extraction guide.

Another important difference between the chart review process I undertook and the literature on chart review methodology, was that for some of the indicators, there was no quantitative data available, nor any consistent area in the chart where the needed data was available. For example, there was no consistent spot for information to be written about the involvement of patients and families in the discharge planning process. As such, we extracted this data in a narrative fashion from multiple areas in the chart for further analysis by the primary investigator following extraction. This qualitative data had more challenges with inter-rater reliability. Developing reliable and valid processes for using qualitative data for conversion into quantitative indicators is an area for future work that would assist researchers using chart data to answer questions about the application of theoretical constructs in daily clinical practice.

Overall, the greatest advantages of this method were the ability to study an entire cohort without losing any of the sample to attrition, and in gaining a perspective of daily care delivery. A disadvantage to this method was that it does not allow for collection and sharing of more granular information that would help to understand the complexity of the care needs of this population, the extent to which their care needs are met, and the barriers and facilitators to meeting their care needs. One way to share this type of information using the chart review data is to use a case study approach, where composite cases are developed to describe common care paths and scenarios for the older adults in this study. Another option would be to use a qualitative approach. There is qualitative research that has explored the stories of older adults post hospital discharge, but there has not been research that explores the process of care during hospitalization and care transition to home from the perspective of the older adult. Collecting data during the older adult and their family's experience during the care experience rather than depending on recollection of the experience may provide more detailed information on day to day care practices that can be used to improve daily care practices. This qualitative data could be used in combination with the quantitative quality indicator data in a mixed method approach to enhance depth of understanding on daily care practices of delivering integrated care for older adults transitioning between hospital and home.

10.3 Strengths and Limitations

This work has several strengths. One is that it helps to organize, and make sense of, the information on integrated care practices in relation to care transitions, an understudied area considering that a main goal of integrated care is boundary-free care. The integrated care literature is known for its complexity and lack of cohesion, and thus this study makes a step forward in developing cohesion and focus for the topic of care transitions.

The use of integrated care frameworks was helpful for approaching the topic of care transitions in multiple ways. This was a new approach to care transitions research, as the literature to date has been primarily on hospital-focused interventions (Gonçąlves-Bradley et al., 2016). While the main data source for this work was from the hospital, the application of an integrated care lens allowed for viewing care transitions as a partnership between the community and the hospital, rather than seeing solutions to care transitions only from a hospital services perspective. For the scoping review, this perspective helped to expand the traditional focus on interventions involving the hospital and the hospital team, to considering interventions that can be implemented by the community, and in multiple domains (funding, administrative, organizational, service delivery, and clinical).

By taking this broad perspective, the scoping review can inform new directions for future research.

For the second objective of characterizing older adults who would most benefit from integrated care, the integrated care lens promoted consideration of the care trajectory across the entire care transition, thereby considering the patient’s status in the community prior to the hospital admission as well as at discharge from the hospital. This prompted examination of health provider documented data regarding preadmission health, social status, and function as well as in-hospital status. This approach is not commonly implemented in research on predictors of post-discharge health services utilization; I was only able to find two other studies taking this approach, one of which was published following my own publication on this topic (Coleman et al., 2004; Fathi et al., 2017). Further, with this expanded view of the care transition occurring across levels of care, my attention was drawn to data documenting preadmission concerns, which led to unique findings on pre-hospitalization challenges in the community.

Finally, the integrated care lens, specifically the concept of clinical integrated care, provided breadth for the development of process indicators for care transitions. The use of the framework allowed me to simultaneously address many of the issues that are documented in the care transitions literature, such as the need for patient-centred care, the need for timely communication, and the need for coordination between hospital and community services. This is a departure from discharge planning literature that has discharge checklists that focus on the mechanics of discharge planning and discharge education (Jack et al., 2009).

Another strength of this study was that the data collected was within a very recent timeframe, increasing its generalizability to today's context. This is important as health care systems are constantly changing and adapting. The data collection approach followed best practices as is currently outlined in the literature, and the application of a broad theory to chart review indicators provides future researchers with some considerations for this type of indicator development. The chart review method also was important in learning about people with continuing care needs as it allowed for study of the entire cohort, without needing to eliminate those who would have been too sick to participate in a study involving direct data collection, or who may have had temporary or permanent cognitive impairment that would have impeded their participation.

Limitations to this study included the inability to verify the validity of the chart data in terms of daily charting practices in the study site. There is no way to verify if the care providers chart consistently between each other and between patients. This was addressed as best as possible by careful management of negative data (e.g. including both negative and non-response options in the abstraction form), and an analysis of missing values to check for systematic patterns.

Another limitation is the focus on only one setting for addressing objectives 2 and 3, limiting the generalizability of the findings. Looking at another setting would be a natural next step from this study to identify parallels with populations and indicator findings in different settings, or to determine if these findings are somewhat unique to the study setting. However, the demographic and social profile of the sample in this study had similarities to other studies, suggesting that this study sample was not completely unique from study samples in other hospitals across Canada (Turcotte & Hurdes, 2015)

Integrated care frameworks are complex, incorporating several concepts, levels of care, and viewer perspectives. This complexity makes it an attractive framework for addressing issues of care transitions, as care transition improvement seems to require a multi-modal and multi-level approach (Gonçalves-Bradley et al., 2016; Kansagara et al., 2011; Laugaland et al., 2012). However, this complexity lends itself to challenges in research and evaluation. As such, while this thesis has generated knowledge on the application of integrated care in relation to care transitions, there is much more work to be done to ensure that the application of this approach is studied to its full breadth and intent. There were two areas that were not explored in depth in this thesis in the second and third studies. The first is the impact of the macro level structure on the findings. The second is in using and exploring the concept of patient-centredness.

A tension in integrated care models that was discussed in the introduction of this thesis, is how integrated care aims to simultaneously improve system efficiency as well as improve patient-centredness. This approach requires simultaneous consideration of the macro level and the patient-centred delivery of health care. In terms of the macro perspective, this thesis did not explore how the macro system may have impacted the results of the studies. For example, in Study 2, I was not able to tease out how the current type and intensity of services was impacting the outcomes of readmissions, long hospital stay and discharge to institution as compared to the personal characteristics of the sample. The “concerns” variable provided some indication that there may be gaps in the system that made it difficult to provide high quality patient-centred care for clients with complex care needs, but I did not explore this hypothesis in this thesis.

Integrated care for care transitions

This thesis identified that while integrated care frameworks have in common the belief in patient-centred care, the study of patient perceptions of integrated care is lacking. Beyond identifying this gap, this thesis did not address this issue further. This thesis primarily took a system-level perspective due to the choice of methods. The development of a guiding framework and indicators was based on literature emphasizing the opinion of ‘experts’, defined as people delivering health care services and researchers. The use of a chart review also provides a system perspective since health professionals construct the patient charts. As such, there is still much work to be done in the area of care transitions and integrated care to address the patient perspective. I will discuss this in more detail in the future directions section that follows.

Future work should also consider the use of both primary care and hospital data. While the integrated care lens used in this study advocates for considering the community and hospital processes simultaneously, the setting in this study did not have an integrated electronic medical record system. Thus for feasibility, only data available from the hospital were used. There may have been information from the primary care setting that would have provided a more complete picture of integrated care for care transitions; for example, whether or not the primary care provider was aware of the hospitalization, and mechanisms put in place by the primary care practitioner for post-hospitalization support. However, this study still extends previous studies of care transitions by incorporating preadmission community data that we accessed via community-based home care reports.

Because the indicator development process was exploratory in nature, it followed a very iterative process, transitioning frequently between model development and data collection. Thus, the final indicators were influenced heavily by the charting procedures and content of the charts from the study setting. If it had been possible to establish a firmer framework and indicators before approaching the charts, the indicators may have been operationalized differently. Therefore, validating this study with different settings and determining the discriminative validity of the 28 indicators is important future work.

10.4 Future Directions

Several future directions have been implied in this chapter so far. This section will explicitly discuss several important future directions. It will start with addressing future directions that immediately stem from this work, and then discuss broader potential future directions for a program of study on care transitions for older adults using an integrated care lens.

While the scoping review in this thesis provided clarity on the current state of how integrated care is conceptualized in relation to care transitions, there is still work to be done in developing a common language or taxonomy for integrated care initiatives to promote clear communication on the topic. Using the data on the various initiatives collected by this scoping review, specific language could be proposed to name the types of integrated care being applied in practice across one or more domains, to address the need for common language.

This thesis also points to the importance of knowledge translation and implementation of services for meeting the needs of people with physical and mental health impairments. Evidence is available to indicate the high needs of this population from this work (and work of others), but more needs to be done to explore how to support clinicians in caring for this population, and how to support policy change to reduce silos between physical and mental health care systems. Since initiatives that encourage team-based care are currently being implemented within the WRHA, the needs of practitioners working with these populations could be explored in more depth to support movement up the continuum of integrated care. A highly detailed review of the current services provided to this population, and provider and patient identified gaps would contribute to assuring that expanding primary care teams are best organized and resourced to meet the needs of older adults with continuing care needs.

The indicators developed for addressing objective three found variation in integrated care practices at both the ward and individual levels within a fairly homogenous sample in one macro system. Validation is an important next step to understand if these findings can be interpreted at face value; that is, does the variation reflect variation in integrated care that is ultimately related to patient outcomes? Without validation it is not clear if the variation is simply random, if it reflects practice variations in response to patient need or system need, or if it represents fragmented or inconsistent care delivery.

In terms of validation, asking patients about the personal relevance of the indicators could strengthen content validity. Further, both internal and external validity need further work. Discriminative validity could be determined by correlating the indicators with patient reports of high and low satisfaction with integrated care, or by comparing patient reports in highly integrated and minimally integrated health systems. Predictive validity should also be examined, for example by correlating the indicators with an adverse outcome, like hospital readmission while controlling for patient factors.

If these indicators are found to be valid, they could then be used to track change within a system over time as it aims to become more integrated. To support tracking change over time, the indicators could be developed as a scale response using the continuum of integration as suggested by Thistlewaite (2011). Each indicator would therefore be ranked as representing stages such as: fragmented, linked, coordinated, or integrated, rather than recording only the presence or absence of integration.

Another helpful extension of this work would be to develop a toolkit of measures for integrated care and care transitions. As it is important to ensure that integrated care is occurring at macro, meso and micro levels (Kodner &Kyriacou, 2000; Oewens et al., 2005), as well as from the patient perspective (Hollander & Prince, 2007; WHO, 2015), the tool kit could contain the validated indicators for the micro level, indicators for the meso level, a measure for the macro level, and a patient perspective measure. For example, there is already a patient tool developed that would fit this need (Cramm & Nieboer, 2014), and multiple macro tools as discussed in Chapter 1. Using the toolkit, a long-range research objective could be to investigate how the different domains of integration interact to produce outcomes controlling for pre-admission patient characteristics. This would provide much needed knowledge on the influence of the different domains of integrated care on outcomes, and help determine where to focus integration efforts within the health care system.

There are several opportunities for future directions related to incorporating the concept of patient-centredness, a concept embedded in all integrated care frameworks, but minimally addressed in research on integrated care to date. In Chapter 6, I explicitly took a system-level approach by examining system-oriented outcomes. This approach allowed me to examine the characteristics of people that may not be best served by the current health and social systems. However, this method did not allow for studying the perspective of the patient, which may not align with a system perspective. For example, a discharge directly to nursing home from hospital was considered a poor outcome, when this could have been the desired outcome of the patient. A future direction would be to incorporate this patient perspective by asking patients and families about outcomes that are more relevant to their perspective, for example, if they were discharged to their desired location, if their needs were being met, and if they knew how their care was being coordinated.

The “concerns” variable that I developed for the analysis in Chapter 6 provided a small window into the experience of patients for whom it was difficult to meet their needs in community prior to their hospital admission. It was based on narrative information from families and care coordinators. This variable alludes to the challenges that exist in providing care in the community that would continue to exist when it comes time to safely support someone being discharged from the hospital. Community services are based on protocols that determine when and how services can be delivered that may be inadequate for a patient’s needs, or inconsiderate of patient preferences. Even more specific to the context of integration is that the services may be too fragmented for the patient to fully understand and maximize their use of the services. An important future direction in evaluating integrated care is to ask patients and families the extent to which services are meeting their needs and preferences, since integrated care is about using a holistic approach to services to meet needs, as well as coordinating these services.

In Chapter 9, I used literature that had systematically determined the features of integrated care to develop indicators. All three of the documents developed these features using the opinions of researchers or health care providers knowledgeable about integrated care. By using these three sources to develop the indicators, there is an implicit bias that the service providers are the experts, and may have resulted in a list of indicators that is biased towards system goals rather than patient-centredness. As such, future research needs to incorporate the patient voice to determine if these features or indicators are relevant to patient needs and preferences through patient engagement. Looking specifically at the patient perspective of the indicators proposed by this thesis would help establish validity in terms of ensuring that the indicators address the intention of integrated care to balance patient-centredness and system needs. Specifically, patients could be interviewed about their care transition experience, using the indicators as prompts to help determine how these features or indicators are relevant to the patient experience.

In Chapter 9, several of the indicators that were developed were based on data from standardized forms in the chart. Some indicators were specifically seeking to determine if standardized protocols or pathways were being implemented since integrated care frameworks advocate for using these tools to improve communication and continuity. This points to the tension between standardization to achieve efficiency, potentially at the detriment of individualization. My analysis determined that there were differences between wards in the use of standardized forms. This finding raises many questions, for example, did the wards that did not use standardized forms in fact have poorer communication and continuity, or did they make up for the lack of the standardized form in a different way? And, did not using the standard form impede or promote the ability to take a more individualized approach? Future directions would be examine the use of these forms and how they correlate with patient and system outcomes, and patient and provider experience to determine if this standardization promotes the delivery of more streamlined care, or if it detracts from patient-centred dialogue.

Since this thesis used chart data, the findings may have reinforced a system perspective since health professionals construct these patient records. An interesting future direction would be to incorporate family and patient perspectives in patient charts as an intervention that aimed to improve the inclusion of family and patients and the patient-centredness of care delivery.

Overall, if health care practitioners, policy makers and researchers are serious about integrated care being patient-centred, we need to consider the inclusion of the patient perspective in all aspects of service design and evaluation. This needs to start with including the patient perspective in determining what aspects of integrated care are most relevant to the patient experience, and then needs to include the patient perspective in determining outcomes in relation to the patient-centered component of integrated care. Revealing where system and patient needs contradict and where they align would be a helpful start towards determining how to best balance the needs at both micro and macro levels.

10.5 Concluding Statement

In conclusion, this work approached the issue of care transitions for older adults using an integrated care lens. This was a new perspective in the care transitions literature and allowed for considering care transitions in ways that have not been emphasized previously in the literature. The integrated care framework expanded the traditional focus on mechanistic hospital interventions, to interventions at multiple levels, or domains of care. It also helped to broaden out from a hospital-centric view of mechanistic discharge planning steps, to consider more of the continuum of care involved in the transition. In particular, it helped with considering the preadmission status and needs and how this influenced the care transition between hospital and community. Finally, the integrated care lens allowed me to simultaneously address many issues that are documented in the care transitions literature, such as the need for patient-centred care, the need for timely communication, and the need for coordination between hospital and community services.

Overall, this work provides a important knowledge base to understand care transitions through the lens of integrated care. This theoretical shift in viewing the needs of older adults with frequent care transitions is important in supporting and promoting community-based care as much as possible for complex populations with continuing care needs. This foundational work can support future research on how integrated care approaches can improve care transitions for older adults with continuing care needs.

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Appendix A: Data Abstraction Guide

Variable / Field Name	Form Name	Section Header	Field Type	Field Label	Choices, Calculations, OR Slider Labels	Definition/Recording Decisions
record_id	hsc_data		text	Study ID		**The ID number that REDCap assigns to each new file.**
chart_id	hsc_data		text	Chart ID		**The HSC chart #.**
dc_date	hsc_data		text	Date of Discharge		**The date of discharge as recorded in HSC report.**
dc_dispos	hsc_data		dropdown	Discharge disposition	02, 02 continuing care | 04, 04 home with supports	**The discharge disposition as recorded in the HSC report.**
admit_date	hsc_data		text	Date of Admission		**The date of admission as recorded in HSC report.**
dob	hsc_data		text	Date of Birth		**Patient DOB as recorded in HSC report.**
preadmit_pc	hsc_data		text	Postal Code		**Patient postal code ON ADMISSION.**
los	hsc_data		text	Length of stay		**Length of stay in hospital in days as recorded in HSC chart.**
sex	hsc_data		dropdown	Sex	1, Female | 2, Male	**Sex as recorded in HSC report**
alc	hsc_data		dropdown	ALC?	1, No | 2, Yes	**Whether or not had ALC status during stay as per HSC report**
alc1_date	hsc_data		text	ALC Date First Time		**The date became ALC status as per HSC report.**

reassign_acute	hsc_data		text	Date Reassigned Acute Status		**The date went back to acute care as per HSC report.**
alc2_date	hsc_data		text	Date Reassigned ALC for Second Time		**The date ALC for second time as per HSC report.**
flag_int	hsc_data		dropdown	Flagged Intervention	1, biopsy | 2, cardioversion | 3, chemotherapy | 4, dialysis | 5, endoscopy | 6, feeding tube | 7, heart resuscitation | 8, paracentesis | 9, ventilation | 10, none	**Any flagged interventions as per HSC report.**
pt_1service	hsc_data		dropdown	Patient Service 1	1, ACT-acute care/trauma | 2, addictions unit | 3, ALC | 4, cardiology | 5, general medicine | 6, nephrology | 7, oncology | 8, orthopedic surgery | 9, orthopedic surgery on RR6 | 10, plastic surgery | 11, radiotherapy | 12, respirology | 13, thoracic surgery	**Service 1 patient was under as per HSC report**
pt_1servicelos	hsc_data		text	Patient Service 1 LOS		**LOS on service 1 as per HSC report.**
pt_2service	hsc_data		dropdown	Patient Service 2	1, ACT-acute care/trauma | 2, addictions unit | 3, ALC | 4, cardiology | 5, general medicine | 6, nephrology | 7, oncology | 8, orthopedic surgery | 9, orthopedic surgery on RR6 | 10, plastic surgery | 11, radiotherapy | 12, respirology | 13, thoracic surgery	**Service 2 as per HSC report**
pt_2servicelos	hsc_data		text	Patient Service 2 Length of Stay		**LOS service 2 as per HSC report**

pt_3service	hsc_data		dropdown	Patient Service 3	1, ACT-acute care/trauma | 2, addictions unit | 3, ALC | 4, cardiology | 5, general medicine | 6, nephrology | 7, oncology | 8, orthopedic surgery | 9, orthopedic surgery on RR6 | 10, plastic surgery | 11, radiotherapy | 12, respirology | 13, thoracic surgery	**Service 3 as per HSC report**
pt_3servicelos	hsc_data		text	Patient Service 3 Length of Stay		**Service 3 LOS as per HSC report**
dx_mostresp	hsc_data		text	Most Responsible Diagnosis		**Diagnosis most resonsible for majority of LOS as per HSC report.**
preadmit_1dx	hsc_data		text	Diagnosis present pre-admission		**Any diagoses present prior to admission as per HSC report.**
. . . preadmit_6dx	hsc_data		text	Diagnosis present pre-admission		**Any diagoses present prior to admission as per HSC report.**
postadmit_1dx	hsc_data		text	Diagnosis acquired post-admission		**Any diagnoses acquired in hospital as per HSC report.**
. . . postadmit_5dx	hsc_data		text	Diagnosis acquired post-admission		**Any diagnoses acquired in hospital as per HSC report.**
dx_2other	hsc_data		text	Diagnosis 2		**Other non-categorized diagnoses.**
. . . dx_24other	hsc_data		text	Diagnosis 24		**Other non-categorized diagnoses.**

language	forms	Inpatient Demographics Sheet	dropdown	Home Language	1, English | 2, French | 3, Italian | 5, Punjabi | 4, Tagalog | 6, Ukranian | 95, other | 99, information not in chart	**Language as per form.**
language_other	forms		text	Home Language Other		**Language as per form.**
contact_1 type	forms		dropdown	Contact 1 Type	1, not specified | 2, legal next of kin | 3, emergency | 5, primary | 6, family spokesperson | 95, other | 99, information not in chart	**Contact type as recorded in form.**
contact_1 relation	forms		dropdown	Contact 1 Relationship	1, not specified | 2, son | 3, daughter | 4, son-in-law | 5, daughter-in-law | 6, caregiver | 7, formal substitute decision maker | 8, brother | 9, sister | 10, wife | 11, husband | 12, friend | 13, granddaughter | 14, grandson | 15, niece | 16, nephew | 17, common-law | 99, information not in chart	**Contact relationship as recorded in form.**
contact_2 type	forms		dropdown	Contact 2 Type	1, not specified | 2, legal next of kin | 3, emergency | 5, primary | 6, family spokesperson | 95, other | 99, information not in chart	**Contact type as recorded on form.**

contact_2 relation	forms		dropdown	Contact 2 Relationship	1, not specified | 2, son | 3, daughter | 4, son-in-law | 5, daughter-in-law | 6, caregiver | 7, formal substitute decision maker | 8, brother | 9, sister | 10, wife | 11, husband | 12, friend | 13, granddaughter | 14, grandson | 15, niece | 16, nephew | 99, information not in chart	**Contact relationship as recorded on form.**
pcp_admission	forms		dropdown	Primary Care Provider Identified	1, No | 2, Yes | 3, PCP name not available	**If PCP name is listed on form, recorded as yes. If blank, recorded as known. If say "unknown", recorded as such.**
dc_screen	forms	Discharge Planning Screening Tool	dropdown	Discharge Planning Screening Form present	1, No | 2, Yes	**Is this form on chart?**
dc_screeningdate	forms		text	Date discharge screening form completed		**Date that the form was filled out. Use hand-written date (look both at top and bottom of chart). If both of those dates blank, use bradma date.**
dc_screeningphysio	forms		dropdown	Physiotherapy needed for dc planning	1, no consult required | 2, already consulted | 3, consult within 24 hours | 4, consult within 3 days | 5, not completed | 6, consult required	**Record excatly as indicated on form. If not filled in, indicate 'not completed'.**
dc_screeningot	forms		dropdown	Occupational Therapy needed for dc planning	1, no consult required | 2, already consulted | 3, consult within 24 hours | 4, consult within 3 days | 5, not completed | 6, consult required	**Record excatly as indicated on form. If not filled in, indicate 'not completed'.**

dc_screeningsw	forms		dropdown	Social Work needed for dc planning	1, no consult required | 2, already consulted | 3, consult within 24 hours | 4, consult within 3 days | 5, not completed | 6, consult required	**Record excatly as indicated on form. If not filled in, indicate 'not completed'.**
dc_screeninghc	forms		dropdown	Home Care needed for dc planning	1, no consult required | 2, already consulted | 3, consult within 24 hours | 4, consult within 3 days | 5, not completed | 6, consult required	**Record excatly as indicated on form. If not filled in, indicate 'not completed'.**
dc_screeningopen	forms		text	Details/Notes on Discharge Planning Screening Tool		**Record verbatim the notes in the open ended section on bottom of the form. If blank, write 'blank'. If extensive past medical history, can omit this as captured other places.**
admit_warddate	forms		text	Date from ED to ward		**As recorded at the bottom of this form. If blank, use the transfer note in the IPN to determine the date transferred to the ward.**
isolation	forms	Admission Request Form from Adult Emergency	dropdown	Needs isolation?	1, No | 2, Yes | 3, does not say if needed or not	**This is indicated on the form at the bottom for admission requirements. However, if you noticed switched to being on isolation during stay in orders, go back to this variable and change to 'needs isolation'.**

fall1_risk	forms	Fall risk: Patient Handling/Transfer/Falls Forms	text	Schmid fall risk score -first		**Record the score with the first date on these forms (note that it is a total of 2 numbers).**
fall2_risk	forms		text	Schmid fall risk score-last		**Record the score with the last date on these forms. If there is no second assessment, leave blank.**
pre_medcomplete	forms	Medications-Do not include PRN or dialysis only	dropdown	Medications Prior to Admission form completed?	1, No | 2, Yes	**Is this form in chart?**
pre_medsource	forms		text	Where was medication list from?		**If this form is not in chart, record how you determined pre-admission meds. Usually this form is consistently there. If not, you could try the admission note.**

pre_1med	forms		dropdown	Pre-admission medication 1	105, acetaminophen | 110, acetylsalicylic acid EC | 112, advair | 115, amLODIPine | 120, aricept | 125, ASA | 126, aspirin | 130, ativan | 135, atorvastatin | 140, baclofen | 145, candesartan | 150, carBAMazepine | 152, citalopram | 155, clopidogrel | 157, cloxacillin | 160, coumadin | 165, dalteparin | 170, diazepam | 175, digoxin | 177, domperidone | 180, esomeprazole | 182, ferrous sulphate | 185, furosemide | 190, gabapentin | 195, gliclazide | 200, handihaler | 205, heparin | 210, insulin (Humalog) lispro | 211, insulin (human) NPH | 215, indapamide | 217, ipratropium | 220, lasix | 222, levothyroxine | 225, lisinopril | 230, lorazepam | 232, L-thyroxine | 235, metformin | 240, metropolol | 245, mirtazapine | 250, nexium | 255, nitroglycerin | 260, nitropatch | 262, nystatin | 265, pantoprazole | 270, paroxetine | 275, plavix | 277, prednisone | 280, protonix | 285, remeron | 290, salbutamol | 295, seroquel | 300, sertraline | 305, spirara | 310, synthroid | 311, tamsulosin | 312, telmisavten | 313, temazepam | 315, tiotroprium | 320, tylenol | 325, valium | 327, ventolin | 330, zolof | 999, other	**Use these drop down boxes to record the NAME of each preadmission medication. DO NOT record PRN medications. We are not recording dose or route. If the med is not in the dropdown box, record in the "other" box at the end. OR, if it is easier, you can just type all the preadmission meds into the "other" med instead of using the drop down options.**

. . .pre_18 med	forms		dropdown	Pre-admission medication 18	105, acetaminophen | 110, acetylsalicylic acid EC | 112, advair | 115, amLODIPine | 120, aricept | 125, ASA | 126, aspirin | 130, ativan | 135, atorvastatin | 140, baclofen | 145, candesartan | 150, carBAMazepine | 152, citalopram | 155, clopidogrel | 157, cloxacillin | 160, coumadin | 165, dalteparin | 170, diazepam | 175, digoxin | 177, domperidone | 180, esomeprazole | 182, ferrous sulphate | 185, furosemide | 190, gabapentin | 195, gliclazide | 200, handihaler | 205, heparin | 210, insulin (Humalog) lispro | 211, insulin (human) NPH | 215, indapamide | 217, ipratropium | 220, lasix | 222, levothyroxine | 225, lisinopril | 230, lorazepam | 232, L-thyroxine | 235, metformin | 240, metropolol | 245, mirtazapine | 250, nexium | 255, nitroglycerin | 260, nitropatch | 262, nystatin | 265, pantoprazole | 270, paroxetine | 275, plavix | 277, prednisone | 280, protonix | 285, remeron | 290, salbutamol | 295, seroquel | 300, sertraline | 305, spirara | 310, synthroid | 311, tamsulosin | 312, telmisavten | 313, temazepam | 315, tiotroprium | 320, tylenol | 325, valium | 327, ventolin | 330, zolof | 999, other	
pre_meds _other	forms		notes	Other preadmission medications		**Note if not on any medications.**
dc_med	forms		dropdown	Transfer or discharge medication orders/reconciliation form present?	1, No | 2, Yes	**Is this form in chart?**

dc_medsource	forms		text	Discharge medication list taken from?	**If this form isn't in chart, record where you got the information about medications. You can check the discharge summary. As a last resort, you can go to the last nursing medication flow sheet entry.**

dc_1med	forms		dropdown	Discharge medication 1	105, acetaminophen | 110, acetylsalicylic acid EC | 112, advair | 115, amLODIPine | 120, aricept | 125, ASA | 126, aspirin | 130, ativan | 135, atorvastatin | 140, baclofen | 145, candesartan | 150, carBAMazepine | 152, citalopram | 155, clopidogrel | 157, cloxacillin | 160, coumadin | 165, dalteparin | 170, diazepam | 175, digoxin | 177, domperidone | 180, esomeprazole | 182, ferrous sulphate | 185, furosemide | 190, gabapentin | 195, gliclazide | 200, handihaler | 205, heparin | 210, insulin (Humalog) lispro | 211, insulin (human) NPH | 215, indapamide | 217, ipratropium | 220, lasix | 222, levothyroxine | 225, lisinopril | 230, lorazepam | 232, L-thyroxine | 235, metformin | 240, metropolol | 245, mirtazapine | 250, nexium | 255, nitroglycerin | 260, nitropatch | 262, nystatin | 265, pantoprazole | 270, paroxetine | 275, plavix | 277, prednisone | 280, protonix | 285, remeron | 290, salbutamol | 295, seroquel | 300, sertraline | 305, spirara | 310, synthroid | 311, tamsulosin | 312, telmisavten | 313, temazepam | 315, tiotroprium | 320, tylenol | 325, valium | 327, ventolin | 330, zolof | 999, other	**Use these drop down boxes to record the NAME of each discharge medication. DO NOT record PRN medications. Also remember not to record the medications that are marked as "discontinue". You can record the ones that are marked as a chenge. We are not recording dose or route. If the med is not in the dropdown box, record in the "other" box at the end. OR, if it is easier, you can just type all the preadmission meds into the "other" med instead of using the drop down options.**

. . . dc_18med	forms		dropdown	Discharge medication 18	105, acetaminophen | 110, acetylsalicylic acid EC | 112, advair | 115, amLODIPine | 120, aricept | 125, ASA | 126, aspirin | 130, ativan | 135, atorvastatin | 140, baclofen | 145, candesartan | 150, carBAMazepine | 152, citalopram | 155, clopidogrel | 157, cloxacillin | 160, coumadin | 165, dalteparin | 170, diazepam | 175, digoxin | 177, domperidone | 180, esomeprazole | 182, ferrous sulphate | 185, furosemide | 190, gabapentin | 195, gliclazide | 200, handihaler | 205, heparin | 210, insulin (Humalog) lispro | 211, insulin (human) NPH | 215, indapamide | 217, ipratropium | 220, lasix | 222, levothyroxine | 225, lisinopril | 230, lorazepam | 232, L-thyroxine | 235, metformin | 240, metropolol | 245, mirtazapine | 250, nexium | 255, nitroglycerin | 260, nitropatch | 262, nystatin | 265, pantoprazole | 270, paroxetine | 275, plavix | 277, prednisone | 280, protonix | 285, remeron | 290, salbutamol | 295, seroquel | 300, sertraline | 305, spirara | 310, synthroid | 311, tamsulosin | 312, telmisavten | 313, temazepam | 315, tiotroprium | 320, tylenol | 325, valium | 327, ventolin | 330, zolof | 999, other	
dc_meds_other	forms		notes	Other discharge medications		
count_docs	orders		text	Number of attending physicians		**Count the number of attendings over the course of the stay using the bradma.**
ward_first	orders		dropdown	Ward admitted to (ward 1)	1, A4 | 2, D4 | 3, H4 | 4, CCDU | 6, D5 | 7, H6 | 8, H7 | 9, J3 | 10, RR6 | 95, other	**Record the ward the patient was on and transferred to. The easiest way is using the bradma, but once you are in the IPN's, if you notice another ward not captured by the bradma, you can go back and change.**

ward_second	orders		dropdown	Ward transfer (ward 2)	1, A4 | 2, D4 | 3, H4 | 4, CCDU | 6, D5 | 7, H6 | 8, H7 | 9, J3 | 10, RR6 | 95, other	**Record the ward the patient was on and transferred to. The easiest way is using the bradma, but once you are in the IPN's, if you notice another ward not captured by the bradma, you can go back and change.**
ward_third	orders		dropdown	Ward transfer (ward 3)	1, A4 | 2, D4 | 3, H4 | 4, CCDU | 6, D5 | 7, H6 | 8, H7 | 9, J3 | 10, RR6 | 95, other	**Record the ward the patient was on and transferred to. The easiest way is using the bradma, but once you are in the IPN's, if you notice another ward not captured by the bradma, you can go back and change.**
alone	preadmission_social		dropdown	Lives alone?	1, lives alone | 2, lives with one other person | 4, lives with more than one other person | 5, does not live alone but not clear how many lives with | 99, information not available in chart	**Lives alone?**
marital_status	preadmission_social		dropdown	Marital Status	1, not indicated | 2, married | 3, never married | 4, previously married | 95, other | 99, information not available in chart	**Feel free to use other if not sure what to indicate.**
mar_status_other	preadmission_social		text	Marital Status Other		

pre_informalcare	preadmission_social	notes	Informal caregivers and their roles prior to admission and ability to continue care		**Who was providing unpaid caregiving to the patient? What did they help with and with what frequency?**
pre_homecare	preadmission_social	dropdown	Manitoba home care previous to admission?	1, No | 2, Yes | 99, information not available in chart	**Record YES if had any type of home preadmission. Private services is not included here.**
pre_concerns	preadmission_social	notes	Preadmission concerns of client's ability to manage in community or with current care levels and plans to address		**Was there any concerns noted AT ADMISSION or PRIOR to admission to indicate that there were concerns with how this person was managing? Would be recorded in the home care community notes or in the admission notes if family provides information about concerns at admission. For all preadmission status variables: If the functional status has lasted more than one month then it is coded as their preadmission status. Example - previously ind with one week onset back pain which required the person to have help = previously ind. 2 months of requiring help due to new onset of condition = requires help.**

mtx_pre_bathing	preadmission_function	Pre-admission ADL's	checkbox	Preadmission bathing	1, ind. +/- equipt | 2, set up | 3, SBA | 4, supervision | 5, min A | 6, mod A | 7, max A | 8, 1 person A | 9, 2 person A | 10, mech. lift | 11, does not do | 99, no info	**Bathing = ability to bathe self including sponge bath. For all function, continence, mobility, record the WORST performance if contrdictory information or fluctuating status.**
mtx_pre_toilet	preadmission_function		checkbox	Preadmission toileting	1, ind. +/- equipt | 2, set up | 3, SBA | 4, supervision | 5, min A | 6, mod A | 7, max A | 8, 1 person A | 9, 2 person A | 10, mech. lift | 11, does not do | 99, no info	**Toileting = ability to carry out toileting once at toilet (not getting there or transfer). Includes clothing management. Managing any incontinence pads if needed and peri-care.**
pre_bladder	preadmission_function	Preadmission Bowel and Bladder Control	dropdown	Preadmission bladder	1, continent | 2, sometimes incontinent | 3, incontinent | 4, catheter | 5, anuric | 95, other | 99, information not available in chart	
pre_blad_other	preadmission_function		text	Preadmission bladder other		
pre_med help	preadmission_function	Medication Management	checkbox	Pre-admit medication - HOW and WHO	1, not documented | 2, bubble pack | 3, dosette | 4, locked box | 5, independent | 6, assist from informal caregivers | 7, assist from home care | 95, other	**Check as many boxes as needed +/- "other" to indicate the HOW and WHO of medication mgt**
pre_meds other	preadmission_function		text	Pre-admission medications other		

mtx_pre_inloco	preadmission_function		checkbox	Preadmission indoor locomotion	1, ind.+/- equipt | 2, set up | 3, SBA | 4, supervision | 5, min A | 6, mod A | 7, max A | 8, 1 person A | 9, 2 person A | 10, mech. lift | 11, does not do | 99, no info	**Ability to walk in home.**
pre_walkaidin	preadmission_function		dropdown	Walking aid indoors	1, cane | 2, 2 wheeled walker | 3, 4 wheeled walker | 4, walker unspecified | 5, manual wheelchair | 6, power wheelchair | 7, wheelchair unspecified | 8, ambulates without aid | 95, other | 99, information not available in chart	**What walking aid was used indoors?**
pre_walkaidother	preadmission_function		text	Mobility aid other		
pre_orientation	preadmission_function	Preadmission Cognition	dropdown	Pre-admit Orientation	1, oriented x3 | 2, orientedx2 | 3, oriented x1 | 4, not oriented at all | 5, partially oriented unspecified | 6, oriented unspecified | 95, other | 99, information not available in chart	**Record any indication of orientation. Would be in a home care community note or a GPAT type of note. Can use "other" and record verbatim if not sure.**
pre_orient_other	preadmission_function		text	Pre-admit Orientation Other		
pre_cog	preadmission_function		notes	Pre-admission cognition		**Record any information about cognition that is recorded in preadmission reports from community/home care. If not present, can use family report if present in IPN's.**

pre_sens	preadmission_function	Preadmission Sensory	text	Preadmission Sensory		**Record information about sensory - usually in home care community notes.**
pre_behavior	preadmission_function	Preadmission Behavior and Mood	checkbox	Challenging behaviors pre-admit?	1, no documentation of behavioral symptoms | 2, wandering | 3, verbally abusive | 4, physically abusive | 5, socially disruptive, | 6, resists care | 95, other	**Don't hesitate to use "other" option.**
pre_beh_other	preadmission_function		text	Behavioral other		
pre_infocontext	preadmission_function	Context of the preadmission information	notes	Preadmission information context		**Indicate if from home care community care plan and date the plan was made if yes. Otherwise indicate where this information was recorded.**
consult_1service	multidisciplinary_team		dropdown	Provider/Service #1 Consulted	1, SW | 2, PT | 3, OT | 4, HC | 5, SLP | 6, nutrition | 7, long term care access centre (LTCAC) | 16, bed utilization | 12, CCDU | 8, chest medicine | 15, dentistry | 13, foot care nurse | 14, geriatric nurse clinician (Christine) | 19, ger-rehab | 25, geri-psychiatry | 17, GI | 22, GMAT | 23, GPAT | 10, medicine | 9, neurosurgery | 26, ortho | 29, palliative care | 18, pharmacy | 11, psychiatry | 27, rehab engineering | 21, spine service | 20, spiritual care | 28, urology | 95, other	**Use drop down to choose a member of the multidisciplinary team that was consulted through a consult sheet, in the orders, or who was not formally consulted, but contributed to care and wrote an IPN about it.**

consult_1other	multidisciplinary_team	text	Provider/Service # Consulted Other	**Use other if not in drop down. In particular, use drop down for RENAL dietician and RENAL SW.**
consult_1date	multidisciplinary_team	text	Date Provider/Service #1 Consulted	**Use the date that the consult was written (order date or the date at top of consult sheet or date of IPN). If not present, can use the date of bradma on the consult.**
consult_1involvement	multidisciplinary_team	checkbox	Consult #1 involvement	1, direct visit in ED | 2, more than one direct visit in ED | 4, direct visit on ward | 5, more than one direct visit on ward | 7, indirect ED | 8, indirect ward
consult_1recs	multidisciplinary_team	notes	Consult #1 Recommendations Directly Related to Admission or Discharge Planning	
. . . consult_15service	multidisciplinary_team	dropdown	Provider/Service #15 Consulted	1, SW | 2, PT | 3, OT | 4, HC | 5, SLP | 6, nutrition | 7, long term care access centre (LTCAC) | 16, bed utilization | 12, CCDU | 8, chest medicine | 15, dentistry | 13, foot care nurse | 14, geriatric nurse clinician (Christine) | 19, ger-rehab | 25, geri-psychiatry | 17, GI | 22, GMAT | 23, GPAT | 10, medicine | 9, neurosurgery | 26, ortho | 29, palliative care | 18, pharmacy | 11, psychiatry | 27, rehab engineering | 21, spine service | 20, spiritual care | 28, urology | 95, other
consult_15other	multidisciplinary_team	text	Provider/Service #15 Consulted Other	
consult_15date	multidisciplinary_team	text	Date Provider/Service #15 Consulted	
consult_15involvement	multidisciplinary_team	checkbox	Consult #15 involvement	1, direct visit in ED | 2, more than one direct visit in ED | 4, direct visit on ward | 5, more than one direct visit on ward | 7, indirect ED | 8, indirect ward

consult_15recs	multidisciplinary_team		notes	Consult #15 Recommendations Directly Related to Admission or Discharge Planning		
dc_log	hospital_discharge_planning	Discharge Rounds Action Log	dropdown	Discharge Rounds Log Present?	1, No | 2, Yes	**Is this form in chart?**
dc_log1date	hospital_discharge_planning		text	Date of first entry in discharge rounds action log		**As per form**
dc_log1action	hospital_discharge_planning		text	Update and action plan 1		**Verbatim as per form. Unless extensive past med history or medical intervention in hospital - that can be left out (often if this is there it is in the first entry).**
meeting_first	hospital_discharge_planning	Meetings for Discharge Planning	text	Meeting regarding care transition 1		**Was there a meeting to plan discharge? The chart would usually indicate "discharge planning meeting" or "family meeting". If there is a meeting that seems les formal but included several team members, you could indicate that here. Note who attended, the goal and outcome of meeting.**
meeting_second	hospital_discharge_planning		text	Meeting regarding care transition 2		

dc_other	hospital_discharge_planning	Other Information Not Otherwise Captured Regarding Discharge Planning Process	notes	Barriers or facilitators to discharge planning or discharge not noted in Discharge Rounds Action Log		**This might be something a care provider documented. If there is something you noted, put: "Researcher notes: . . . . ."**
hosp_mob1_date	mobility_first_recording	First Recording Hospital Mobility	text	Date of First Recording of Mobility		**This variable has been eliminated.**
mtx_hosp1_inloco	mobility_first_recording		checkbox	Indoor locomotion	1, ind.+/- equipt | 2, set up | 3, SBA | 4, supervision | 5, min A | 6, mod A | 7, max A | 8, 1 A | 9, 2 A | 10, mech. lift | 95, other | 99, no info	**This variable has been eliminated.**
hosp1_mob_other	mobility_first_recording		text	First hospital recording mobility other		**This variable has been eliminated.**
hosp1_amb_eqipt	mobility_first_recording		radio	Ambulation equipment needed	1, cane | 2, 2 wheeled walker | 3, 4 wheeled walker | 4, walker unspecified | 5, not walking at all | 6, no walking aid required | 95, other | 99, does not specify if needs aid or not	**This variable has been eliminated.**

hosp1_amb_eother	mobility_first_recording		text	Ambulation Aid Other		**This variable has been eliminated.**
adl_hosp2_date	adl_and_mobility_last	Last Recorded ADL in Hospital	text	Last Recorded ADL Date		**What date did you use for the next variables? Use an OT note if available within last week or so of dc. Otherwise used best nursing note.**
mtx_hosp2_toilet	adl_and_mobility_last	Last Recorded ADL	checkbox	Toileting	1, ind. +/- equipt | 2, set up | 3, SBA | 4, supervision | 5, min A | 6, mod A | 7, max A | 8, 1 A | 9, 2 A | 10, mech. lift | 95, other | 99, no info	**Definitions are the same as for preadmission status.**
hosp2_toilbath_other	adl_and_mobility_last		text	Toileting/Bathing Other		**Definitions are the same as for preadmission status.**
hosp2_bladder	adl_and_mobility_last		dropdown	Last Recorded Bladder	1, continent | 2, sometimes incontinent | 3, incontinent | 4, foley catheter | 5, anuric | 95, other | 99, no info	**Definitions are the same as for preadmission status.**
hosp2_bb_other	adl_and_mobility_last		text	Other Bowel and Bladder Last Recorded		**Definitions are the same as for preadmission status.**
mobility_hosp2_date	adl_and_mobility_last	Last Recorded Hospital Mobility	text	Last Recorded Mobility Date		**What date was the information recorded for the next variables? Use the last PT note if available within a week or so of dc. If not, use best nursing note.**

mtx_hosp2_inloco	adl_and_mobility_last		checkbox	Indoor walking	1, ind.+/- equipt | 2, set up | 3, SBA | 4, supervision | 5, min A | 6, mod A | 7, max A | 8, 1 A | 9, 2 A | 10, mech. lift | 95, other | 99, no info	**Same definitions as preadmission variables.**
last_mob_other	adl_and_mobility_last		text	Mobility Other		**Same definitions as preadmission variables.**
hosp2_mob_aid	adl_and_mobility_last		dropdown	Last Recorded Mobility Aid	1, cane | 2, wheeled walker unspecified | 3, 2 wheeled walker | 4, 4 wheeled walker | 5, wheelchair | 6, power wheelchair | 7, ambulates without aid | 95, other | 99, does not say if needs aid or not	**Same definitions as preadmission variables.**
hosp2_mobaidoth	adl_and_mobility_last		text	Last Recorded Mobility Aid Other		**Same definitions as preadmission variables.**
dc_iadl	adl_and_mobility_last	Last Recorded IADL	notes	Any IADL Assessment Results		**Record results of any IADL assessment such as meal pre, finances.**
cog_st	cognition_mood_behavior		text	Standardized Cognitive Assessment		**Record any cognitive tests done DURING ADMISSION. If done pre-admission, record in the pre-admission information. Record date, instrument used and score. Indicate if none.**
hosp_orient1_date	cognition_mood_behavior		text	Date of First Hospital Recording of Orientation		**Use the nursing admission record or nursing admission note if possible.**
hosp_1orient	cognition_mood_behavior		checkbox	First Hospital Recording of Orientation	1, oriented x3 | 2, orientedx2 | 3, oriented x1 | 4, not oriented at all | 5, partially oriented unspecified | 95, other | 99, no information on orientation	**Use the nursing admission record or nursing admission note if possible.**

hosp_1orientother	cognition_mood_behavior	text	First Recording Orientation Other		
hosp_orient2_date	cognition_mood_behavior	text	Date of Last Hospital Recording of Orientation		**Use the discharge note if possible, or closest recording to discharge in IPN.**
hosp_2orient	cognition_mood_behavior	checkbox	Last Hospital Recording of Orientation	1, oriented x3 | 2, orientedx2 | 3, oriented x1 | 4, not oriented at all | 5, partially oriented unspecified | 95, other | 99, information not available in chart	**Use the discharge note if possible, or closest recording to discharge in IPN.**
hosp2_orientother	cognition_mood_behavior	text	Last Recording Orientation Other		
cog_hosp	cognition_mood_behavior	notes	Cognition in Hospital		**Any other information about cognition noted during hosptilziation. If there was a period of poor cognition, indicate if it resolved or not if possible.**
beh_ed	cognition_mood_behavior	checkbox	Challenging Behaviors in ED	1, no documentation of behavioral symptoms | 2, wandering | 3, verbally abusive | 4, physically abusive | 5, socially disruptive, | 6, resists care | 7, agitated | 95, other	
beh_ed_other	cognition_mood_behavior	text	Challenging Behavior in ED Other		
beh_ward	cognition_mood_behavior	checkbox	Challenging Behaviors While on Ward	1, no documentation of behavioral symptoms | 2, wandering | 3, verbally abusive | 4, physically abusive | 5, socially disruptive, | 6, resists care | 7, agitated | 95, other	
beh_ward_other	cognition_mood_behavior	text	Challenging Behaviors on Ward Other		

pt_involve	client_and_family	notes	Patient Involvement in Discharge Planning		**Extract information about discussions with patient about their disposition or discharge planning. If there is A LOT, provide some examples and indicate the volume and theme such as "multiple entries by OT, PT, nursing and SW about discussing the discharge plan with the patient and provision of teaching for managing at home. Patient is not concerned at all about discharge and professionals are very worried about how he will manage."**
family_involve	client_and_family	notes	Family/caregiver Involvement in Discharge Planning		**As above but as related to the family or friends.**
hosp_comm_int1date	community_interaction	text	Date community/hospital communication 1		**Date that there was some type of communication or interaction with other facilities, services or professionals that are not HSC professionals.**
comm_int1who	community_interaction	dropdown	Community Provider/Service 1	1, community home care coordinator | 2, community home care service | 3, GPAT | 4, GMAT | 5, chief psychiatrist | 6, long term access centre | 7, personal care home | 8, paramedic | 9, RANA | 10, Rehab and Geriatrics Central Waitlist | 95, other	
comm_1whoother	community_interaction	text	Community Provider/Service Other 1		

comm_1how	community_interaction	dropdown	Type Interaction 1	1, report regarding preadmission care/ status | 2, paramedic report | 3, other correspondence | 4, verbal face-to-face communication | 5, assess client during hospitalization | 6, telephone communication | 7, referral | 95, other	
comm1_howother	community_interaction	text	Type of Interaction 1 Other		
comm_int1what	community_interaction	text	Content of interaction 1		**Not needed if the communication was done with a standard format/form such as the home care community care plans, the paramedic reports, the geri-rehab waitlist forms.**
. . .hosp_comm_int10date	community_interaction	text	Date community/hospital communication 10		
comm_int10who	community_interaction	dropdown	Community Provider/Service 10	1, community home care coordinator | 2, community home care service | 3, GPAT | 4, GMAT | 5, chief psychiatrist | 6, long term access centre | 7, personal care home | 8, paramedic | 9, RANA | 10, Rehab and Geriatrics Central Waitlist | 95, other	
comm_10whoother	community_interaction	text	Provider/Service 10 Other		
comm_10how	community_interaction	dropdown	Type Interaction 10	1, report regarding preadmission care/ status | 2, paramedic report | 3, other correspondence | 4, verbal face-to-face communication | 5, assess client during hospitalization | 6, telephone communication | 95, other	
comm_10howother	community_interaction	text	Type Interaction 10 Other		
comm_int10what	community_interaction	text	Content 10		

dc_dispos_specific	discharge_information		text	Discharge Disposition Details		
dc_summary	discharge_information	Discharge Summary	dropdown	Discharge Summary Present?	1, No | 2, Yes	**Typed discharge summary by physician present?**
dc_summarydic_date	discharge_information		text	Date DC Summary Dictated (just date if does not have dictation and transcription dates)		**If a renal chart, may not be both dates. Put the date of summary here if there is one.**
dcsummary_datetr	discharge_information		text	Date DC Summary Transcribed (blank if does not have both the dictation and transcription dates)		
dc_summary_cc	discharge_information		text	DC Summary cc to:		**If there is an MD listed, flip back to the PCP provided on the inpatient demographics form**
stay_summary	discharge_information		notes	Summary of course of stay		**Take out summary information regarding the trajectory of the stay. Do not need to include detailed medical inforamtion but read through because there is often information about the follow-up needed here that you can transfer to theboxes about follow-up appointments and need on discharge.**
hc_dc	discharge_information	Home Care for Discharge	radio	Manitoba Home Care Planned for Discharge?	1, No | 2, Yes	
dc_hc	discharge_information		text	Home care services in place on discharge?		

fu_appt_rec	discharge_information	Follow-up Needed or Recommended	text	Follow-up appointments recommended		**Any follow-up appts with family dr or specialists or clinics.**
fu_appts	discharge_information		text	Follow-up appointments made prior to dc?		**Was there any evidence in chart that the appt was or was not made yet? For example: "patient to make follow-up appt with own GP" or "patient given information on follow-up appt on date and time"**
dc_fu_other	discharge_information		text	Any other non-medical follow-up needs and plans to meet these needs not yet indicated		**This might be a need for change in housing to be done in community, or panel to be done in community.**
dc_info_sheet	discharge_information		dropdown	Discharge Information Sheet present?	1, No | 2, Yes	**Is this form in chart? It is typically only there for discharges to home.**
dc_info_sheet_instr	discharge_information		text	Discharge Sheet diet and activity instructions		**Write verbatim regardless of whether or not you think that it is accurate.**
dc_info_sheet_fu	discharge_information		text	Discharge Sheet Follow-Up Plans		**Write verbatim regardless of whether or not you think that it is accurate.**