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Acute-To-Home Care Nursing Handoffs: Distributed Cognition Across Patterns of Knowledge

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For my husband, Mark, and my children,
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ABSTRACT

Timely, explicit, and effective communication of patient information during care transitions is fundamental to safe care. Studies show that handoffs or transfers of patient care from one provider to another are susceptible to communication failures (Riesenbera et al., 2009a). Most studies on communication failures focus on communication between providers within the same setting of care. Few studies, if any, focus on communication between care settings in different locations. However, research has identified gaps in care during critical transitions and identified poor communication and incomplete transfer of information as the root cause (Naylor et al., 2004). This qualitative dissertation consists of seven research questions aimed at understanding dimensions of nursing roles, patterns of communication, data exchanged, and communication channels related to acute-to-home care handoffs.

This study uses an integrated theoretical framework encompassing cognition theory, patterns of knowledge theory, and clinical communication space theory, which in parallel, represent key aspects of acute-to-home care handoffs. To describe these concepts and variables, the Event Analysis of Systematic Teamwork methods were used to describe acute-to-home care patient handoff distributed cognition and patterns of communication related to: role dimensions, tasks, and activities within the handoff process; data, information and knowledge shared; and communication channels used. In addition, the study described how the International Classification of Nursing Practice
(ICNP) and the Quality Data Model (QDM) represent communication of nursing diagnoses and goals as patients transition from acute-to-home care settings. The study revealed a very complex and fragmented process devoid of acute-care nursing representation in decision-making regarding post-discharge care and in sharing of data in the acute-to-home care handoff. A comparison of medical versus nursing diagnoses shared in acute-to-home care handoffs revealed that less than 7% of the inpatient nursing diagnoses were shared, while over 80% of the inpatient medical diagnoses were shared in the acute-to-home care handoff. Furthermore, inpatient nursing plan of care on the day of discharge is not shared in acute-to-home care handoffs. However, when the home care nurse completes the initial home care visit, the problems and goals on the home care plan of care reflect similar domains of care as the inpatient day of discharge plan of care. But the plan of care in the acute-to-home care handoff has no nursing care content. This black box between inpatient care and home care is revealed when the patient tells their story and the home care nurse performs an assessment that leads to a plan of care. This is exacerbated by single threaded one-way communication channels during the acute-to-home care handoffs.

This study demonstrated how patterns of knowledge (handoff content), when sent through communication channels (electronic, face-to-face, handwritten notes and phone) that enable shared cognition and collaboration, are more effective. The study revealed that nursing documentation in the inpatient record is not used by anyone on the clinical team for the acute-to-home care handoff. A review of the artifacts revealed a strong medical model of information exchange, potentially demonstrating a continuation
of medical care following physician orders. Furthermore, inpatient nursing plan of care on the day of discharge is not shared in acute-to-home care handoffs. However, when the home care nurse completes the initial home care visit, the problems and goals on the home care plan of care reflect similar domains of care as the inpatient day of discharge plan of care. However, the plan of care in the acute-to-home care handoff has no nursing care content. These findings are consistent with the literature. The concept of a dynamic plan of care that is not relinquished upon discharge warrants investigation. The results of this study will inform future efforts related to process improvement and data standardization for purposes of facilitating coordination of care across the care continuum.
CHAPTER ONE
INTRODUCTION

Care Coordination and Transitional Care

The coordination of care is an essential component of care delivery both within and across healthcare settings. The National Priorities Partnership, a 48-member organizational group responsible for recommending strategies to achieve better healthcare, has identified care coordination as one of the top national healthcare priorities (National Priorities Partnership, 2008). The Agency for Healthcare Research and Quality (AHRQ) performed a systematic review of 4,730 publications to develop a standardized definition of care coordination (AHRQ, 2008). Care coordination is defined as the deliberate organization of patient care activities between two or more participants involved to facilitate delivery of appropriate services (AHRQ, 2007). This involves the exchange of essential patient information among participants responsible for direct care delivery. To this extent, the Joint Commission on the Accreditation of Healthcare Organizations defines essential information as critical information or knowledge that must be communicated among care providers to maintain continuity of care (Bowles, Pham, O'Connor, & Horowitz, 2010). Frequently this information is exchanged during the handoff process, both within and across settings of care.
A complementary and more specific activity associated with care coordination is the concept of transitional care. Transitional care is 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, 2003). Similar to care coordination, these actions are exemplified within the acute-to-home care handoff process.

Handoff Definition

The provision of patient care depends on integrated communication processes, whereby complex patient information is passed between clinicians, both within and across settings. A critical communication process in healthcare is the “handoff process,” whereby there is an exchange of patient information as well as a transfer of accountability and responsibility for patient care (Alem, Joseph, Kethers, Steele, & Wilkinson, 2008; Anderson & Mangino, 2006; Benson, Rippin-Sisler, Jabusch, & Keast, 2006; Caruso, 2007; Kerr, 2002; Lardner, 1996; Manning, 2006; Riesenberg, Leitzsch, & Little, 2009a; Strople & Ottani, 2006). The first formal reference to handoffs was made in 1889, when nursing shift report was documented as vital to nursing practice (Kitson, 2000). Subsequently in 1969, Clair and Trussell (1969) defined oral shift report as an oral communication of pertinent information about patients during which events of the prior shift were described (Clair & Trussel, 1969). Recent handoff definitions refer to the real-time passing of patient/client/resident information from one caregiver or team of caregivers to another for the purpose of ensuring continuity and safety of the patient/client/resident (Gibson, Ham, Apker, Mallak, & Johnson, 2010; The Joint Commission, 2008a). In the 2006 National Patient Safety Goals, the Joint Commission
endorsed a standardized approach to handoffs that provides an opportunity for asking and responding to questions so each party has a clear understanding of who is responsible for every aspect of the patient’s care.

**Handoff Objectives**

During handoffs, a patient’s existing condition and plan of care are described so the receiving party can plan for and provide care to achieve desired outcomes. Handoffs play an important role in ensuring that all providers have an accurate understanding of the patient’s diagnosis, interdisciplinary plan of care, and current progress toward expected outcomes. According to the literature, it is assumed that from the information shared during handoffs, the nurse receiving the report will be able to plan care effectively for his or her patients (Dowding, 2001). Handoffs are also intended to transfer accountability and responsibility for care, preserve the flow of patient care activities, and facilitate coordination of care between disciplines across the continuum of care (Alem et al., 2008; Staggers & Jennings, 2009; The Joint Commission, 2008a). Handoffs are also intended to facilitate coordination of care between disciplines across the continuum of care (The Joint Commission, 2008b), building common understanding through interactive discussion between professionals regarding treatment and/or anticipated changes (Alem et al., 2008; The Joint Commission, 2008b).

**Handoff Methods and Process**

The handoff includes information from a combination of paper charts, computerized records, and memory recall. The exchange of information is conducted through various methods, such as nurse shift change; physicians transferring responsibility for a patient; clinicians transferring “on call” responsibility; temporary
acceptance of responsibility for patients; and nursing and physician handoffs between departments such as surgical to postoperative care, different inpatient settings, different hospitals, nursing homes, primary care providers, and home healthcare (Patterson & Wears, 2010). The ethnographic studies show that handoffs typically include the following: (1) a period of preparation by outgoing provider where data are collected from multiple sources and assimilated; (2) delivery of handoff, where outgoing and incoming parties exchange important information to provide a picture of the patient’s status; and (3) cross-checking of information and prioritizing of care needs by incoming nurses as responsibility is assumed for the next shift (Cheung et al., 2010; Lardner, 1996; Yonge, 2008). More recently, an ethnographic study on physician handoffs in the emergency department revealed additional phases: (1) an anticipatory, preparatory, immediate post-handover; and (2) post-handover (Lawrence, Tomolo, Garlis, & Aron, 2008).

Handoff Issues

General

The majority of nursing handoff problems identified in the research include the following: missing, unnecessary, or inaccurate information of variable quality; heavy focus on providing a retrospective review with little time spent on planning future goals; and failure to carry forward information over successive shifts (Lardner, 1996). The progressive loss of information has been connected with adverse events in patient handoffs (Strople & Ottani, 2006). Barriers to handoffs also include an inability to access the clinical information for the patient, frequent interruptions, idle chatting, agency staff requiring additional time, unclear report, and staff believing they had to justify what they did for the patient on their shift (Australian Council for Safety and Quality in Health...
Nursing handoffs can consume up to 10–30% of a shift, which equates to time away from patient care (Strople & Ottani, 2006). Further exploration of the literature reveals that nursing handoffs are primarily retrospective, with a focus on completion of medical orders and less on the interdisciplinary plan of care (Fenton, 2006; McMahon, 1990). In addition, the literature reveals variation in the quality, type, and structure of information depending on the provider, care setting, and handoff methods. This leads to the assumption that essential care is not continuously communicated from one shift to another (Fenton, 2006).

Communication Failures

Studies show that handoffs or transfers of patient care from one provider to another are susceptible to communication failures (Riesenberg et al., 2009a). More specifically, research indicates that the risk of a breakdown in the work of any critical system is significantly increased during transitions and that the consequences, both in health care and other high-risk environments, can be catastrophic (Kostopoulou & Shepherd, 2000; Lardner, 1996; Patterson & Wears, 2010). Patterson and Wears (2010) revealed that low-quality handoffs can result in inefficient and redundant communications between providers. In a review of 4,977 sentinel events that occurred between 1995 and 2008, the Joint Commission identified communication problems as one of the contributing causes in more than 60% of sentinel events reviewed (IOM, 2001; Manning, 2006; Riesenberg et al., 2009a). In addition, the Institute of Medicine (2003) identified breakdowns in communication as a cause of injuries in care. Both the Institute of Medicine and the Joint Commission emphasize the connection between accurate and effective communication among caregivers and quality patient outcomes (Cohen &
Hilligoss, 2009). Most studies on communication failures focus on communication between providers within the same setting of care. Few studies, if any, focus on communication between care settings in different locations. However, research has identified gaps in care during critical transitions and identified poor communication and incomplete transfer of information as the root cause (Naylor et al., 2004). In a study on hospital discharge communication to primary care, direct communication between the hospital and primary care setting occurred only 3% of the time (Dennison & Hughes, 2009). At discharge, a summary was provided only 12% of the time, and this occurrence remained poor at 4 weeks post-discharge, with only 51% of practitioners providing a summary. This standard affected quality of care in 25% of follow-up visits (Dennison & Hughes, 2009).

Measurement of Handoff Quality

Timely, explicit, and effective communication of patient information during care transitions is fundamental to safe care. Evidence suggests that deficient care quality during transitions is correlated with increasing poor outcomes after discharge. Essentially, poorly executed care transitions lead to compromised outcomes and dissatisfied patients ((Naylor, Kurtzman, & Pauly, 2009; Solet, Norvell, Rutan, & Frankel, 2005). In a study by Forster and colleagues, 19% of patients discharged from the hospital experienced a transition-associated adverse event within 3 weeks, and 66% of these events were related to medications (Forster, Murff, Peterson, Gandhi, & Bates, 2003). These findings were supported by (Kripalani et al., 2007) who revealed that 19–23% of patients discharged from a hospital suffer an adverse event, and nearly half are preventable instances pertaining to adverse drug events. In addition, almost 50% of
patients discharged from the hospital experience at least one adverse event related to medication continuity, diagnostic workup, or treatment follow-up (Kripalani et al., 2007).

A review of 94 studies of the transition of older adults from hospital to home documented between 1985 and 2001 demonstrated high rates of preventable poor post-discharge outcomes including functional deficits, cognitive impairment, emotional problems, development of multiple comorbid conditions, and poor general health patterns (Naylor et al., 2004). Another study revealed delays in medical diagnosis, poor provider and patient satisfaction, and higher rates of preventable return encounters (Australian Council for Safety and Quality in Health Care, 2005; Lardner, 1996; Lawrence et al., 2008; Naylor et al., 2004). Inadequate handoffs were implicated in up to 24% of malpractice claims in the emergency department (Cheung et al., 2010). In malpractice cases with communication breakdowns, 43% involved faulty handoffs. A review of 146 surgical errors found that 41 (28%) involved handoffs (Riesenberg et al., 2009b).

Despite the well-documented objectives for handoffs, there is little information on how to measure handoffs, thereby making it difficult to assess whether proposed handoff improvement recommendations are affecting quality and performance. Quality measures could be categorized into those that measure outcomes, content, and/or processes of handoffs (Cheung et al., 2010). The lack of measurement methods hinders economic evaluation of various handoff strategies on operational costs and also increases the complexity from a risk management perspective. The Agency for Healthcare Research and Quality created a care coordination atlas to support the field of care coordination measurement by developing a measurement framework along with a list of existing measures (AHRQ, 2010).
Significance of the Problem

Although the quality of care within individual settings has been subject to increased scrutiny, the quality of transitional care that patients receive as they move from one setting to another has received far less focused attention. Transitions of care occur when information or responsibility and accountability for care are transferred between two parties or is maintained by one party over time (AHRQ, 2010). A key component of transitions of care is the information transfer between providers across settings of care. Information transfer is essential when coordinating care and transitioning care across settings. Research shows that a paucity of information is exchanged between acute-to-home care settings (Anderson & Helms, 1993; Bowles et al., 2010; Satzinger, Wienecke, Wenng, & Herkert, 2005; Siegler et al., 2007).

According to the Healthcare Cost and Utilization Project, between 1997 and 2007, the number of discharges to home healthcare grew by 55% (up 1.3 million discharges) and the discharges to long-term care facilities increased by 32% (Steiner, Elixhauser, & Schnaier, 2002). The increasing number of patients moving from inpatient settings to home care point to the urgent need for standards and best practices for communication of information as patients’ transition from one setting to another across the continuum of care. To this extent, the Joint Commission now requires accredited facilities to “accurately and completely reconcile medications across the continuum of care.” (The Joint Commission, 2008d). The Society of Hospital Medicine recently published recommendations for the discharge of elderly patients. The Joint Society of Hospital Medicine–Society of General Internal Medicine Continuity of Care Task Force also recently published a systematic review with recommendations for improving the handoff
of patient information at discharge. Apart from these reports, however, it is uncommon to find evidence-based recommendations for hospital discharge applicable to a broad range of patients.

To improve information transfer from the hospital to another setting of care, attention must be paid to the content, format, and timely delivery of discharge information to the receiving care institution. This process requires the exchange of clinical information across separate care delivery settings, which frequently operate as independent silos. Frequently, practitioners in each setting function independently, without full knowledge of patient conditions and plan of care. This protocol places patients at risk for fragmented care, redundant or missed care, preventable errors, adverse outcomes, additional stress for the patient and caregivers, legal liabilities, and higher financial costs (Australian Council for Safety and Quality in Health Care, 2005; Lardner, 1996; Naylor et al., 2004; Solet et al., 2005). Studies show that, often, clinicians fail to have complete information with which to monitor the entire regimen adequately, much less to intervene to reduce discrepancies, duplications, or errors. However, few studies have fully described dimensions of roles and activities contained within the acute-to-home handoff; as well as the information exchanged, particularly information related to planning care, such as diagnoses, interventions, and expected outcomes. A search of the literature revealed that no studies analyzed the exchange of nursing care information between acute to home care or a comparison of the types of nursing diagnoses between acute and home care. This is critical given that patients are discharged from acute-to-home care for nursing care and the types of nursing phenomena for many patients do not change between acute and home care, particularly for patients with chronic conditions.
This study provides a richer understanding of the information, data, and knowledge shared in acute-to-home care handoffs and associated relationships to a patient-centered plan of care, which ultimately serves as the foundation for making recommendations for improvement. In addition, this study will characterize the activities that occur within acute-to-home care handoff communication space, setting a foundation for improvement in both process and technology. The study comprises seven research questions.

**Summary**

Acute-to-home care handoff is a core fundamental activity within care coordination and transitional care processes. The National Priorities Partnership, the Agency for Healthcare Research and Quality, and the Joint Commission on the Accreditation of Healthcare Organizations have recognized the importance of accurate patient information exchange to ensure care continuity and safety of the patient/client/resident. To this extent, the Department of Health and Human Services national initiative to improve care coordination, decision-making, and quality, through meaningful use of electronic health records (EHRs), has increased the need for better understanding of the role of the EHR in handoffs (Jha, 2010). Furthermore, NQF has endorsed preferred practices for the use of information technology and care coordination focused on the use of interoperable, standardized electronic information systems with functionalities essential to care coordination, decision support, quality measurement, and practice improvement (NQF, 2010). The preferred practices also recommend exchange of patient information among all providers and the promotion of regional health information exchanges to enable healthcare home teams’ access to information (NQF, 2010). Research is needed to increase understanding of the role dimensions, activities,
and data exchange requirements associated with acute-to-home care handoffs.
CHAPTER TWO
LITERATURE REVIEW

Literature regarding change of handoffs was identified and reviewed using electronic databases of published articles and information from organizations such as the Institute of Medicine, the Joint Commission, and the Agency for Healthcare Research and Quality (AHRQ). Search terms used for the review included: handoffs, handovers, shift report, sign-outs, sign-overs, transitions of care, transfers of care, patient transfers, discharge communication, discharge summaries, interdisciplinary transfers, MD-RN transfers, transitions from one setting of care to another, and home care communication. The literature review culminated in relevant articles from nursing, medicine, and non–healthcare disciplines, including case studies, literature reviews, qualitative inquiry, and quantitative research. The review will initially explore handoffs from an ethnographic perspective and then expand into handoff content, structure, and methods. There is a paucity of research analyzing handoffs from acute-to-home care. For this reason, the literature review includes research on all handoffs, independent of the healthcare setting.

Ethnographic Research

Ethnographic studies on nursing handoffs have focused on the values, beliefs, perceptions, and rituals of nurses as they engage in the process of handoffs, in order to refute, validate, or provide additional insight into previously held assumptions and beliefs.
These studies reveal a significant range of handoff ritualistic elements related to use of communication and documentation artifacts combined with face-to-face interpersonal interaction that enable nurses to obtain a sense of completion, thus building team morale and cohesion (Fenton, 2006; Parker, Gardner, & Wiltshire, 1992). The artifacts act as a resource for communication and coordination of care, thereby providing insight into treatment (Wilson, Galliers, & Fone, 2007). The incoming nurse typically assumes power of control in terms of understanding obligations and responsibilities (Ekman & Segesten, 1995; Wolf, 1989). Incoming nurses also show expectations for the types of information they expect to hear (Ekman & Segesten, 1995; Smith., Pope, Goodwin, & Mort, 2008). Research indicates that these customary norms, expected behaviors, and functions are necessary for the process of transferring accountability and responsibility for care (Ekman & Segesten, 1995). Nursing staff do not feel completely initiated until they directly observe and assess their patients (Ekman & Segesten, 1995). In addition, nursing handoffs fulfill staff needs such as social interaction, relationship building, peer validation on care provided, and updates on new policies and procedures (Ekman & Segesten, 1995; Fenton, 2006; Kerr, 2002). These findings were also found in a physician-led study in the emergency department that revealed an education and socialization function of handoffs (Lawrence et al., 2008). At the same time, researchers have demonstrated negative aspects of nursing handoffs, including power differential behavior, competition, criticism, defensiveness, and distracting conversations (Lally,
Manias & Street, 2000; Philpin, 2006; Strange, 1996; Yonge, 2008). For this reason, the ritualistic nature of nursing handoffs has received critique. However, most researchers cite ritualistic expressions as positive features of patient handoffs (Ekman & Segesten, 1995; Manias & Street, 2000; Strange, 1996; Yonge, 2008).

There is no research analyzing the social and cultural variables associated with nursing acute-to-home care handoffs. This raises questions regarding the impact that ritualistic expressions may or may not have during transitions of care.

Handoff Content

Clinicians in acute care settings are faced with large volumes of patient information that must be analyzed, summarized, and communicated during handoffs. The goal is to communicate this information within a reasonable timeframe, while making sure important information is not left out (Benson et al., 2006; The Joint Commission, 2009). Without the information communicated during handoffs, the ability to assess the patient and plan his or her care is severely compromised (Dowding, 2001). Therefore, when decisions are made to either include or exclude information, there are implications on patient outcomes (Dowding, 2001; Lamond, 2000).

There is little research on identifying information needs of inpatient nurses involved in handing off patient care. One study interviewed case managers to determine high priority information needs. The number one question was “What are the patient education resources?”, followed with “What are the patient data?” and “What are the referral resources related to the patient condition?” (Schnall, Cimino, Currie, & Bakken, 2011). In addition to the need for patient information, this study points to the potential need for patient education and referral information in the acute-to-home care nursing
An important aspect of structuring handoff content for semantic interoperability between systems hinges on the creation of a standard information model for the plan of care (diagnoses, interventions, expected outcomes). There is little research on the use of such models. More importantly, there are few standards on what the model should look like. Current efforts are underway within Health Level Seven International (HL7) to define a standard model for the plan of care (HL7, 2011b). In parallel, the United States Office of the National Coordinator (ONC) has spearheaded efforts to define content necessary for the plan of care, using care coordination use cases as the primary vehicle for content definition.

**Important Handoff Information**

According to the nursing literature, areas where there was high agreement about important handoff information to share include the following: patient name, demographics, and history of current illness; diagnostic results and level of consciousness; medical diagnosis and problems; mental comprehension; physician orders; plan of care, restrictions on care, and reason for admission or transfer; safety considerations; and vital signs, resuscitation status, allergies, and medications (Benson et al., 2007; Clemow, 2006b; Currie, 2002; Dowding, 2001; Kennedy, 1999; Mosher & Bontomasi, 1996; Patterson, 1995; Strople & Ottani, 2006). However, there is little in the literature about what content to include in the acute-to-home care handoff.

Studies comparing information deemed important for handover with information that is actually shared showed tremendous variation between studies. A few nursing studies have identified consistent communication of certain information, such as patients’
name, age, diagnostic findings, diagnosis, orders, and medical treatment; while other
studies demonstrated inconsistent and inadequate sharing of information (Benson et al.,
2006; Clemow, 2006a; Dowding, 2001).

Jordan (1991) found that 72% of the activities reported were insignificant,
whereas Dowding (2001) found that as much as 50% of information sharing in nursing
handoffs is unimportant. Furthermore, another study found that sharing unimportant,
extraneous, and subjective information diverted nurses and unnecessarily extended
nursing handoff time (Benson, et al., 2006). Some researchers found that much of the
information shared in handoffs was general, related to insignificant activities of the
previous shift, and lacked the granularity necessary for nursing intervention (Jordan,
1987; Sherlock, 1995; Williams, 1998). Most studies concur that handoffs frequently
contain unnecessary information and fail to include information about the
interdisciplinary plan of care, particularly domains related to nursing such as patient
mobility, continence, pressure ulcers, nutrition, hygiene, and education. Jordan (1991)
found that plans of care were reported in handoffs 12% of the time, whereas Kennedy
(1999) found that plans of care were reported only 1% of the time.

Studies analyzing handoffs from acute-to-home care find significant gaps in
information exchange. A study by Anderson and Helms (1993) showed that only one
half of the information needed for skilled nursing home care was communicated at
discharge and furthermore the content shared varied greatly by the type of home care
agency, as well as the method for exchange (phone, fax, electronic methods) (Anderson,
Helms, Black, & Myers, 2000). Similar to handoffs that occur within the same setting,
acute-to-home care handoff content is heavily focused on the exchange of medical
diagnoses, with almost no exchange of nursing and psychosocial information (Anderson et al., 2000). Furthermore, content shared during transitions to home care was better for home care agencies associated with hospital systems (Anderson et al., 2000). Studies show the increasing demands of documentation and the inability to retrieve information from computer systems as two major barriers to effective handoffs (Anderson et al., 2000).

In addition to the paucity of nursing-related information exchanged during acute-to-home care handoffs, studies show discrepancies between in-home nurse review and admission information received, related to medication data, allergies, and cognitive status for patients with impairment understanding disease and symptoms (Bowles et al., 2010). Frequently information gaps are compensated by home care nurse dependency on patient and family recall of hospital events (Bowles et al., 2010). This increases the risk for error in an environment where home care nurses have little access to hospital systems or staff for information validation. Another study found that home care nurses had as little as 7% of the patient information from the hospital. This resulted in poor home care because nurses could not execute on evidence-based guidelines without appropriate clinical information about the patient (Bowles et al., 2010).

A complicating factor in the transitions from acute to home is the fact that although home care nurses interact with primary care physicians, information about the acute care stay is stored in different home care and primary care electronic systems. This increases the room for error and hinders providers’ ability to find common ground in terms of patient plans of care.

The literature does show some trends towards a more prospective approach to
handoffs that allows time for discussion of patient goals and progress (Clemow, 2006a).

The movement from a retrospective to a more prospective framework helps to facilitate planning and identify priority areas that need attention (Alem et al., 2008). By including prospective content, the handoff is focused on expected outcomes can be implemented which can also be a source for recovery from failure (Alem et al., 2008; Dowding, 2001).

Two recent studies used a modified approach to standardization. One study suggests that it is important to modify handoff content in accordance with the patient’s unique profile (Lawrence et al., 2008). In another study, physicians were given the ability to extract important data elements from the electronic health record (EHR) into an electronic handoff tool, whereby they added a contingency plan that included anticipated problems along with an “if-then” note with recommendations and a to-do list for the incoming physician (Flanagan, Patterson, Frankel, & Doebbeling, 2009; Lawrence et al., 2008). A follow-up survey showed positive results.

These findings are similar to studies conducted in other high risk settings. In an analysis of handoffs in other high-consequence settings (aviation, nuclear power plants) handoffs included a contingency plan for potential future problems, allowing for interactive discussion between the incoming and outgoing parties (Flanagan et al., 2009). This approach was linked with better outcomes. These studies imply the need for customization of content in accordance with the patient profile, addition of information regarding potential problems, and the need for interactive dialogue regarding prospective planning. The following questions are raised: Is there information needed for handoffs that is not in the patient record? Are there new data elements that are generated as a byproduct of the interactive dialogue that occurs during the handoff process, and how
should these data be represented and integrated within the electronic patient record? Will standardization prevent providers from tailoring the plan of care around patient specific needs?

Research to date has not explored the facets of decision support surrounding what to share or not share in handoffs. Standardization of content may not solve this problem. Large volumes of patient information combined with handoff time constraints make identification of the right content to include in handoffs a difficult task. There is insufficient research defining the specific information that should be shared and rules for defining what to include or exclude from the report. This type of research is critical because, as certain types of information is missed, forgotten, or not communicated, patient care can be compromised (Strople, 2006).

**Information Source**

Two studies showed that information from the patient’s chart was rarely referenced at handover despite significant efforts to complete it, subsequently increasing risks related to undesirable outcomes (Clemow, 2006a; Fenton, 2006). The results of these studies agree with another study where nurses not only left information out of handoffs, but then substituted incorrect patient data for data not communicated by the prior shift (Pothier, Monteiro, Mooktiar, & Shaw, 2005). At the same time, one study found that 20–30% of information conveyed during handoffs is not documented in the medical record (Patterson & Wears, 2010). For home care nurses, who have little or no access to the acute care patient record, information gaps are filled with patient recall of the acute care experience (Anderson et al., 2000; Bowles et al., 2010). In a study by Bowles (2010), home care nurses had access to ejection fractures for heart failure patients
only 14% of the time and HbA1c for diabetic patients only 12% of the time.

**Standardization of Handoff Information**

**Industry Drivers**

The healthcare industry recommends standardization of handoff content to ensure that pertinent patient information is shared on a consistent basis. More recently, JCAHO (2009), Bates and Gawande (2003), Strople (2003), and Kaiser Permanente (2007) have all identified the importance of using structured content for handoff communication (Bates & Gawande, 2003; Strople & Ottani, 2006; The Joint Commission, 2009). To this extent, the Joint Commission has issued a new requirement in association with its National Patient Safety Goal 2, stating that facilities must implement standardized approaches to handoffs (The Joint Commission, 2008d). Pothier et al. (2005) recommend developing a standardized format so all parties have common expectations about what is going to be communicated. Kaiser Permanente (2007) is evaluating a standardized methodology for handoffs (Nurse Knowledge Exchange) that combines software templates with face-to-face interaction to convey information about the patient’s plan of care. Another study by Clemow (2006) instituted a standardized documentation tool and methodology that included communication at the patient’s bedside. The study revealed increased documentation quality, improvement in identification of problems, increased nurse satisfaction, and increased nurse patient contact time.

There are studies underway using clinical document architecture (CDA) standards to assess the impact of the continuity of care document (CCD) for acute-to-home care handoffs. The information standards and documents identify key information needed for exchange and methods for structuring the content thereby increasing electronic system
interoperability. CCD was created as part of a joint collaboration between HL7 and ASTM. CCD uses a set of templates which define how to use the data elements to communicate clinical data. The templates include a header, purpose, problems, procedures, family history, social history, payers, advance directives, alerts, medications, immunization, medical equipment, vital signs, functional status, results, encounters, and plan of care (HL7, 2011a). There is little research on the use of CCD. However, now that the CCD is a requirement for EHR certification, research efforts may increase.

Use of Mnemonics

The use of mnemonics for handoffs has increased between 2006 and 2008 with Situation, Background, Assessment, Recommendation (SBAR) being the most frequently cited in the literature (Riesenberg et al., 2009a). Between 2006 and 2008, 24 handoff mnemonics were found in 46 studies (Riesenberg et al., 2009a). The majority of the studies failed to use validated and reliable instruments and were based on small sample sizes (Riesenberg et al., 2009a).

Handoff Information Structure

A systematic method for deciding what information to include in handoffs, and how to structure the information for meaningful interpretation, is necessary for quality patient care. There is a connection between how handoff information is structured and sequenced and how information is processed and understood by the receiver (Benson et al., 2006; Clemow, 2006a; Lamond, 2000; Lardner, 1996; Strople, 2006; The Joint Commission, 2008d). Studies indicate that the use of a consistent logical structure for handoffs may simplify the process while also augmenting comprehension of the information being shared.
Because a handoff is such an information-intensive process conducted under time constraints, it is important to understand how humans organize and process information in memory (Dowding, 2001). Studies show that humans classify information into categories to make inferences (Dowding, 2001). Classifying information makes the information more meaningful and helps in understanding the causes of events, so inferences can be drawn about what events may occur in the future. When classifying information, similar things and related concepts are grouped together within a schema in memory, and humans look for similar groupings and schemas in the world. These theories behind the classification of information may provide insight into how to classify and structure information for use in handoffs.

The literature recommends creating structures for representing handoff information that mimic structures humans use to represent information in memory (schema consistent format) in order to facilitate decision-making and planning that occurs during handoffs. Dowding (2001) and Lamond (2000) analyzed the content of handoffs and identified a relationship between the order of data elements shared in handoffs and how information is processed and decisions are made, implying a connection between data element structure and sequence and nurses’ ability to plan care. They found that nurses who received handoffs in the format of a structured schema (that contains triggering cues) recalled information more accurately than those who received report using an inconsistent schema format. Therefore, the representation of handoff information in a structured schema may facilitate decision-making and planning for the upcoming shift.

There is a lack of research on what information is needed for handoffs, how the
information is processed and integrated within prior nursing knowledge, and the connection between handoff information and how decisions are made about patient care (Pope, Rodzen, & Spross, 2008; Wong, Yee, & Turner, 2008). Standardizing change of handoffs, before understanding how handoff information is represented, processed, and integrated within nursing practice, may result in undesirable results.

**Handoff Methods**

There are various methods for delivering handoffs, including face-to-face in a location away from the patient, face-to-face at the patient’s bedside, taped, and a combination of silent processing (computerized patient summary) and verbal exchange at the patient’s bedside (Clemow, 2006b; Lardner, 1996; Patterson & Wears, 2010). The literature reports advantages and disadvantages for all shift report methods, with a completely verbal shift report being the most likely to result in failed communication (Wong et al., 2008). In a study conducted by Lamond (2000), verbal communication of shift report resulted in 27% accuracy in recalling data elements shared. These findings were validated in another study by Pothier et al. (2005) and Fitzpatrick (2005), where shift report content was compared with medical record content to assess accuracy and completeness of data, using three different methods of shift report (verbal with no note taking, written with no standard form, and a preformatted sheet) (Fitzpatrick & Whall, 2005). The results showed the highest data loss with verbal report, while the lowest data loss was derived from use of a standardized preformatted sheet. These studies also showed that medical history and demographics are less likely to suffer from data loss. Nursing information is at the highest risk for data loss (Pothier et al., 2005).

In the industry, there is concern over traditional methods of inter-shift reporting,
which encompass verbal exchange in a separate location from the patient. This method relies heavily on human memory, is time-consuming, takes nurses away from the patient, and contains a considerable amount of unnecessary information. It has been suggested that verbal report should be conducted at the patient bedside (Anderson et al., 2000; McKenna & Walsh, 1997; McMahon, 1990). Anderson and Mangino (2006) conducted a study analyzing shift report at the bedside and reported financial savings as well as increased patient, staff, and physician satisfaction. The bedside report included safety checks and collaboration with the patient on setting daily goals. The benefits of conducting shift report at the bedside have been documented in other studies as well (Haig, Sutton, & Whittington, 2006; Kaiser Permanente, 2007; Strople, 2006).

The industry favors bedside shift report because it involves the patient in the plan of care, prevents including nonessential information in the report, and reduces time away from the patient. The literature recommends the following guidelines:

- Conduct the handover face-to-face (Lardner, 1996);
- Institute two-way handover, with both participants taking responsibility (The Joint Commission, 2009);
- Give as much time as necessary to ensure accurate communications (Benson et al., 2006; Haig et al., 2006; Lardner, 1996); and
- Incorporate a predetermined analysis of the information needs of the oncoming staff as the foundation for shift report (Benson et al., 2006; Lardner, 1996).
There is tremendous variation in handoff studies in terms of approaches, targeted populations, sample sizes, and theoretical underpinnings in both the nursing and medical literature (Riesenberg et al., 2009b). Frequently, survey tools were used without supporting validity or reliability evidence. Predominantly, researchers failed to use theoretical contexts of inquiry, provided no research question, and failed to define major concepts used in the study. In addition, failure to use theoretical underpinnings for research further diminishes the rigor of the research (Morse, 2003). Furthermore, provision of inconsistent information related to study design (sample size, population, and analysis of results) and methods (no testing of internal/external validity or reliability) undermines the rigor of research in the literature. Increased qualitative research to explicate the themes and corresponding definitions may help to create handoff frameworks and middle-range theory, which could set the foundation for quantitative research. The majority of articles are case studies that introduce handoff changes and measure the impact using surveys. These studies fail to use guidelines such as the Standards for Quality Improvement Reporting Excellence (SQUIRE) (IHI, 2010). There is a paucity of evidence to support the recommended strategies for handoffs proposed in the literature (Riesenberg et al., 2009b). There is a need for rigorous outcome studies designed to: (1) assess the effectiveness of handoffs; (2) determine the elements of handoffs that lead to improved patient outcomes; and (3) identify the best implementation strategies for handoffs that lead to improved patient outcomes (Riesenberg et al., 2009b).

The variation in study design and gaps in information provided hindered cross-comparisons between studies, thereby impeding efforts to summarize the state of the
science on this topic. This result leads one to believe that there is no concentrated and consistent ongoing research to advance the science of nursing as it pertains to handoffs. In fact, handoff studies in the nursing literature have not received adequate attention in the past 10 years (Staggers & Jennings, 2009). During this same time period, development, adoption, and use of the EHR by nurses has increased, without requirements input from the scientific community. Use of the EHR has been advocated as a tool to support handoffs, but there are only two studies in the literature assessing the impact of the EHR on care (Lawrence et al., 2008; Staggers & Jennings, 2009; Strople & Ottani, 2006). One physician-led study discovered benefits of technology use during handoffs in the emergency department (Lawrence et al., 2008), and a nurse-led study revealed little use of technology by nurses during handoffs in a medical surgical unit (Staggers, Weir, & Phansalkar, 2008). Without rigorous scientific research analyzing the content necessary for handoffs, and more importantly the decision support logic and knowledge structures underlying this content, the EHR will continue to evolve without the potential for improving the efficiency, effectiveness, and quality of handoffs.

**Theory: Distributed Cognition Across Patterns of Knowledge**

Translation of theories from other fields can be useful in facilitating understanding of patient handoffs. There are three major theories relevant to patient handoffs. One theory is the *Phenix’s theory on patterns of knowledge and meaning* (Phenix, 1964). Handoff knowledge has both a pattern and meaning that is transformed and propagated through the healthcare system. The second theory is *distributed cognition theory* (Liu, Nersessian, & Stasko, 2008). This theory provides a framework depicting the coordination of artifacts between individuals and the environment (Liu et al., 2008).
Distributed cognition theory is equally applicable to handoffs because handoffs involve interaction between individuals and/or groups. The third theory is *clinical communication space theory* (Coiera, 2000). This theory provides a framework to help match the use of communication and information technologies to the task at hand.

**Phenix Patterns of Knowing**

Phenix (1964) proposed an elaborate theory on the logical patterns of knowledge and meaning that could be used by all disciplines for general education. The central idea is that knowledge in the disciplines has patterns or structures and that an understanding of these structures is essential for teaching. An essential component of Phenix’s patterns of meaning focuses on the integration and interrelationships of knowledge sources to form a cohesive and comprehensive whole (Phenix, 1964). This is equally important in nursing because the process of handoffs involves integrating multiple sources of data into a meaningful description of the patient, providing information necessary for planning care for the upcoming shift.

Phenix’s (1964) main line of argument states that general education is the process of engendering essential meanings through the structure of knowledge. This is equally applicable to nursing, where handoffs involve the engendering of the essential meaning of the patient story through the structure of knowledge shared in the process. According to Phenix (1964), every cognitive meaning has two logical aspects—specifically quantity (range of things known) and quality (the relationship between things known and the knower). There are three categories of quantity: singular (one thing), general (many things), and comprehensive (totality of knowledge that results in comprehensive meaning) (Phenix, 1964). Additionally, qualities of meaning are characterized as fact
(what actually exists), form (imagined possibilities), and norm (what ought to be) (Phenix, 1964). Coupling the three quantity aspects with the three quality aspects, in all combinations, results in nine generic classes of meaning as follows:

1. Singular fact: This class includes meanings that arise out of concrete existence in direct personal encounters, which are typically reflected in things that are designed to portray the uniquely personal dimensions of existence, such as philosophy, religion, and psychology (Phenix, 1964).

2. Singular form: Meanings are perceived in imagination, without reference to fact, basic to the various arts, and are designated as esthetics (Phenix, 1964).

3. Singular norm: This class encompasses moral obligations within a given situation where one seeks knowledge of what he or she really ought to do (Phenix, 1964).

4. General fact: The expression of knowledge in empirical sciences, laws, and theories of the actual world as studied in the natural sciences is included in this class (Phenix, 1964).

5. General form: This class includes the disciplines that are concerned with expression of meaning, such as language, math, gestures, rituals, and other nondiscursive symbolic conventions (Phenix, 1964).

6. General norm: Generalizations concerning moral conduct and principles associated with the discipline of ethics is included in this class (Phenix, 1964).

7. Comprehensive fact: This class comprises the study of actuality from a comprehensive standpoint, including both the singularity of the unique event and the relationships of that event with other events, as portrayed in the discipline of history (Phenix, 1964). The historian integrates symbolic, empirical, esthetic, and
ethical meanings into a synoptic perspective of what happened in the past (Phenix, 1964).

8. Comprehensive norm: This class includes the kinds of knowledge controlled by a normative quality such as religion (Phenix, 1964).

9. Comprehensive form: The intent of this class focuses on knowledge intended to interpret meanings in any discipline through use of widely generalizable forms as conveyed through the discipline of philosophy (Phenix, 1964).

Knowledge is defined as the acquaintance with facts, or principles, as from study or investigation of an area (Phenix, 1964). Meaning is the understanding that comes from the structure of knowledge and its expression, which comes in multiple forms (language, gestures, and rituals) (Phenix, 1964). Meaning has four dimensions. The first dimension is experience through our consciousness. The second dimension stems from rules and logic. The third dimension speaks to the multiple varieties of meaning that can be derived from knowledge. The fourth dimension involves the communication of meaning through symbols (Phenix, 1964).

Application of Phenix’s Theory to Handoffs

The concepts of Phenix’s (1964) nine classes of meaning can be used as a meaningful analogy for redefining new concepts related to the categorization of knowledge shared during handoffs. The nine classes bear analogy to nursing and provide a rich conceptual perspective for concept derivation, whereby the conceptual definitions of Phenix can be transposed to nursing and redefined through innovative ways of looking at the knowledge shared during handoffs. The nine classes of meaning can be applied to nursing knowledge shared during handoffs and may be consolidated into four categories
of knowledge. These categories are analogous to Phenix’s patterns of meaning but have been transposed with new labels and redefined in ways that are relevant to nursing practice. The four categories of knowledge are empirical knowledge, personal knowledge, nondiscursive knowledge, and integrated knowledge.

The first category of knowledge is empirical knowledge of the sciences, which refers to the expression of the kind of knowledge that is contained within the sciences. This form of knowledge includes information related to biology, physiology, psychology, sociology, physics, earth science, pathophysiology, medicine, nursing, and the other disciplines. This type of knowledge takes the form of demographic information, assessment findings, orders, problems, diagnoses, diagnostic test results, and the interdisciplinary plan of care. The knowledge shared in this realm pertains to empirical data about the patient that is supported by science and the nursing discipline. The definition for this type of knowledge originated from Phenix’s general fact knowledge.

The second category of knowledge shared during handoffs is personal knowledge, which is related to the personal dimension of existence between the patient encounter and their state of health or illness. This takes the form of expression through values, morals, and impressions. Personal knowledge shared during handoffs is manifested in patient preferences or decisions as it relates to treatment, such as the desire to stop chemotherapy or expressed interest in discussing the ethical implications of choosing one method of treatment over another as it relates to the patient’s personal beliefs or intuition about events. There are many examples of this type of knowledge that are shared during handoffs, and many times, the knowledge may or may not be supported by empirical fact, but is very important in terms of planning care for the patient. This type of personal
knowledge is respected and taken into consideration as nursing care is provided. The definition originates from Phenix’s (1964) description of the dimensions of personal existence, which is often operationalized in religion, individual psychology, esthetics, and existential philosophy.

The third category of knowledge is nondiscursive knowledge, which encompasses the various patterns of expression of meaning through symbolic forms, such as language, gestures, and rituals. This type of knowledge takes the form of overt behavior related to body movement that is intended to express an idea. This could manifest itself in patient behaviors such as pushing a food tray away abruptly, requesting quiet time before a meal, or preferring sleep medication at a specific time because it matches what the patient does at home. This form of knowledge can also manifest itself in complacent behavior whereby the patient is moving in accord with the care delivery process. This form of knowledge contains degrees that range from low (complacent) to high (extreme ritualistic behavior). This knowledge originates from Phenix’s (1964) general form of knowledge that includes formal patterns for expression of meaning using nondiscursive symbolic conventions and constitutes the realm of symbolics.

The fourth type of knowledge shared during handoffs is integrated knowledge, which involves the synthesis of empirical, personal, and nondiscursive knowledge into a comprehensive description of the patient’s past and present, as well as predictions about the future. Specific events are threaded together with other events, and relationships between events are communicated so the receiving nurse can construct an integrated form of knowledge using all of the patient information presented. This form of knowledge takes empirical, personal, and nondiscursive knowledge and integrates it into a story
about the patient, including the past, present, and plans for the future. This form of knowledge originates from Phenix’s (1964) comprehensive fact and norm knowledge.

Theoretical Propositions

The knowledge communicated in handoffs follows a logical structure with defined categories of information that must be shared to deliver patient-centered care reflective of the nursing practice. Empirical, personal, nondiscursive, and integrated knowledge are all essential elements that must be communicated in handoffs to adequately develop a quality plan for the upcoming shift.

Empirical, personal, and nondiscursive knowledge collectively add to integrated knowledge, as shown in Figure 1. Integrated knowledge informs all components of the plan of care.

Figure 1. The structure of knowledge contained within handoffs

![Structure of Knowledge Shared in Handoffs](image)

The patient plan of care and the response to the plan of care provide feedback to the four categories of knowledge and are therefore reflected in the sources of knowledge.
There is an interrelationship between the sources of knowledge, since one influences the other. For example, a patient with critical empirical data such as a high level of anxiety and depression may display higher levels of nondiscursive behavior evidenced through body gestures and rituals. For this reason, all four sources of knowledge are critical to the creation of a patient-centered plan of care. For this reason, the use of a consistent logical structure for handoffs will augment the development of a holistic quality patient-centered plan of care reflective of nursing practice.

**Distributed Cognition Theory**

Distributed cognition is a theoretical framework developed in the 1980s by Edwin Hutchins (Liu et al., 2008). The premise of this theory is based on the fact that artifacts/tools amplify cognitive thought processes in the brain (Liu et al., 2008). Information in the brain is represented as symbols within a hierarchical structure that forms the foundation for thinking and decision-making. Traditional approaches to cognition have focused on understanding the “individual” aspect of thinking first; and then once an understanding of the individual aspect of thinking is achieved, one can better understand the dynamics that occur when the individual interacts within the environment (Liu et al., 2008). Approaches to handoffs have taken this reductionist technique by focusing first on how a single individual (outgoing nurse) obtains, processes, and stores clinical information necessary for handoffs and then connects this to the interaction with another individual (incoming nurse). This implies a linear process whereby artifacts are used to connect individual entities.

Distributed cognition theory challenges this approach to cognitive thought processes. Hutchins (1980) warns that we must differentiate the process of manipulating
artifacts (such as using clinical summary reports for handoffs) from the cognitive process that occurs within the individual mind during decision-making when using artifacts. 

Handoff studies to date (Alem et al., 2008; Anderson & Mangino, 2006; Benson, et al., 2006; Caruso, 2007; Kerr, 2002; Lardner, 1996; Manning, 2006; Riesenberge et al., 2009a; Strople, 2006) have focused on the use of tools and not so much on the decision-making that occurs when one processes the content contained within the tool; and, more importantly, when one shares the content with another during handoffs. Distributed cognition focuses on the coordination between individuals, artifacts, and the environment whereby information is embedded within interactions between parties. Through coordination among agents, and through interaction between agents, additional knowledge is gathered that contributes to a cognitive ecosystem that is larger than the sum of its parts (Liu et al., 2008). Cognition is shaped by the transduction (decision-making between/across individuals) of information (patient information) across modalities (systems, people, or electronic databases) moving towards a cognitive goal (safe transitions of care). This representation can be used to provide insight into handoffs.

Distributed cognition theory emphasizes that cognition is distributed or stretched across humans and artifacts (Liu et al., 2008). Cognitive processes are distributed, dynamic, and capable of generating new knowledge. Cognitive processes can occur between individuals or across systems involving coordination between structures (material or environmental) or be distributed through the use of information generated from prior interactive events. From this perspective, handoffs are an evolving property of interactions between individuals (or systems) through action and perception rather than a property bounded inside an individual (Liu, et al., 2008). This result implies that handoff
coordination of care is not an *a priori* schema but something that emerges through the actions and decision-making of both the outgoing and incoming parties involved in handoffs.

**Clinical Communication Space Theory**

The clinical communication space theory proposes that information sharing is an interactive process whereby information is shared between parties along a continuum of less structured communication (telephone conversation) to more structured communication (computer use) (Coiera, 2000). What makes the clinical communication space challenging from an informatics perspective is the fact that the clinical communication space extends beyond computational processing of acquiring and displaying data (Coiera, 2000). Many times, voice-to-voice conversations are needed to share information so both parties can ask questions and/or interpret contextual clues. This iterative process of questioning and reading contextual clues facilitates the process of finding common ground. Common ground refers to the knowledge shared between two communicating agents (Coiera, 2000). The common ground process typically involves sharing of ‘content’ and then a subsequent process to ensure the content has been received and is understood. When two parties do not share common ground, then communication is ineffective.

Information technologies require explicit formalization of the information while communication technologies require less formalized structured content (Coiera, 2000). An understanding of the specific task at hand provides insight into where along the continuum highly structured (computer) or informal solutions (phone) are more effective. Coiera (2000) developed a set of principles to guide the design of systems along different
points of the continuum. When there is a low degree of common ground between parties, less structured conversations are needed to share information. However, when there is a high degree of common ground between parties, more formalized structured communication is effective (Coiera, 2000).

Kuziemsky and Varpio (2010) similarly found that finding common ground is critical for certain care delivery processes, such as discharging a patient from acute care and coordinating the plan of care post-discharge. When different terminology is used within the communication channel, miscommunication occurs and no common ground is achieved (Kuziemsky & Varpio, 2010). Shared knowledge or common ground regarding the patient plan of care between acute and home care is essential for quality care. Use of comprehensive consistent structured terminology between the inpatient documentation, referral to home care documentation, and the initial home care visit is critical for establishing common ground.

Because acute-to-home care handoffs involve different parties in different geographical settings, there is an increased reliance on information technologies. Information shared during handoffs from acute-to-home care needs to be modeled ahead of time for computational communication between nurses on the inpatient side and nurses in home care. This information exchange is worth formalizing to define common ground. Achieving common ground can be enhanced through sharing of inpatient data using predefined structures that work for both inpatient and home care, yet are extensible enough for adaptation to meet the unique needs of the home care environment.

Integrated Theoretical Framework

Both the Institute of Medicine and the Joint Commission emphasize the
connection between accurate and effective communication among caregivers and quality patient outcomes. These organizations recommend best practices for clinical team communication, including standardization of handoff methods. Best practice definition for handoffs should use middle range theory as the underpinnings of nursing research and practice. The integrated theoretical framework used in this research is abstract enough to extend across many settings but close enough to empirical measurement to support the generation and testing of questions used in this study.

The integrated theoretical framework as depicted in Figure 2 illustrates the connection between theories used in this study and the study purpose. This integrated theoretical framework is used to explain how data and information get distributed among caregivers to support transitions of care. The framework renders a depiction of concepts and artifacts that are important to the handoff process. The framework shows how distributed cognition theory, patterns of knowledge theory, and clinical communication space theory interact to support the research purpose. Essentially, the three theories, in parallel, represent key aspects of acute-to-home care handoffs. The clinical communication space is the channel within which distributed cognition and patterns of knowledge occur and materialize within the handoff process. Through the communication channels, patterns of knowledge are distributed across cognitive efforts of nurses involved in handoffs. Central to distributed cognition is the concept of the activity system. For purposes of this research, the activity system is the handoff process. It includes the nurses (agents) and handoff tools (electronic and manual documentation, etc.), as well as handoff methods (phone, fax, etc.). Clinical communication space represents the continuum of communication methods (electronic, face-to-face, fax, etc.)
within which nurses find common ground (shared knowledge between two parties).

Within the clinical communication space channel, data and knowledge are communicated between nurses in an iterative process until common ground is achieved.

**Figure 2. Kennedy integrated theoretical framework**

The overall purpose of this research study is to explore and analyze patient handoffs by nurses from acute-to-home care settings. The study objectives are as to: 1) Describe acute-to-home care patient handoff distributed cognition and patterns of communication related to Roles, tasks, and activities within the handoff process; Data and knowledge shared; and Communication channels used; 2) Describe how the International Classification of Nursing Practice (ICNP) represents communication of nursing diagnoses and goals as patients transition from acute-to-home care settings; 3) Test the National Quality Forum’s (NQF’s) Quality Data Model (QDM) ability to support acute-to-home care handoff data.

**Research Direction**

As the review of the literature indicates, there are many unanswered questions related to acute-to-home care handoffs. What are the role dimensions of nurses in the handoff process? What data is shared and, more importantly, what data is needed for an effective acute-to-home care handoff? Research is needed to fully describe and represent the acute-to-home care handoff processes.
This study used an integrated theoretical framework encompassing cognition theory, patterns of knowledge theory, and clinical communication space theory, which in parallel, represent key aspects of acute-to-home care handoffs. The clinical communication space is the channel within which distributed cognition and patterns of knowledge occur and materialize within the handoff process.

The study design focused on the use of researcher observation of nurse activities related to information retrieval and documentation (manual and electronic documentation). During the observation process, nurses were interviewed to obtain a greater understanding of activities and information required for each phase of the acute-to-home care handoff process. Subsequently, patient data contained within manual and electronic documentation was gathered for purposes of obtaining an understanding of the types of information shared and/or needed for acute-to-home care handoffs.

The overall purpose of this research study was to explore and analyze patient handoffs by nurses from acute-to-home care settings. The study objectives were to describe acute-to-home care patient handoff distributed cognition and patterns of communication related to: role dimensions, tasks, and activities within the handoff process; data, information and knowledge shared; and communication channels used. In addition, the study described how the International Classification of Nursing Practice (ICNP) and the Quality Data Model (QDM) represent communication of nursing diagnoses and goals as patients’ transition from acute-to-home care settings.
Research Questions

1. What are the nursing role dimensions and affiliated activities associated with acute-to-home care handoffs?

2. What are nurses’ patterns of communication when working jointly with other nurses during acute-to-home care handoffs?

3. What are the artifacts used during acute-to-home care handoffs?

4. What communication channels do nurses use during acute-to-home care handoffs?

5. What are the types of data and knowledge shared between nurses during acute-to-home care handoffs?

6. What are differences between plan of care data on day of discharge, shared during the acute-to-home care handoff, and initial home visit?

7. How do ICNP and QDM support data and information shared during acute-to-home care handoffs?
CHAPTER THREE
METHODS

Purpose

The overall purpose of this research study was to explore and analyze patient handoffs by nurses from acute-to-home care settings. The study objectives were to:

1. Describe acute-to-home care patient handoff distributed cognition and patterns of communication related to:
   a. Role dimensions, tasks, and activities within the handoff process;
   b. Data, information and knowledge shared; and
   c. Communication channels used.

2. Describe how the International Classification of Nursing Practice (ICNP) represents nursing diagnoses and goals as patients transition from acute-to-home care settings.

3. Test the National Quality Forum’s (NQFs) Quality Data Model (QDM) ability to support acute-to-home care handoffs data and information.

Data were collected and analyzed during all steps of the acute-to-home care handoff process as follows:

1. Hospital employed RN case manager tasks and activities, and data and information retrieval from documentation associated with discharge coordination in preparation for handoff;
2. Hospital employed RN case manager handoff to the home care network; and

3. The home care nurse tasks and activities, and data and information retrieval from documentation associated with the initial home care visit.

Theory, Research Aims, and Research Questions

Theories, research aims and research questions used in the study are in Table 1.

Table 1. Theories, research aims, and research questions

<table>
<thead>
<tr>
<th>Theory</th>
<th>Research Aims</th>
<th>Research Questions</th>
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<tr>
<td>Distributed Cognition Theory</td>
<td>1. To observe distributed cognition, patterns of communication and common ground between nurses during acute-to-home care handoffs.</td>
<td>1. What are the nursing role dimensions and affiliated activities associated with acute-to-home care handoffs?</td>
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<td></td>
<td>2. To describe activities and artifacts used during each step in acute-to-home care handoff.</td>
<td>2. What are nurses’ patterns of communication when working jointly with other nurses during acute-to-home care handoffs?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. What are the artifacts used during acute-to-home care handoffs?</td>
</tr>
<tr>
<td>Patterns of Knowledge Theory</td>
<td>1. To describe the types of data and knowledge shared during each step in the acute-to-home care handoff.</td>
<td>1. What are the types of data and knowledge shared between nurses during acute-to-home care handoffs?</td>
</tr>
<tr>
<td></td>
<td>2. To describe the ability of ICNP and QDM to represent data shared in acute-to-home care handoffs.</td>
<td>2. How do ICNP and QDM support data and information shared during acute-to-home case handoffs?</td>
</tr>
</tbody>
</table>
Theory Research Aims Research Questions

Clinical Communication Space Theory To describe the communication channels used during each step in the handoff process.

1. What communication channels do nurses use during acute-to-home care handoffs?
2. What are differences between plan of care data on day of discharge, shared during the acute-to-home care handoff, and initial home visit?

Conceptual and Operational Definitions

Conceptual and operational definitions used in this study are presented in Table 2.

Table 2. Conceptual and operational definitions

<table>
<thead>
<tr>
<th>Concept</th>
<th>Conceptual Definition</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agents</td>
<td>A person or an electronic system responsible for a particular action within systematic teamwork efforts (Salmon, Stanton, Walker, &amp; Jenkins, 2005).</td>
<td>Nurses or electronic systems responsible for and involved in handoffs within the activity system</td>
</tr>
<tr>
<td>Cognition</td>
<td>The mental act or process by which knowledge is acquired, including perception, intuition, and reasoning (Collins English Dictionary, 2010).</td>
<td>Data, information and knowledge shared between agents (person or electronic system) during the acute-to-home care handoff process.</td>
</tr>
<tr>
<td>Cognitive Tasks</td>
<td>The mental act or process by which knowledge is acquired, including perception, intuition, and reasoning required during a task.</td>
<td>Nurse identification of priority information needed for handoffs – and rationale for why the information is important.</td>
</tr>
<tr>
<td>Command</td>
<td>The person who has control over the situation (Salmon et al., 2005).</td>
<td>The nurse who has been assigned to handoff the patient from acute care and the nurse assigned to receive the patient in home care.</td>
</tr>
<tr>
<td>Concept</td>
<td>Conceptual Definition</td>
<td>Operational Definition</td>
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</tr>
<tr>
<td>Communication</td>
<td>The imparting or interchange of thoughts, opinions, or information by speech, writing, or signs (Random House Dictionary, 2010).</td>
<td>The exchange of verbal, written, or electronic patient information between nurses responsible for the patient, from acute care to home care.</td>
</tr>
<tr>
<td>Communication Information Continuum</td>
<td>A model or framework that aims to understand the specific task characteristics that are used to identify which form of communication (communication channel) is most appropriate for the task at hand (Coiera, 2000).</td>
<td>A list of the entire communication space tools (forms, checklists, etc.) and methods used (phone, fax, and computers).</td>
</tr>
<tr>
<td>Data</td>
<td>Discrete terminology elements (codes) shared during handoffs (diagnoses, goals, observations, medications, etc.).</td>
<td>Discrete terminology elements (codes) shared during handoffs (diagnoses, orders, goals, etc.).</td>
</tr>
<tr>
<td>Distributed Cognition</td>
<td>To place data or knowledge on objects, individuals, and tools in our environment and subsequently share (distribute) through interaction between agents (Liu et al., 2008).</td>
<td>The data, information, and knowledge shared and acted upon through written, verbal, or electronic communication between nurses during the acute-to-home care handoff.</td>
</tr>
<tr>
<td>Distributed Collaboration</td>
<td>To work jointly with others or together especially in an intellectual endeavor (Random House Dictionary, 2010).</td>
<td>Nursing working with all members of the clinical team to complete an acute-to-home care handoff as measured by measured by two-way interactions with other team members.</td>
</tr>
<tr>
<td>International Council of Nursing (ICNP)</td>
<td>A unified nursing language system. It is a compositional terminology for nursing practice that facilitates the development of and the cross-mapping among local terms and existing terminologies (ICNP, 2010).</td>
<td>A compositional terminology for nursing practice that facilitates the development of and the cross-mapping among local terms and existing terminologies.</td>
</tr>
<tr>
<td>Concept</td>
<td>Conceptual Definition</td>
<td>Operational Definition</td>
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<td>-------------------------</td>
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</tr>
<tr>
<td>Knowledge</td>
<td>Acquaintance with facts, truths, or principles, as from study or investigation; general erudition (Random House Dictionary, 2010).</td>
<td>Facts regarding best practices or evidenced-based care shared during handoffs.</td>
</tr>
<tr>
<td>Knowledge Objects</td>
<td>The specific description of the data or knowledge source (Walker et al., 2006).</td>
<td>The specific description of the data source such as history and physical, pressure ulcer protocol, etc., or the knowledge source such as institutional protocols.</td>
</tr>
<tr>
<td>Nursing Diagnosis</td>
<td>A clinical judgment about individual, family, or community experiences and responses to actual or potential health problems and life processes (NANDA, 2009).</td>
<td>Patient symptoms, problems, diagnosis in response to actual or potential health and life processes.</td>
</tr>
<tr>
<td>Nursing Goal</td>
<td>Defined target or measure to be achieved in the process of patient care. A typical goal is expressed as an observation scheduled for a time in the future with a particular value (HL7, 2011b).</td>
<td>Defined target or measure to be achieved in the process of patient care. A typical goal is expressed as an observation scheduled for a time in the future with a particular value.</td>
</tr>
</tbody>
</table>

Variables, Operational Definitions, and Measurement Methods

The variables, operational definitions, and measurement methods are defined in Table 3.

Table 3. Variables, operational definitions, and measurement methods

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definitions</th>
<th>Measurement Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handoff Activity System</td>
<td>The activity system includes the nurses involved in acute-to-home care handoffs; the environment (hospital, home care agency and home); tools used (such as phone, patient</td>
<td>• Observation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Interviews</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hierarchical Task Analysis depicted in Visio Diagrams</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Propositional Networks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Communications usage</td>
</tr>
<tr>
<td>Variable</td>
<td>Operational Definitions</td>
<td>Measurement Methods</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>record, etc.); and data and knowledge contained documented and shared during acute-to-home care handoffs. The sharing of information is distributed cognition.</td>
<td>diagram</td>
<td></td>
</tr>
<tr>
<td>Communication Patterns</td>
<td>Clinicians' perceptions and observed actions during the acute-to-home care handoffs.</td>
<td>• Observation and interviews of RNs involved in acute-to-home care handoffs</td>
</tr>
<tr>
<td>Adequacy of ICNP and QDM</td>
<td>The percentage of complete mappings of acute-to-home care handoff data to ICNP and QDM.</td>
<td>• Observations of two-way communication instances</td>
</tr>
<tr>
<td>Handoff Communication Channels</td>
<td>The means or tools used to communicate handoff data and knowledge (face-to-face, phone, handwritten, computer generated forms, fax, etc.).</td>
<td>Observation instances of communication channels</td>
</tr>
<tr>
<td>Communication Handoff Concordance</td>
<td>Degree of match between handoff data and data documented within the manual and electronic documentation systems.</td>
<td>Comparison of data elements actually shared during the handoff process with data elements that are important for the handoff process.</td>
</tr>
</tbody>
</table>

**Research Assumptions**

This study has ten main research assumptions:

1. By studying nurses in their normal work environment, it is assumed that their behavior is not impacted by outside direct observation;
2. It is assumed that nurses can verbalize their work processes, information seeking behavior, and decision-making;

3. The data and information collected as described within this report captures the essence of the handoff process;

4. Nurses involved in this study are reflective of other nurses and are therefore similar;

5. The handoff process includes multiple activities and steps related to the gathering of information and subsequent decision-making using data and information gathered;

6. The handoff process can be improved through the use of information technology containing formalized terminology structures;

7. The qualitative data collected (observations and nurse interviews) captured most aspects of the acute-to-home care handoff process;

8. Nurses interviewed are more similar than different to other nurses in who are in similar roles;

9. The researcher of this study was able to capture all the activities and data associated with acute-to-home care handoffs and that the activities observed and patient data and information exchanged reflect typical acute-to-home care handoffs; and

10. The process of transitioning patients from acute care to home care meets the definition of a handoff because there is an exchange of patient data and information, as well as a transfer of accountability and responsibility for patient care, from the acute to the home care environment. Inherent within this
assumption is that the patient and/or significant other assumes a role in this transfer by assuming some level of accountability and responsibility for care. This is aligned with the Hospital Consumer Assessment of Healthcare Providers and Systems Survey (HCAHPS), which asks patients whether they received information in writing about what symptoms or health problems to look out for after they leave the hospital (HHS, 2010). HCAHPS, developed by the Centers for Medicare & Medicaid Services and the Agency for Healthcare Research and Quality, is a standardized survey and data collection methodology for measuring patients' perceptions of hospital care (HHS, 2010).

**Study Design**

This is an exploratory descriptive study design to describe acute-to-home care handoffs. The purpose of this exploratory descriptive study was to fully describe and represent the acute-to-home care handoff processes and corresponding data, information, and knowledge shared, as the processes naturally unfold. The study focused on the use of observation techniques, data visualization within flowcharts using the Event Analysis of Systematic Teamwork (EAST) methodology for representation of data gathered from observation, interviews, and patient documentation sources (Stanton, Salmon, Walker, Baber, & Jenkins, 2005). Concurrently during the observation process, nurses were interviewed to obtain a greater understanding of activities and information required for each phase of the acute-to-home care handoff process. Subsequently, patient data contained within manual and electronic documentation was gathered to obtain an understanding of the types of data shared and needed for acute-to-home care handoffs.

The study design focused on the use of non-participant researcher observation of
nurse activities related to information retrieval and documentation (manual and electronic documentation). A qualitative research design was chosen to obtain a deep understanding of acute-to-home care handoffs through investigation of information rich handoff cases. The intent was not to achieve generalization of findings to populations. In adherence with the principles of qualitative study design, no computations or power analysis could be completed to determine *a priori* minimum sampling numbers (Sandelowski, 1995). However, the sample size was determined when data saturation was achieved as evidenced by redundancy in data, information, activities, and communication patterns during acute-to-home care handoffs. The sample size allowed for deep analysis of inquiry and resulted in a new understanding of the acute-to-home care handoff process (Sandelowski, 1995).

**Methods**

**Introduction**

From a distributed cognition perspective, handoffs can be viewed as the planning, coordinating, and controlling of information and tasks across individuals to transfer responsibility of care. The acute-to-home care handoff process requires computation that is distributed across individuals between the acute care and home care setting.

The science of distributed cognition refers to the language of representational states that transcend the boundaries of any one individual (Walker et al., 2010). Within handoffs, there are representational states that involve interactions between people and artifacts, as well as the resulting states and state changes (as nurses interact with data either on documentation forms or in electronic systems). During the handoff process, computation (processing of patient data and information) and representational states
(moving data from one phase of care delivery to another or moving data to another caregiver) occur. Data are moved from one agent (person or electronic system) to another agent during multiple phases that complete the handoff process. With the advent of technology, some representational states are promulgated without overt communication such as when a discharge order enters the database and the discharge process is automatically initiated through electronic transfer of data. Explication of the computation (information exchange and processing) and representational states (movement of data from agent to agent) is necessary for understanding the acute-to-home care handoff process.

Industries outside of healthcare use multi-method techniques to analyze information used in computation and to describe various representational states within a process. Air traffic control and nuclear power plant handoffs serve as two examples (Patterson, Roth, Woods, Chow, & Gomes, 2004). According to the literature, the analysis of data and processes relies on ethnography to understand how data and information are used, represented, and integrated within the physical and social world (Walker et al., 2010). However, according to Walker (2009), the problems with ethnography are as follows:

- Ethnography output is at a qualitative and highly discursive level, which impedes full understanding necessary for the application of technological innovation;
- It is not always possible for the observer to become embedded within the environment under study; and
- Ethnography approaches are not always repeatable and this hinders reliability.
Other industries that have similar characteristics related to handoff processes used the Event Analysis for Systematic Teamwork (EAST) method (Salmon et al., 2005) as a way to capture the computation and representational states within processes (Walker et al., 2010). The EAST methodology embraces activities of ethnography and in addition complements ethnographic approaches with techniques for visualizing tasks/activities, decisions, and artifacts that help to analyze the phenomena of interest. For this reason, an approach that includes the EAST methodology was used for this research because:

- The study of handoffs requires a multifaceted, multidimensional approach because there are overlapping concepts/variables that take on different perspectives depending on which agents (human and electronic system) are in the scenario, when tasks occur, where agents are located, what information is available and used, and what knowledge is shared between agents;

- The EAST method is based on the integration of several individual methods, which is reflective of the multi-faceted nature of acute-to-home care handoffs;

- The EAST method is a descriptive method. It facilitates understanding of what is currently happening at a level of granularity necessary for analysis and understanding; and

- The EAST methodology provides tools that allow one to characterize cognition (knowledge) within context (tasks/activities that utilize the knowledge). This is based on the theory that cognition is part of activities, rather than an object preceding or following tasks/activities (Hollnagel, 2002).

The EAST method has been used in other areas of research related to team
communication, handoffs, and distributed cognition (Salmon et al., 2005; Stanton et al., 2005; Walker et al., 2006; Walker et al., 2010; Walker et al., 2009).

Background

The EAST is a technique used to analyze team based, collaborative activities related to communication, control, command, computers, and intelligence (C4i) (Stanton et al., 2005). C4i is the infrastructure needed for the execution of common goals supported by agents spanning different locations and technology. Communication, control, command, computers, and intelligence include people, teams, information, technology, and knowledge. The EAST methodology can be used in any domain that utilizes the C4i infrastructure during task performance. The patient handoff process incorporates communication (sharing of patient information between nurses), control (handoff of control from one nurse to another), command (one individual is usually in command during the handoff), computers (use of the electronic systems), and intelligence (sharing of data, information, and knowledge from one party to another).

The EAST method has been applied to many different scenarios, such as handoffs in air traffic control, switching in railways, and alarm handling in nuclear power facilities (Walker et al, 2010). The goal of the EAST methodology is to provide information that can be used to develop generic models of C4i activity and to improve systems designed for enhancing communication, control, command, computers and intelligence (Walker, et al., 2009).

The EAST methodology is focused on:

Agents

- Identification of the person or electronic system participating in the scenario;
• When tasks are performed and which agents are associated with their performance;
• Where agents are physically located and how agents interoperate; and

Data and Information

• How agents collaborate, interoperate, and communicate to achieve scenario aims;
• What tasks agents are performing, and the data and information used and shared between agents.

Study Site

The study site was a large teaching hospital, which is part of an enterprise system in Philadelphia, PA. The hospital provides a full range of inpatient services and is associated with a home healthcare service agency that is also owned by the enterprise.

Sample

The sample included registered nurses (RNs) involved in handoffs between acute-to-home care settings. This involved RNs in the role of case managers in the hospital, intake coordinators in the home care agency, and home care nurses. The nurses were observed while conducting handoffs with the permission of management at both the acute care and home care facilities. Nurses involved in the handoff of medical and surgical cardiac patients from acute-to-home care settings were invited to participate in the study. Permission of the nurses and institutional review board (IRB) approval from the healthcare delivery organization and Loyola University were obtained. The researcher’s Collaborative Institutional Training Initiative (CITI) certification remained current throughout the entire study.
The exclusion criteria were non-nursing individuals present or involved with handoff activities and handoffs of non-medical patients. Participants were asked to complete a consent form prior to data collection. At any time, participants were able to remove themselves from the study and all information related to their participation was deleted. The sample size was large enough to ensure that informational redundancy or theoretical saturation was achieved. Data was collected until no new information was obtained.

**Data Collection**

Data collection followed medical and surgical cardiac patients through the entire handoff process (first, the enterprise hospital nurse tasks and activities associated with discharge coordination in preparation for handoff; second, the home care case manager handoff to the home care intake coordinator; and third, the home care nurse information processing of the handoff information and activities prior to and during the home care visit). Data were collected until data saturation was achieved, when no additional information surfaced.

Data collection sources included the following four areas:

1. Observation of nurse activities during the acute-to-home care handoff;
2. Interviews of nurses involved in acute-to-home care handoffs;
3. Collection of patient data contained within manual and electronic documentation sources; and
4. Communication methods (phone, face-to-face, electronic) used during the acute-to-home care handoff process.
Observation of Nurse Activities

Observation of case managers, intake coordinators, and home care nurses was conducted. The researcher observed activities associated with acute-to-home care handoffs related to information retrieval and information documentation. The observations included all nurses responsible for acute-to-home care handoffs.

For each scenario, the researcher observed and recorded:

- All normal work handoff activities, activity purpose, activity descriptions, activity sequence, as well as agents involved (human, computer and/or written);
- Data and information documented and communicated (electronic systems, documentation forms, and verbal communication);
- Knowledge used from evidenced-based protocols, policies, and/or procedures;
- Communication method(s) (face-to-face, phone, computer); and
- Other information identified by the nurse as being relevant to the handoff process.

Nurse Interviews

Interviews were conducted with nurses involved in acute-to-home care handoffs to clarify handoff activities, sequencing of activities, and information reviewed and needed to complete the handoff process. The researcher asked clarifying questions in order to explicate both the steps contained within the handoff process and the information used during the handoff process. This involved dividing the scenario activity into phases and then interviewing the agents associated with each phase using pre-defined probes to
obtain information on decision-making and rationales for actions. The interview probes for the hospital nurses involved in acute-to-home care handoffs included:

1. What is your role in the acute-to-home care handoff process?
2. What tasks and activities do you carry out during this process?
3. Is there a specific sequence to the tasks you perform?
4. What data and information do you need to perform the handoff activity?
5. Where do you get the data and knowledge?
6. What data do you document during this process and where do you document (manual form, automated system)?
7. How do you communicate data and information to the home care nurse during this process?

Interviews were conducted with nurses only. Both the interviews and observations were conducted concurrently in order to obtain a greater understanding of activities and information required for each phase of the acute-to-home care handoff process. The interviews included the enterprise hospital nurses involved in discharging patients to home care and the home care nurses. The interviews also included the intake coordinators and home care nurses of the home care network. The interviews were conducted in the enterprise hospital as well as the home care network. The interviews were transcribed by the researcher, and verified with research subjects for accuracy. All researcher field notes of handoff activity were transcribed verbatim into a Microsoft® Word file. The field notes were validated by each subject who participated in the study. In addition, patient data and knowledge shared between the case managers, intake
coordinators, and home care nurses were gathered and recorded in either a Microsoft®
Word and/or Excel® file.

Collection of Patient Data

The researcher gathered patient data from both manual and electronic patient record sources from the following three sources:

1. Acute-to-home care handoff artifacts and data contained within the artifacts;

2. Data in the patient record (both manual and automated) on the day of discharge that was not used in the handoff but important information for the home care nurse to be aware of. For instance, if the nursing discharge summary data were not used for the acute-to-home care handoff but contained important information related to the patient’s transition to home care, these data elements were collected as well; and

3. Patient data gathered during the initial home visit (diagnoses, interventions, goals, findings).

The researcher documented manual flowsheets and electronic template names (e.g., problem list, history and physical, discharge report), as well as the data values contained within each flowsheet or electronic template, including the following categories: diagnosis, interventions/orders, expected outcomes, observations and findings, and demographics (age and gender).

Data Analysis

Patient Documentation Data

Structured data analysis used the data extracted in the data collection phase and
modeled it into deeper structures for purposes of calling out concepts in patient documentation sources as described within the theoretical framework. The acute-to-home care handoff and patient record data were systematically analyzed through a process of data reduction, where the text was classified into a few categories representative of the content. The categories included diagnoses, orders/interventions, goals (expected outcomes), observations and findings. The data were then mapped to the National Quality Forum (NQF) Quality Data Model (QDM) and the International Classification of Nursing Practice (ICNP).

QDM. The QDM is an information model that describes clinical concepts in a standardized format so individuals can communicate information consistently (NQF, 2009). The QDM contains standardized data elements that reflect data necessary for performance and quality measurement (NQF, 2009). The purpose of the QDM is to enable performance measurement as a byproduct of point of care electronic documentation. For this reason, the QDM provides a standardized set of data that need to be captured within the EHR. The QDM provides the data element (e.g., medication) along with its context of use (e.g., ordered, administered). All the data elements in the QDM come from industry standard definitions. The QDM has been integrated into Health Level Seven (HL7) standards for reporting, as well as the Healthcare Information Technology Standards Panel (HITSP) efforts on interoperability. The QDM was developed through a national consensus process whereby healthcare and consumer stakeholders provided input. The QDM provides a useful framework for analyzing handoff content and for comparing handoff content to the content contained within the EHR.
QDM Mapping Methodology

Source terms were mapped against QDM concepts and attributes using the following 3 point scale:

1. Exact semantic match
2. Partial semantic match: source terminology data is more granular (subordinate) or less granular (superordinate).
3. No match

International Classification of Nursing Practice (ICNP). Nursing diagnoses, interventions, and goals were manually extracted from the acute-to-home care handoff artifacts and the patient record. The International Standards Organization (ISO) model 18104 for nursing diagnosis was used to identify diagnoses and goals (ISO, 1994). The nursing diagnoses and goals were mapped against the International Classification of Nursing Practice (ICNP) Version 3. Concepts were reduced to the smallest level of granularity without losing semantic meaning. Synonyms were grouped together. A random number generator was used to select 5% of the total terms for diagnoses, goals, interventions, and findings. Primitive concepts were coded and ranked using a methodology approved by ICNP:

- Precoordinated expressions that semantically matched the source terms were searched within ICNP;
- If there was no semantic match, then searches for primitive concepts to create a post coordinated expression was conducted; and
- The following 3 point scale was used:
1. Exact semantic match

2. Partial semantic match: source terminology data is more granular (subordinate) or less granular (superordinate).

3. No match

Two raters independently coded the diagnoses and goals. Discrepancies were discussed until consensus or use of a third party to achieve consensus was achieved.

Data Comparison

An analysis of handoff data shared and patient record documentation was performed to assess commonality concordance between data shared in the actual handoff; data in the patient record deemed as important for handoff; and data documented during the initial home care visit. The data were coded using ICNP and the QDM.

The following procedures were followed to ensure confidentiality of patient data

1. The minimum amount of unique patient identifying data needed to track the patient from acute-to-home care was collected. This included patient name, date of birth and account number. A coding system was used for the patient name so all data could not be traced back to any specific patient;

2. The patient name, birth date, and account number was collected solely for purposes of being able to identify the patient during the data collection phase. Once it was confirmed that all handoff information was obtained, the patient name, birth date, and account number were deleted;

3. Unique patient identifying information such as address, insurance coverage, insurance number, medical record number, episode of care number, social
4. The list of identifiers (name, birth date, and account number) were kept in a separate location from the coded subject data that could be linked to patient identifiers;

5. A numeric coding system was used to track the nurses as well as the patients. No nurse or patient names were retained;

6. All information was stored in a password-protected enterprise hospital laptop computer. The only person with access to the password protected computer was the principal investigator. The laptop was always with the principal investigator or within a locked file cabinet in a locked room to which only the principal investigator had access;

7. Disk encryption software was used to safeguard the contents of the laptop;

and

8. The only person with access to the password-protected computer was the principal investigator.

Hierarchical tasks analysis (HTA). A hierarchical tasks analysis (HTA) was developed showing all information within a flowchart depiction. As depicted in the theoretical framework, distributed cognition calls for a description of the activity system and a type of analysis as defined within the HTA. This involves a description of the scenario under analysis using a hierarchy of goals, sub-goals, and operations related to achieving the goals. The goals as defined by the organization were used for the study.
Clear definitions of tasks and activities involved, people and systems involved, and task/activity constraints for the goals and sub-goals were developed. The HTA took the form of a flowchart, hierarchical lists, and narrative descriptions. The initial HTA was compared to the actual activity that occurred to identify discrepancies between what the nurses claimed the process to entail and the actual activity that occurred.

Communications usage diagram (CUD). A communications usage diagram (CUD) was developed to represent communication between the agents involved in the scenario, and also to analyze the communication technology used (Table 6). This technique has been used in telemedicine and is useful for any domain that involves distributed collaboration between parties in different locations. The CUD uses both the handoff observation and audio transcript as input. Actors and the type of communication used within each task, along with sequencing of the tasks, were documented. The frequency of communication by each agent and by the communication medium used was calculated. This technique has been used in telemedicine and is useful for any domain that involves distributed collaboration between parties in different locations. The communication usage diagram is an effective tool for analyzing the effects of the communication medium used and the preferred communication medium by party type and communication medium used. The template in Table 4 will be used for the CUD:

Table 4. Communications usage diagram

<table>
<thead>
<tr>
<th>Time</th>
<th>Parties involved in the task</th>
<th>Communication Medium Used</th>
<th>Effects of Communication Medium Used</th>
<th>Recommended / preferred communication medium</th>
</tr>
</thead>
</table>

(Walker et al., 2006)
Exclusions

Any handoff that does not include an RN was excluded from this research. In addition, handoffs of non-cardiac patients were excluded.

Ethical Considerations

The application of ethical integrity in nursing research and knowledge development assure that the following will be addressed in this study:

1. Before beginning data collection, IRB approval was obtained from Loyola University Chicago and from the care delivery organization’s Institute for Medical Research;
2. The study had sound scientific design and validity and addressed problems germane to healthcare and society in general;
3. All participants were treated with respect and all communication with the researcher was held confidential. Trust was established by formally communicating that judgments regarding practice will not be made;
4. At any time, participants could withdraw from the study and all information will be deleted;
5. Study participants should incur no harm from participating and all participants had access to methods which allowed for communication of study issues, questions, or concerns to management at any time during the study;
6. All data were stored in a password-protected computer and/or double-locked file cabinets. Only the researcher had access to stored information;
7. A process was defined and followed if disturbing data were discovered. This included anything that threatened the safety and well-being of the care delivery
setting or any participant involved in the study. The process was defined with the care delivery organization based on their protocols for safety.
CHAPTER FOUR

RESULTS

Data were collected related to nursing care for nine patients from the study hospital’s cardiovascular eighty-three bed unit over a four week period. The cardiovascular unit provides care for medical and surgical cardiac patients. The study sample included five surgical patients, of whom there were three coronary artery bypass surgery patients, one heart transplant patient, and one cardiac valve replacement patient. There were four medical cardiac patients, including one patient with congestive heart failure, one patient with aortic stenosis, and two patients with coronary artery disease. Two patients were observed because they were scheduled to receive home care. However, during the course of their inpatient stay, the inter-professional team decided to send the patients to a skilled nursing facility, after input from the family. These two patients were not included in the study.

Data collection methods included observation of activities, nurse interviews, and patient chart abstraction by the researcher. Data saturation was achieved after the first five patients, evidenced by redundancy in both handoff activities and data shared, as well as sustained consistency in nursing role dimensions and responsibilities. The results will be explored in accordance with the research questions as follows:

Research Questions

1. What are the nursing role dimensions and affiliated activities associated with
acute-to-home care handoffs?

2. What are nurses’ patterns of communication when working jointly with other nurses during acute-to-home care handoffs?

3. What are the artifacts used during acute-to-home care handoffs?

4. What communication channels do nurses use during acute-to-home care handoffs?

5. What are the types of data and knowledge shared between nurses during acute-to-home care handoffs?

6. What are differences between plan of care data shared during the acute-to-home care handoff and plan of care data in the acute and home care patient record?

7. How do ICNP and QDM support data and information shared during acute-to-home case handoffs?

**Research Question One**

What are the nursing role dimensions and affiliated activities associated with acute-to-home care handoffs?

Information describing the role dimensions and affiliated activities of nurses in handoffs was gathered through nurse observations and interviews. The acute-to-home care handoff of cardiac patients involves four individual roles:

1. The hospital case manager (HCM);

2. The home care case manager (HCCM);

3. The home care intake coordinator (IC); and

4. The home care nurse.

Both the hospital case manager and the home care case manager are onsite at the hospital.
Hospital Case Manager Role (HCM). The HCM is responsible for identifying the most appropriate level of post-discharge care. The HCM collaborates with physical therapy, occupational therapy, and the physician(s) to determine post-discharge placement. During the daily case management rounds, the hospital case manager explores and suggests cost effective options to the inter-professional team, while making sure quality is not compromised. The HCM is also responsible for soliciting patient preferences and for educating the patient on various discharge placement options.

Home Care Case Manager Role (HCCM). The HCCM is employed by the home care agency and is on-site at the hospital. The home care case manager is solely responsible for cardiac patients. The role of the HCCM is to coordinate a timely, efficient, and safe patient transition from the hospital to the Home Care Network. The HCCM validates the patient’s preference for the Home Care Network, confirms that the Home Care Network has a contract with the patient’s insurance company for coverage, refers the patient to the home care agency, and completes acute-to-home care handoff documentation.

Two HCCMs were interviewed (see Appendix A). In response to the interview question, “What is your role in the acute-to-home care handoff process?”, the HCCM’s responses were:

1. HCCM one: “My role as home care case manager is to coordinate an efficient and safe patient transition from the hospital to the Home Care Network. If I get insurance coverage and complete all the paperwork, then I’m successful.”

2. HCCM two: “My role as home care case manager is to facilitate a smooth transition to the home care setting.”
In response to the interview question, “What is your goal and how do you know if you were successful?”, the HCCM’s responses were:

1. HCCM one: “My goal is to obtain a complete list of medical diagnoses to ensure insurance coverage. So my goal is to get insurance reimbursement so the home care nurse can take care of the patient.”

2. HCCM two: “My goal is to make sure the patient has insurance coverage, that all equipment arrives; and if they need blood work, to make sure there is a way to get the blood drawn (either lab or the home care nurse). I also want to make sure they have insurance coverage for special meds (like lovonoxy).”

The above descriptions of the HCCM’s role were consistent with researcher observations.

Home Care Intake Coordinator (IC). The Home Care Network Intake Unit receives the referral from the home care case manager and assumes a role in validating the number of insurance-approved home visits and in assigning a home care nurse to the patient. The home care intake coordinator also triages the patient to determine if the initial home care visit date is urgent (such as next day because the patient requires blood work or home infusion).

Home Care Nurse. The home care nurse’s role is to review the referral information in preparation for the initial home care visit and to assess when the patient should be seen, based on the referral with input from the patient. If the IC determines the visit is urgent (such as next day because the patient requires blood work or home infusion), the home care nurse accepts the IC’s assessment and recommendation.
Nursing Activities Affiliated with Acute-to-Home Care Handoffs

There are many activities associated with acute-to-home care handoffs that start with the inpatient admission and conclude with the initial home visit. Observation of handoff activities revealed no definitive or overtly stated process. The process starts on the inpatient admission day, involves multiple parties, and is continuous throughout the inpatient stay. Based on researcher observation, with input from the home care case manager (HCCM), the handoff activities were divided into five steps:

1. Identification of patient discharge needs (hospital case manager HCM);
2. Home care case manager (HCCM) handoff preparation;
3. Home care case manager (HCCM) handoff to home care intake coordinator (IC) and home care nurse;
4. Discharge to home; and
5. Initial home visit.

Acute-to-Home Care Handoff High Level Process

The acute-to-home care nursing handoff process starts on the inpatient admission and concludes when the home care nurse conducts the first home care visit. On admission, every patient is evaluated by a hospital case manager (HCM) to determine the most appropriate level of care post-discharge. The goal is to ensure each patient is discharged to an appropriate level of care based on patient preferences, individual care needs, and insurance eligibility. There are five major steps within the acute-to-home care handoff process (see Figure 3). The acute-to-home care handoff process, as depicted in Figure 3, was consistently followed for all nine patients. On admission, the post-discharge needs of each patient are evaluated (step one). If the patient requires home care,
then a referral is made to the home care case manager (HCCM) and the HCCM engages in handoff preparation (step two). This is followed with the HCCM handoff to the home care intake coordinator (IC) (step three). The patient is discharged (step four). The acute-to-home care handoff concludes with the initial home visit (step five).
Each of the major steps in the handoff process was further refined and explicated through observation and nurse interviews.

**Step 1. Identification of Patient Post-discharge Needs (Hospital Case Manager)**

The processes associated with the identification of the patient’s post-discharge needs are explicated in Figure 4.
Figure 4. Identification of patient post-discharge needs

**Identification of Patient Post Discharge Needs**

- **Patient Admitted**
  - Hospital Case Manager (HCM)
    - Reviews Chart
    - Meets with Patient/Family
  - Primary Care Nurse
    - Initiates Inter-professional Plan of Care
    - Adds Discharge Planning as a Focus Area
    - Initiates Discharge Education

- **Inter-professional Team (PT, OT, HCM, MD*)**
  - Led by HCM
  - Conducts Daily Case Management Rounds
  - Reviews Patient Progress
  - Discusses Post Discharge Needs and Discharge Date
  - Decides that Patient Needs Home Care Services

- **Hospital Case Manager (HCM)**
  - Confirms Patient Preference for the Home Care Network
  - Confirms Insurance and Prescription Coverage
  - Documents above in the Patient’s Chart and the Case Management System

- **Hospital Case Manager (HCM)**
  - Refers Patient to the Home Care Case Manager (HCCM)

* Physical Therapist (PT), Occupational Therapist (OT)
The hospital case manager (HCM) visits every patient on the inpatient unit of study. Patient education starts on admission if the HCM thinks the patient requires post-hospitalization follow-up care. The HCM is responsible for educating the patient and/or significant other on services available to the patient for post-acute care.

Upon admission, each patient is reviewed every morning during the interprofessional case management rounds which include the cardiologist, physical therapist, occupational therapist, and the HCM. The primary nurse responsible for the patient is not involved during the daily case management rounds. During these rounds, the status of each patient is reviewed and discussed. The information shared between the team members includes medical diagnoses, problems, abnormal results, independence with activities of daily living, mobility, cognitive functioning, anticipated discharge date and location, and patient preferences for post-discharge care. Every patient on the cardiovascular unit is discussed during the daily rounds.

In addition to the daily case management rounds, there are weekly case management rounds to discuss complex cases. Complex cases are identified by length of stay parameters predefined for the specific diagnosis. These rounds are held between the HCM and the physician assistant responsible for the patient. During these sessions, patient observations and findings are shared and discussed to identify a reasonable discharge date and a plan of action to achieve the discharge date. Information shared between the HCM and the physician assistant are handwritten notes on computer generated census reports. The primary nurse responsible for the patient is not included in the weekly case management rounds.
The HCM reviews the recommendations of the team with the patient and/or significant other for input and agreement on the discharge location. Discharge location options include transition to home without home care, home care, skilled nursing care, or rehabilitation facility. If the team decides that home care services are needed, the hospital case manager meets with the patient to: discuss home care; confirm insurance and prescription coverage; document patient request for Home Care Network; and complete a referral to the home care case manager (HCCM).

Once the discharge date has been defined and agreed upon by the interprofessional team (cardiologists, hospital case manager, physical therapist, and the occupational therapist), the HCM produces two documents (artifacts). First, the HCM writes a progress note in the patient chart documenting the patient’s need for and preference for the Home Care Network (network under study). Second, the HCM enters a referral into the electronic case management system. This referral appears on the electronic worklist of the home-care case manager (HCCM) who is also on-site at the hospital. The primary care nurse is consulted by the HCM or the HCCM on an ad hoc basis if there are questions. During the study period, the primary nurse responsible for the patient was consulted one time when the HCCM was concerned about a patient’s ability to administer insulin independently at home. There are no formal processes for information exchange between the HCM and HCCM or for information exchange between both case managers and the primary nurse responsible for the patient (either the inpatient nurse or the home care nurse).
While the HCM is evaluating the patient’s post-discharge needs, the primary nurse responsible for the patient is initiating an individualized inter-professional plan of care. Discharge planning and discharge education are included on every patient’s plan of care. The focus areas and patient problems on the plan of care are reviewed, prioritized and updated on a daily basis by the primary inpatient nurse caring for the patient. Physical therapy, occupational therapy, and social services also provide input into the inter-professional plan of care. Physicians do not document on the inter-professional plan of care. They document notes on the order entry form in the chart.

Step 2. Home Care Case Manager (HCCM) Handoff to Home Care (Preparation)

The HCCM handoff preparation activities are depicted in Figure 5. Once the patient is referred to the HCCM, the HCCM confirms that the Home Care Network has a contract with the patient’s insurance company and reviews the hospital case manager (HCM) documentation to confirm that the patient wants the Home Care Network. In addition, the HCCM validates the patient’s decision is to engage the Home Care Network during a face-to-face meeting with the patient and/or significant other(s). Then the HCCM reviews the patient chart to assess appropriateness for home care, past medical history, patient needs at discharge, and confirms that the patient lives in the home care agency’s network service area. During the face-to-face patient encounter, the HCCM confirms the patient’s address, living arrangement, and levels of stories in the home. The HCCM educates the patient and/or significant others on the services provided by the home care agency and assesses potential needs that were not included in the original referral. During this encounter, the HCCM confirms that the patient has transportation home.
Every patient receives a pamphlet with the following information:

- A definition of what home healthcare is;
- When services begin;
- The home care team members;
- Who is eligible for home health aide service;
- General information about insurance coverage;
- Types of home care services provided;
- The name of the home care case manager and contact information; and
- Contact information for the home care agency.

The HCCM completes the Referral Intake Form which is submitted to the home care agency intake unit. The HCCM enters information into two systems, the patient record (manual documentation) and the home care electronic system. The HCCM retrieves patient information from the inpatient chart, enters patient information into the case management system, and the home care system to initiate and complete the referral to home care process. The HCCM manually documents information from the patient record onto the Home Care Referral Intake Form (see Appendix B). This is the only information that home care nurse (HCN) receives from the hospital, prior to the initial home care visit regarding the patient. This information serves as the formal handoff document from the hospital case manager (HCN) to the home care nurse. The staff nurse is not directly involved in these processes. The staff nurse interacts with the HCN or the HCCN when the latter parties approach the staff nurse for input. This typically occurs when information about the patient is needed or when the physical therapy recommendation for post-discharge placement is questioned.
Figure 5. Home care case manager handoff to home care preparation

**Home Care Case Manager (HCCM)**

- Confirms that the Home Care Network has a contract with the patient’s insurance company
- Reviews the hospital case manager note stating the patient desires the Home Care Network
- Reviews the patient chart to assess appropriateness for home care
- Documents information needed for the referral while reviewing the patient chart to assess appropriateness for home care
- Confirms that the patient lives in the home care agency’s network service area

**HCCM Face to Face Meeting with Patient and or Significant Other**

- Validates the patient’s decision to use the Home Care Network
- Confirms patient address, living arrangement, and levels of stories in home
- Educates the patient and or significant others on home care services provided
- Assesses potential needs that were not included in the original referral
- Documents a note in the patient chart summarizing the above activities/outcomes

**HCCM**

Enters referral information gathered from the above processes into the electronic home care system

**Patient RN**

Documents progress against the plan of care
Educates Patient

**HCCM**

**Inpatient EHR**

Manual and Electronic

**Home Care EHR**

**Step 3. Home Care Case Manager (HCCM) Handoff to the Home Care Agency (Intake Coordinator and the Home Care Nurse)**

The HCCM handoff to the home care agency activities are depicted in Figure 6.

Once the HCCM enters the referral information into the home care electronic system, the nurse in the central access department of the home care agency works with utilization
review to confirm insurance coverage and the number of approved patient visits. The intake coordinator (IC) in the central access department also identifies the specific nurse who will be assigned to the patient. The home care nurse, once assigned, retrieves the referral information from the electronic home care system, reviews the referral information, and subsequently schedules the home care visit. The visit is scheduled when notification of patient discharge is received by the home care agency.

Figure 6. Home care case manager handoff to home care

**Home Care Case Manager (HCCM) Handoff To Home Care**

(Intake Coordinator and Home Care Nurse)

- **HCCM**
  - Enters referral information manually written down (from the chart) into the electronic home care system

- **Home Care Agency - Intake Coordinator (IC)**
  - Negotiates number of home care visits with the insurance agency
  - Assigns the patient to a home care nurse

- **Home Care Nurse**
  - Receives referral from the electronic system
  - Reviews referral in the electronic home care system
  - Schedules home care visit (based on input from the IC)

Step 4. Discharge to Home Care

While the home care agency is confirming insurance and assigning the home care nurse to the care, there are parallel activities occurring in the hospital, as depicted in
Figure 7. The primary physician generates the Discharge Instructions Report and reviews it with the patient. The HCCM meets with the patient to confirm that the patient has the Discharge Instructions Report and all prescriptions. The Discharge Instructions Report defines medications into four categories: (1) medications to continue (based on preadmission medications); (2) medications that are new; (3) medications to stop taking; and (4) medications with new dosages. If the HCCM is concerned about any aspect of patient understanding of post-discharge self-care, they will ask the nurse who is responsible for the patient. However, this is not typical protocol. During the study period, the HCCM only interacted with the staff nurse once to confirm patient understanding of insulin administration. Concurrently during this time, the nurse responsible for the patient provides discharge education to the patient and/or significant others and completes a discharge summary. The physician completes a medical discharge summary for each patient. These latter two activities occur independently.

On the day of discharge, the staff nurse reviews the physician generated discharge instructions with the patient. For one of the patients in the study, the HCCM met with the patient on the day of discharge to confirm that the patient was ready for discharge, had transportation home, and all necessary discharge instructions and prescriptions. The HCCM said they meet with complex patients when there are concerns about transportation and patient ability to perform self-care.

The primary nurse responsible for the patient provides discharge education on self-care activities required at home and also completes the patient discharge summary on the day of discharge. For all nine study patients, the discharge summary was completed after the patient left the hospital.
Figure 7. Discharge to home

Step 5. Initial Home Visit

The acute-to-home care handoff concludes with the initial home visit as depicted in Figure 8. The home care nurse receives the patient referral information from the electronic home care system, prior to visiting the patient. This is the only document
transmitted to the home care nurse. All information exchange between the home care case manager (HCCM) and the home care nurse is electronic. The home care nurse does not interact with the HCCM. The handoff between the HCCM and the home care nurse is electronic.

The acute-to-home care handoff is completed during the initial home care visit, when the home care nurse receives a hard copy of the patient Discharge Instructions Report (from the patient). The home care nurse requests this hard copy report from the patient. The Discharge Instructions Report is written in language for the patient, not the home care nurse. However, it has become one of the acute-to-home care handoff documents. The home care nurses rely on the medications, physician contact information, and follow-up appointments that are in the report. Also, the home care nurses use the self-care instructions on the Discharge Instructions Report as a tool to initiate teaching. The Discharge Instructions Report contains the following information:

- Medical record and account number;
- Date of birth;
- Admission and discharge date;
- Diagnosis;
- Procedures;
- Problem list (medical diagnoses);
- Appointments for the patient to make with physicians and time window for when the appointment should be made;
- Orders for diagnostic tests, locations, and phone numbers;
- Test results along with an interpretation of the results in laymen’s
language;

- Medication name, dose, comments, and reason for the medication;
- Medications are characterized as new medications, prior medications and adjustments in dose, and discontinued medications;
- Vaccinations administered during the inpatient stay and rationale for the vaccination;
- Narcotic side effects if the patient is on a narcotic;
- Patient instructions for caring for themselves at home (activity level, treatments, wound care, and nutrition);
- Weight, height, and BMI, along with education on weight monitoring and instructions on how to weigh oneself;
- Education on smoking cessation along with contact information for the smoking cessation program; and
- Contact information for the physician and instructions to call with any questions or concerns about post-discharge care.

The above described processes were observed and were consistent with all nurse interviews (see Appendix D). As stated during the interviews, the home care nurses retrieve handoff information from two main sources: The Referral Intake Form from the electronic home care system and the Discharge Instructions Report, which the nurses obtain from the patient during the initial home care visit. The nurses also reported getting information from the “patient’s own story.” One nurse reported that most of the information comes from the patient verbal explanation of current and past conditions. All nurses referenced the need to know all the patient problems prior to the initial home care
visit, particularly independence with activities of daily living, problems of other family members, and environmental problems. Independence with activities of daily living is assessed and documented on the nursing discharge summary. However, the home care nurses do not have access to the nursing discharge summary. All nurses reported that currently they are not receiving the full problem list.

Figure 8. Initial home visit

Initial Home Visit

Home Care Nurse
- Receives patient referral information
- Reviews patient information

Home care nurse schedules visit with the patient

Discharge Instructions Report – Paper Copy
- Concludes Acute-to-Home Care Handoff

Note: The Home Care RN does not have access to the RN or MD Discharge Summary completed on the day of discharge

Research Question Two

What are nurses’ patterns of communication when working jointly with other nurses during acute-to-home care handoffs?

Patterns of Communication

A hierarchical tasks analysis (HTA) was developed showing all information
within a flowchart depiction as represented in Table 5. HTAs involve a description of the scenario under analysis using a hierarchy of goals, sub-goals, and operations related to achieving the goals (Walker et al., 2010). Clear definitions of tasks and activities involved, people and systems involved, and task/activity constraints for the goals and sub-goals were developed. As depicted by the HTA and the communication usage diagram (CUD) (see Appendix E), handoff communication between case managers and the home care nurses follows a structured pattern, along a continuum from less structured communication to more structured communication. The inter-professional daily case management rounds and the face-to-face meeting with the patient are less structured. The exchange is verbal and two-way allowing for interactive dialogue. However, the verbal exchange during the daily case management rounds follows a fairly consistent pattern as each team member provides the same information (patient initials and room number, medical diagnoses, progress to date, abnormal diagnostic results, expected discharge date, and discharge location). After the case management rounds, the remaining handoff process steps are more structured, guided by the restrictions of data elements contained within manual forms and electronic templates. Even the steps outside of the manual forms and electronic templates, such as progress notes and patient interactions, follow the same pattern evidenced by consistent data elements and information exchange.

The communication pattern is predictable, consistent, linear, and sequential. Data are sent from one party to the next party who is responsible for taking action. The data are distributed across responsible parties following a one-way model. There are few opportunities to ask questions to the party sending the data and for this reason it is difficult to find common ground between parties. The person sending the data has no way
of knowing if the content was received. Data are distributed between parties but collaboration between parties is not distributed.

Of the 39 activities in the handoff, only three activities involved two-way communication: (1) case management rounds; (2) case manager interaction with the patient; and (3) case management and home care intake coordinator interaction with the insurance company. During the study period, there was one instance of two-way communication between the home care case manager and the primary nurse responsible for the patient to clarify patient understanding of self-care insulin administration.
Table 5. Hierarchical task analysis (HTA)

Goal: Conduct an efficient and safe transition to the home care agency and the home care setting

Actors:
- Patient
- Inpatient RN
- Hospital Case Manager (HCM)
- Physician(s)
- Physical Therapist
- Occupational Therapist
- Home Care Case Manager (HCCM)
- Home Care RN

1. **Sub-goal: Identify patient post-discharge service needs**

Plan 1. Do 1.1, through 1.5 in order. If no home care is needed, exit. If home care, then do 1.6 through 1.11 in order and exit.

1.1. Document discharge planning as a focus of need on the inter-professional plan of care (primary care nurse)
1.2. Educate patient on post-discharge planning needs (hospital case manager starts this process on admission)
1.3. Review patient chart to identify post-discharge service(s) that best matches patient needs (hospital case manager)
1.4. Conduct daily and weekly case management rounds to discuss patient progress and determine anticipated discharge date (hospital case manager, physical therapist, occupational therapist, physician(s))
1.5. Make a decision that the patient does or does not need home care (primarily driven by physical therapy who discusses the recommendation with the hospital case manager and physicians during the daily case management rounds)
1.6. Meet with patient and significant others to review clinical team post-discharge recommendations (hospital case manager)
1.7. Solicit patient and significant others input into the post-discharge recommendation for home care (case manager, patient, and significant others)
1.8. Confirm patient agreement for home care from the Home Care Network (hospital case manager).
1.9. Document patient preference for Home Care Network (hospital case manager)
1.10. Confirm insurance carrier and coverage for home care services (hospital case manager)
1.11. Initiate a referral to home care case manager (hospital case manager)
2. **Sub-goal: Home care case manager handoff preparation**
   Plan: Do 2.1 and 2.2, if no, then exit. If Home Care Network has a contract with the insurance company and the patient wants the Home Care Network, then do 2.3 through 2.13 and exit.
   2.1. Confirm that the Home Care Network has a contract with the patient’s insurance company (home care case manager)
   2.2. Review hospital case manager documentation indicating patient preference for the Home Care Network (home care case manager)
   2.3. Review the patient chart to assess appropriateness for home care, past medical history, patient needs at discharge (home care case manager)
   2.4. Confirm that the patient lives in the home care agency’s network service area (home care case manager)
   2.5. Validate the patient’s decision is to engage the Home Care Network during a face-to-face meeting with the patient and/or significant other(s) (home care case manager)
   2.6. Confirm the patient’s address, living arrangement, and levels of stories in the home (home care case manager)
   2.7. Educate the patient and/or significant others on the services provided by home care (home care case manager)
   2.8. Assess potential needs that were not included in the original referral (home care case manager)
   2.9. Review patient chart to identify post-discharge home care needs (home care case manager)
   2.9.1. Write patient information on manual forms (such as medical diagnoses, procedures, case manager referral progress note, insurance, placement specialists if ordered, projected discharge date, equipment needed in home, laboratory results, vital signs, past medical history, admission diagnosis and symptoms, medical progress notes) (home care case manager)

3. **Sub-goal: Home care case manager handoff to home care**
   Plan: Do 3.1 through 3.6 and then exit
   3.1 Enters referral information manually written (using information from the patient chart) into the electronic home care system (home care case manager)
   3.2 Confirm insurance coverage for home care (Intake RN in Central Access)
   3.3 Negotiate number of home care visits with the insurance agency (Intake RN in Central Access)
   3.4 Assign patient to a home care nurse (Intake RN in Central Access)
   3.5 Receive electronic referral from the hospital case manager (home care nurse)
   3.6 Schedule home care visit (home care nurse)
4. **Sub-goal: Discharge to home**
   Plan: Do 4.1 through 4.4 and then exit
   4.1. Produce patient instruction discharge report (physician)
   4.2. Confirm that the patient has discharge instructions and prescriptions (primary care nurse)
   4.3. Complete nursing discharge summary (primary care nurse)
   4.4. Complete medical discharge summary (physician)
   Note: Home Care Nurse has no access to the physician or nursing discharge summary.

5. **Sub-goal: Complete the initial home visit**
   Plan: Do 5.1 through 5.7 and then exit
   5.1. Process referral for home care services (central access department of the home care agency)
   5.2. Confirm insurance coverage for the exact number of visits (home care agency utilization review department)
   5.3. Handoff patient referral information (home care case manager to home care nurse)
   5.4. Review home care referral form (home care nurse)
   5.5. Schedule initial home care visit (home care nurse)
   5.6. Receive patient Discharge Instructions Report (the patient gives a hard copy of the Discharge Instructions Report to the home care nurse)
   5.7. Document patient Discharge Instructions Report in home care system (home care nurse)
   Note: The home care nurse receives the discharge instructions from the patient. The discharge instructions are intended for the patient.

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**Research Questions Three and Four**

What are the artifacts used during acute-to-home care handoffs and what communication channels do nurses use during acute-to-home care handoffs?

There are two main acute-to-home care handoff artifacts. One artifact is the handoff Referral Intake Form (see Appendix B) and the other artifact is the Discharge Instructions Report (see Appendix C). The following artifacts are used to create the Referral Intake Form and the Discharge Instructions Report:

- Medical Progress Notes;
- History and Physical;
• Physician Orders;
• Case Management Progress Notes;
• Physical Therapy Assessment;
• Face Sheet with Insurance; and
• Medicare Form with MD Consult.

The Hierarchical Task Analysis (HTA) was used to create a Communications Usage Diagram (CUD) (see Appendix E), which represents the communication that occurred between the agents involved in each handoff activity; the medium used for the communication; and the effects of the communication (captured through interviews with the home care case manager and home care nurse).

The CUD highlights two parallel processes: (1) The acute-to-home care handoff process; and (2) the Discharge process. Both processes are inter-related, yet involved different artifacts. Table 6 depicts the documents used to create the Referral Intake Form and the Discharge Instructions Report:

<table>
<thead>
<tr>
<th>Artifacts Used to Create Acute-to-Home Care Handoff Artifacts</th>
<th>Artifacts Used for the Discharge Process but Not for Acute-to-Home Care Handoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Medical Progress Notes</td>
<td>• Inter-professional Plan of Care</td>
</tr>
<tr>
<td>• History and Physical</td>
<td>• Nursing Discharge Summary</td>
</tr>
<tr>
<td>• Physician Orders</td>
<td>• Physician Discharge Summary</td>
</tr>
<tr>
<td>• Case Management Progress Notes</td>
<td>• Nursing Assessments</td>
</tr>
<tr>
<td>• Physical Therapy Assessment</td>
<td>• Nursing Progress Notes</td>
</tr>
<tr>
<td>• Face Sheet with Insurance</td>
<td>• Medication Administration Record</td>
</tr>
<tr>
<td>• Medicare Form with MD Consult</td>
<td></td>
</tr>
</tbody>
</table>
Evaluation of the CUD in Figure 9 was divided into four sections: communication between the agents; medium used; effects of the medium; and recommendation communication.

Communication Between Agents

The CUD reveals similar findings as the hierarchical task analysis. The acute-to-home care handoff involves a series of linear steps that are carried out by each responsible party independently. In addition, multiple professionals assess the appropriateness for home care services, taking into consideration the patient’s diagnoses, functional level, and need for supportive care in the home. When assessing the need for home care services or documenting patient information for the home care nurse, the inpatient nurse responsible for the patient is not included, as depicted both within the hierarchical task analysis and the CUD.

However, the CUD reveals two additional findings: (1) There are two parallel but somewhat similar processes, the acute-to-home care handoff and the discharge process; and (2) the documentation completed by the primary nurse responsible for the patient is neither viewed by the case manager nor included when assessing whether or not the patient needs home care. In addition, when the home care case manager accesses the patient record to assess the appropriateness for home care services, they do not access the “online” electronic system (which contains nursing assessment documentation); the home care case manager accesses the physical chart (which contains printed electronic documentation and manual documentation in progress notes). The home care case manager stated “it was not necessary for acute-to-home care handoffs because the purpose is to maximize reimbursement and to ensure the home care services will be
covered by the insurance company.”

**Mediums Used**

The medium used for handoff information exchange and documentation includes a combination of electronically printed reports from the EHR and handwritten manual documentation forms and progress notes. Documentation included in the handoff Home Care Referral Intake Form, originates from physician documentation (progress notes, orders, allergies, history and physical, and diagnoses), laboratory results, and case manager progress note documentation (living arrangement, insurance carrier, post-discharge placement recommendations, equipment needs, and high level nursing orders for home care). The only documentation from the primary care nurse included in the handoff referral form are the vital signs on the day of discharge. The home care case manager documentation is separate from acute care documentation.

The following mediums were used for acute-to-home care handoffs:

- Inpatient Chart (automated and manual artifacts);
- Case Management System;
- Home Care System;
- Face-to-Face Encounters;
- Handwritten Notes;
- Phone; and
- Fax.

The CUD reveals three redundant documentation mediums. First, the home care case manager gathers information from the patient’s chart and manually writes the
information on a sheet of paper. The handwritten information is then keyed into the electronic home care system. Second, multiple parties confirm insurance and prescription coverage (hospital case manager, home care case manager, and the home care intake coordinator). This information is stored in both the electronic home care system, the case management system, and manually in the patient record. Third, during the initial home visit, the home care nurse enters information from the hard copy Discharge Instructions Report into the home care electronic system.

Effects of Medium Used

Both the home care case manager (HCCM) and the home care nurse provided feedback on the effectiveness of the medium used for processes related to handoffs. Mediums that involved face-to-face exchange were reported to be effective and electronic mediums used for insurance verification were also reported to be effective, by the HCCM, the home care nurse, and the home care intake coordinator (IC).

The HCCM reported the following issues with the hard copy of the patient chart: the chart is not organized well; it is difficult to find information; the same information is stored in multiple places; and it takes a long time to find information needed for the referral. In addition, the following comments were received by the home care case manager responsible for the nine patients in the study:

- Finding the past medical history takes a long time because it’s all over the chart.
- The handwritten progress notes are difficult to read.
- When gathering information for the referral, it is inefficient to write information down from one system and then re-key the information into another system.
• Sometimes while talking with the patient, I identify additional needs that the hospital case manager did not find. I would like to speak with the hospital case manager but I have no quick method for accessing them. Frequently I cannot find the individuals needed if the patient requires more than home care support.

The home care nurses reported issues related to the lack of patient information in the handoff, duplicate documentation, errors in patient data received from the inpatient setting, and an inability to view the inpatient record. The following comments were received by the home care nurses in reference to effectiveness of mediums used for handoffs:

• The information contained within the patient discharge instructions has to be ‘re-keyed’ into the electronic home care system.

• There are errors in the data we receive. Sometimes the information doesn’t align with what we’re seeing during the visit.

• The referral form is not completely effective. There is missing information. We discover things during the initial home visit and it would be nice to know these things in advance. For instance, if the patient smokes and is trying to stop smoking or the patient is noncompliant or doesn’t understand how to take their medications. They know this information when the patient is being discharged. Also there are many problems we discover during the initial home visit that are not on the referral form. Sometimes there are problems on the referral form that the patient does not have, so the problems are sometimes the wrong ones.

• There is an inability to see the inpatient record to reconcile data.

It was impossible to assess the effect of the inter-professional plan of care as a medium in the handoff process, because HCCMs do not view the inter-professional plan of care. The CUD reveals that the nurse responsible for the patient and the hospital case manager (HCM) both educate the patient on post-discharge planning needs. However, the education provided by the primary RN and the patient response to education is not included in the handoff to the home care nurse.
Recommended Communication

The home care case manager (HCCM) and the home care nurse provided recommendations to improve communication mediums. Both parties made a recommendation to provide methods for quick electronic communication between parties responsible for care who may be in different geographical locations. The home care nurses want the information on the discharge instruction report to be interfaced (“automatically show up”) in the electronic home care system. This is particularly important for medications and patient problems. In addition, the home care nurses requested access to information in the inpatient record to view discharge instructions and patient problems (“it would be nice to see all of the patient problems”). They want a medium that “eliminates duplicate documentation during the initial visit (re-entering information is inefficient and why can’t we access the discharge summaries done by the nurse and physician on the day of discharge?”).

Research Question Five

What are the types of data and knowledge shared between nurses during acute-to-home care handoffs?

Data gathering for the acute-to-home care handoff actually starts on admission when the hospital case manager (HCM) begins the evaluation to assess post-discharge needs and concludes with the initial home care visit. There are two handoff artifacts shared during the acute-to-home care handoff. The first handoff artifact is the patient Home Care Referral Intake Form (see Appendix B) and the second is the Patient Instructions Discharge Report (see Appendix C). The Home Care Referral Intake Form contains information documented by the home care case manager (HCCM) who is on-site
at the hospital. First, referral information is manually gathered during the home care case manager’s (HCCM’s) review of the patient chart, and then entered into the electronic home care system. The home care nurse has access to the Home Care Referral Intake Form prior to the initial home care visit. During the initial visit, the nurse receives a hard copy of the Discharge Instructions Report from the patient. The Discharge Instructions Report is created by the physician on the day of discharge. Data elements contained within the Home Care Referral Intake Form and the Patient Instructions Discharge Report can be found in Table 7. The acute-to-home care handoff content for each patient were entered into an excel spreadsheet. The data elements were represented using diagnoses, interventions/orders, goals, observations and findings. The other data elements were not included in the spreadsheet to preserve confidentiality (patient name, date of birth, medical record number, episode number, and documentation dates).
Table 7. Data elements: home care referral intake form and discharge instructions report

<table>
<thead>
<tr>
<th>Referral Information (RI) Document</th>
<th>Discharge Instructions Report</th>
<th>Common Data Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Header Information</td>
<td>1. Header Information</td>
<td>• Patient Name</td>
</tr>
<tr>
<td>• Patient Name</td>
<td>• Patient Name</td>
<td>• Date of Birth</td>
</tr>
<tr>
<td>• Date of Birth</td>
<td>• Medical Record Number</td>
<td>• Diagnoses</td>
</tr>
<tr>
<td>• Author of report</td>
<td>• Date of Birth</td>
<td>• Vital signs</td>
</tr>
<tr>
<td>• Start of Care Date for Home Care</td>
<td>• Discharge Date</td>
<td>• Allergies</td>
</tr>
<tr>
<td>• Date Completed</td>
<td>• Admission Date</td>
<td>• Vaccinations</td>
</tr>
<tr>
<td>• Date Entered into Home Care</td>
<td>• Date and time the report was generated</td>
<td></td>
</tr>
<tr>
<td>• Home Care Admit ID number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Diagnoses (medical)</td>
<td>2. Diagnoses (medical)</td>
<td></td>
</tr>
<tr>
<td>3. Inpatient procedures within the last 14 days (yes or no)</td>
<td>3. Problem List (medical)</td>
<td></td>
</tr>
<tr>
<td>5. Equipment</td>
<td>5. Important appointments with provider name</td>
<td></td>
</tr>
<tr>
<td>6. Allergies</td>
<td>6. Appointment date if made</td>
<td></td>
</tr>
<tr>
<td>7. Past Medical History</td>
<td>7. Test, date, and results</td>
<td></td>
</tr>
<tr>
<td>8. Other (living arrangement, admitting symptoms/problems)</td>
<td>8. Allergies</td>
<td></td>
</tr>
<tr>
<td>11. Closed stage III and IV ulcers (yes/no)</td>
<td>10. New Medications</td>
<td></td>
</tr>
<tr>
<td>12. Pneumonia Vaccine (yes, no, unsure)</td>
<td>11. Other Medications</td>
<td></td>
</tr>
<tr>
<td>13. Influenza Vaccine (yes, not, unsure)</td>
<td>12. Stop taking these medications</td>
<td></td>
</tr>
<tr>
<td>14. Referral Case Manager Name</td>
<td>13. Patient education on self-care management (heart failure, blood sugar checking, weight gain if a CHF patient, sternal wound management, diet, when to call the physician, activity, symptoms to look out for)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14. Quality Measures</td>
<td></td>
</tr>
<tr>
<td>Referral Information (RI) Document</td>
<td>Discharge Instructions Report</td>
<td>Common Data Elements</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>15. Client Notified of home care visit (yes/no)</td>
<td>15. Pneumococcal Vaccine Given (yes, no, comment why)</td>
<td></td>
</tr>
<tr>
<td>16. Encounter information document (completed or uncompleted)</td>
<td>16. Heart failure treatment guidelines (vital signs, lab results, symptoms, edema measurement, Heart failure medication adjustments)</td>
<td></td>
</tr>
<tr>
<td>17. Performed date with MD on encounter document (for Medicare patients)</td>
<td>17. Public health awareness, smoking cessation, weight, and BMI monitoring</td>
<td></td>
</tr>
<tr>
<td>18. Visit scheduled and if so, date and time</td>
<td></td>
<td></td>
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<tr>
<td>19. Patient information letter given to patient or mailed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Patient instructed to have photo ID available and Discharge Instructions Report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Home care RN assigned</td>
<td></td>
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</tr>
</tbody>
</table>

The Home Care Referral Intake Form and the Patient Instructions Discharge Report, as the two main handoff artifacts, contain very little nursing data (see Table 9). Of 132 patient diagnoses shared in the acute-to-home care handoff, 117 were medical diagnoses and the remaining fifteen were nursing diagnoses (see Figure 9).
All fifteen nursing diagnoses were documented by physicians. Of the fifteen nursing diagnoses documented by physicians, five (33%) were also documented by the inpatient primary nurse caring for the patient (see Figure 10). However, because nursing documentation is not included in the handoff, the fifteen nursing diagnoses were obtained from the physician documentation.

A comparison of medical versus nursing diagnoses shared in acute-to-home care handoffs reveals that less than 7% of the inpatient nursing diagnoses were shared, while over 80% of the inpatient medical diagnoses were shared in the acute-to-home care handoff (see Figure 10). There were a total of 149 medical diagnoses documented in inpatient documentation and Home Care Referral Intake Formation. Of the 149 medical diagnoses, more than 80% were shared in the acute-to-home care handoff documentation. The 20% of the medical diagnoses not shared during the acute-to-home care handoff were documented in the physician discharge summary, which is generated after the patients were discharged.
Goals

Nursing goals are not shared in acute-to-home care artifacts (Home Care Referral Intake Form and the Patient Discharge Instructions Report). However, there were three goals for one patient related to blood sugar management that were shared in the handoff to home care. These goals were documented by a physician. Nursing goals are documented on artifacts not used in acute-to-home care handoffs. Nursing goals are documented on the inpatient inter-professional plan of care. Nursing goals are also documented on the nursing discharge summary. On every patient’s discharge summary, the nurse evaluates their functional independence related to feeding, transfer mobility, locomotion, social interaction, and expression. However, the nursing discharge summary is not included in the acute-to-home care handoff. In addition, the patient’s goals for post-discharge care are not collected during the inpatient stay. However, the home care nurse solicits patient goals during the initial visit assessment.

Interventions

Unlike nursing diagnoses and goals, the home care nurse has access to nursing
interventions on the Home Care Referral Intake Form. Nursing interventions were documented on the Home Care Referral Intake Form, for every patient in the study (see Table 10). However, because nursing diagnoses and nursing goals are not shared during handoffs, the home care nurse must create context for the interventions using the medical diagnoses. During the interviews with the home care nurses, they stated that context for the nursing interventions on the referral form can be created using the medical diagnoses. They do not rely on the interventions on the referral form, except for scanning them to see if the patient needs blood work or wound care. During the initial visit, the home care nurse performs an assessment, identifies the nursing diagnoses, and then defines interventions for the nursing diagnoses.

The nursing interventions on the Home Care Referral Intake Form are presented in Table 8. Every patient had orders related to nursing assessment, evaluation, education/instruction, notification, and vaccination status. One patient had a list of discharge medications. One patient had a notification of blood work that needed to be drawn because the patient was on Coumadin.
Table 8. Orders on referral form for the home care nurse

<table>
<thead>
<tr>
<th>Orders on Referral Form for the Home Care Nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessment Orders</strong></td>
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<tr>
<td><strong>Evaluation Orders</strong></td>
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<tr>
<td><strong>Education / Instruction Orders</strong></td>
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</tbody>
</table>
Orders on Referral Form for the Home Care Nurse

| Notification Order Status | • Client was notified to have discharge instructions ready for the home care nurse  
|                          | • Client was notified to have a photo ID ready for the home care nurse  
|                          | • Client was notified to have insurance information ready for the home care nurse  
| Vaccination Order Status  | • Documentation on whether the patient received influenza or pneumonia vaccination (all were charted as unsure) |

Observation and Findings

The acute-to-home care handoff artifacts including the following observations and findings: blood pressure, pulse, respirations, weight, height, and body mass index.

**Research Question Six**

What are the differences between plan of care data shared during the acute-to-home care handoff and plan of care data in the acute and home care patient record?

For purposes of this research, plan of care data elements include diagnoses, interventions, and goals. Because a referral to home care is focused on the provision of nursing care, the researcher analyzed nursing diagnoses, interventions, and outcomes from the patient’s chart on day of discharge, shared in handoff, and identified during the initial home care visit. In doing so, the researcher was able to identify gaps in data sharing and/or commonality in data between data on the day of discharge and data on the initial home care visit. Also, by expanding the data elements to include the day of discharge and the initial home care visit, it was possible to identify differences between diagnoses, interventions, and outcomes on the day of discharge, those shared in the handoff, and those identified during the initial home visit.
Nursing Diagnoses

For the entire sample (nine patients), there were a total of 186 nursing diagnoses charted in the patient record on the day of discharge (see Figure 11). Of the 186 nursing inpatient nursing diagnoses, fifteen were shared within the acute-to-home care handoff. A total of 137 nursing diagnoses were documented during the initial home visit.

Figure 11. Total nursing diagnoses

<table>
<thead>
<tr>
<th>Total Nursing Diagnoses</th>
<th>Entire Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient Record Day of Discharge</td>
<td>186</td>
</tr>
<tr>
<td>Shared in Handoff</td>
<td>15</td>
</tr>
<tr>
<td>Initial Home Visit</td>
<td>137</td>
</tr>
</tbody>
</table>

All fifteen nursing diagnoses shared in the acute-to-home care handoff were included in the initial home visit plan of care.

There is some overlap between the diagnoses documented in the inpatient setting with those diagnoses identified during the initial home visit (see Figure 12).
The specific common diagnoses between the day of discharge and the initial home care visit can be found in Table 9.

Table 9. Common diagnoses between day of discharge and initial home care visit

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>Percent of Initial Home Care Visit Diagnoses overlap with Inpatient Diagnoses on Day of Discharge</th>
<th>Common Diagnoses Between Day of Discharge and Initial Home Care Visit</th>
</tr>
</thead>
</table>
| 1              | 65%                                                                                             | 1. Fall risk
|                |                                                                                                 | 2. Pain
|                |                                                                                                 | 3. Respiratory management
|                |                                                                                                 | 4. Risk for infection
|                |                                                                                                 | 5. Impaired physical mobility related to status post coronary artery bypass graft
|                |                                                                                                 | 6. Impaired physical mobility related to pain
|                |                                                                                                 | 7. Knowledge deficit related to disease process
|                |                                                                                                 | 8. Knowledge deficit related to signs and symptoms that require immediate medical attention
|                |                                                                                                 | 9. Knowledge deficit related to medication use
|                |                                                                                                 | 10. Weight monitoring for edema
|                |                                                                                                 | 11. Lower extremity incision
|                |                                                                                                 | 12. Sternal incision
<p>|                |                                                                                                 | 13. High blood pressure |</p>
<table>
<thead>
<tr>
<th>Patient Number</th>
<th>Percent of Initial Home Care Visit Diagnoses overlap with Inpatient Diagnoses on Day of Discharge</th>
<th>Common Diagnoses Between Day of Discharge and Initial Home Care Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>40%</td>
<td>1. Cardiac Monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Blood Sugar Maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Fluid Volume Inbalance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Falls Risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Complete help with hygiene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Ambulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Fatigue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Confused Cognitive State</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Barriers to learning secondary to cognitive confusion and language</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Generalized muscle weakness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. Chest tightness and pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13. Knowledge deficit related to disease process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14. Knowledge deficit related to signs/symptoms that require immediate medical attention</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15. Impaired physical mobility related to reconditioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16. Chest tightness and pain</td>
</tr>
<tr>
<td>3</td>
<td>50%</td>
<td>1. Exacerbation of disease process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Pain management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Education rejection and biopsies post heart transplant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Fall Risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Safe and effective use of medication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Counseling on nutrition and modified diet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Status post left groin drainage and closure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Scrotal edema</td>
</tr>
<tr>
<td>4</td>
<td>14%</td>
<td>1. Medication compliance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Multiple Medications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Fall risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Ambulation</td>
</tr>
<tr>
<td>Patient Number</td>
<td>Percent of Initial Home Care Visit Diagnoses overlap with Inpatient Diagnoses on Day of Discharge</td>
<td>Common Diagnoses Between Day of Discharge and Initial Home Care Visit</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>25%</td>
<td>1. Pain management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. ADLs Hygiene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Fall Risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Self care activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Safe and effective use of medication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Function independently in home environment</td>
</tr>
<tr>
<td>6</td>
<td>36%</td>
<td>1. Pain Management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Fall Risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Hypertension</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Seasonal allergies</td>
</tr>
<tr>
<td>7</td>
<td>32%</td>
<td>1. Self care activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. ADL help</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Fall risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Constipation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Atypical chest pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Post cardiac cath care</td>
</tr>
<tr>
<td>8</td>
<td>28%</td>
<td>1. Safety</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Fall risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Hypertension</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Seasonal allergies</td>
</tr>
<tr>
<td>9</td>
<td>43%</td>
<td>1. Safety / Falls</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Nutrition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Wounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Tobacco abuse</td>
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<tr>
<td></td>
<td></td>
<td>6. Noncompliance</td>
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<tr>
<td></td>
<td></td>
<td>7. Compulsive</td>
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<tr>
<td></td>
<td></td>
<td>8. Agitated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Fatigue</td>
</tr>
</tbody>
</table>
Goals

There were a total of 236 nursing goals for all nine patients on the day of discharge and a total of 307 goals identified during the initial home visit. However, only three nursing goals were shared during the acute-to-home care handoff (see Figure 13).

It was difficult to determine commonality between the inpatient goals and the home care goals because there were varying levels of granularity and variation in terminology used. For instance, an inpatient goal stating that the “patient will independently explain pain management responsibilities” is somewhat similar to, but not exact match for, the home care goal of “client verbalizes and demonstrates anticipatory pain management techniques.”

Figure 13. Nursing goals

The three goals that were shared during handoffs were documented on the physician on the Discharge Instructions Report. The three goals were not documented or referenced on any nursing documentation artifact. The three goals included blood sugar level parameters for a diabetic patient.
Because of differences in terminology used for the goals, as well as varying levels of granularity, it was impossible to determine commonality between the inpatient goals and the initial home visit goals. However, there were similar themes between the inpatient and the initial home care visit goals. Seven themes for both the inpatient and initial home care goals were identified. Only 26 goals (5%) failed to fall into the seven themes identified. The themes included the following areas:

1. Safety;
2. Pain Management;
3. Diet Education;
4. Disease Process Monitoring and Education;
5. Medication Management;
6. Functional Independence with Care; and
7. Care Coordination.

The goals related to disease process monitoring and education showed different expressions between inpatient and the initial home visit. The inpatient goals included physical parameters the nurse was trying to achieve, such as targets for oxygen saturation, blood glucose levels, and zero fall rates. While the home care goals related to disease process focused on patient understanding of the disease process, knowing what to do if certain symptoms arose, and demonstrating ability to perform self care activities necessary for goal attainment. Only two inpatients had goals related to medication management, while every home care visit identified numerous goals related to medication management. For all patients, the initial home visit had more goals related to medication management and education (75) than the inpatient (12).
Interventions on the inpatient plan of care, the referral form, and the initial home care visit were represented at multiple levels of granularity that it was impossible to create a cross-mapping. The orders on the discharge report related to nursing interventions are more specific and granular than the nursing orders on the referral form.

**Research Question Seven**

How does the International Classification of Nursing Practice (ICNP) and the National Quality Forum’s Quality Data Model (QDM) support data and information shared during acute-to-home case handoffs?

**International Classification of Nursing Practice (ICNP)**

There were no nursing documented diagnoses or goals shared in the acute-to-home care handoff. For this reason, data from the patient record for nursing diagnoses, interventions, and goals from day of discharge, acute-to-home care handoffs, and initial home care visit, were extracted and entered into an Excel spreadsheet, for ICNP mapping. The data were mapped against ICNP V 2, 2011 release. The source terminology was manually documented using unstructured forms. This created tremendous variation in source terminology granularity. At times, it was difficult to distinguish a diagnosis from an intervention. For this reason, it was not effective to determine inter-rater reliability. The results of the inter-rater reliability resulted in agreement around the ambiguity of the source terminology for nursing diagnoses. Instead, two raters discussed observations of the mappings in accordance with the qualitative goals of the research to obtain additional insight into nursing documentation related to acute-to-home care handoffs.

The following observations were mutually agreed upon by the two raters:

- The nursing diagnoses, interventions, and outcomes are manually
documented, so there was tremendous variation in granularity (depth and level of detail) and atomic and compositional character;

- There was not enough information about diagnoses to accurately determine whether the term was a diagnosis or an intervention. For instance, high cholesterol management, blood sugar maintenance, and pain management were manually documented in the diagnoses section of the inter-professional plan of care;

- The inpatient nurses used medical diagnoses on the plan of care;

- The nursing goals were more granular and mapped more easily to ICNP terms. This is consistent with another study analyzing acute and home care nursing documentation (Kennedy & Hannah, 2007); and

- The source terminology for nursing interventions was more granular than the ICNP terminology.

Quality Data Model (QDM)

Data from the patient record for nursing diagnoses, interventions, and goals from day of discharge, acute-to-home care handoffs, and initial home care visit, were extracted and entered into an Excel spreadsheet, for mapping to the QDM.

The source terminology was manually documented using unstructured forms. This created tremendous variation in source terminology granularity. At times, it was difficult to distinguish a diagnosis from an intervention. For this reason, it was not effective to determine inter-rater reliability. The results of the inter-rate reliability resulted in agreement around the ambiguity of the source terminology for nursing diagnoses. Instead, three raters discussed observations of the mappings in accordance
with the qualitative goals of the research to obtain additional insight into nursing
documentation related to acute-to-home care handoffs.

The following observations were mutually agreed upon by the three raters:

- The source terminology for nursing goals maps to QDMs concept
  “characteristics.” Characteristics in the QDM contain many concepts in addition
to goals. The lack of discrete structuring of goals within the QDM will create less
granular representations of goals thereby impacting the ability to discretely
represent goals in outcomes measurement.

- QDM supports states of action (such as document, update, report, decline, order).
  For some of the source terms, the states were not explicitly documented. If the
researcher looked at the other data elements in the plan of care, one could assume
the state. However, mappings to states were not possible based on the manual
documentation in the patient chart.

- One of the source terminology data elements contained the state of ‘assigned,’
  indicating the nurse assigned the patient to a home care case manager. There
were no terms for assigned in the QDM states or action.

- It was difficult to map the source terms for diagnoses to the QDM. Components
  of the definitions provided for “characteristics” and “symptom” overlap with the
definition for condition/diagnosis/problems. Specifically, the definition of
characteristics includes mental health issues, adherence issues, coping issues,
grief issues, and substance use issues. However, in the source terminology, these
labels were considered nursing diagnoses.
The QDM definition for condition/diagnosis/problems references “scientific interpretation of a result, assessment, and treatment response data.” However, the source terminology had nursing diagnoses that were not scientifically interpreted based on a result or assessment by the nurse (such as chest tightness and sadness), yet these phenomena were on the problem list and important to nursing care.
CHAPTER FIVE
DISCUSSION

Overall Aim of the Dissertation

This chapter provides an overview of key findings of the study and insights based on an analysis of the data for each of the research questions. Implications of the findings for nursing, informatics, practice, education, and policy will be explored.

The overall purpose of this research study was to explore and analyze patient handoffs by nurses from acute-to-home care settings. The study objectives were to:

1. Describe acute-to-home care patient handoff distributed cognition and patterns of communication related to roles, activities, data shared, and communication channels used;

2. Describe how the International Classification of Nursing Practice (ICNP) represents communication of nursing diagnoses and goals as patients transition from acute-to-home care settings; and

3. Test the National Quality Forum’s (NQFs) Quality Data Model’s (QDM) ability to support acute-to-home care handoffs data and information.

Overview of Research Questions

The research questions that comprised this dissertation build upon each other. Answering the research questions involved the exploration of nursing roles, activities, and data shared during the acute-to-home care handoff process. Through observation,
interviews, and collection of information from the patient, data were collected and analyzed during all steps of the acute-to-home care handoff process. Data were analyzed using the Kennedy Integrated Theoretical Framework for Acute-to-Home Care Handoffs, adapted from distributed cognition, patterns of knowledge, and clinical communication space theory (Coiera, 2000; Liu, Nersessian, & Stasko, 2008; Phenix, 1964).

The first research question explored dimensions of the nursing roles and affiliated activities associated with acute-to-home care handoffs. There are four nurse roles in the acute-to-home care handoff, including the hospital case manager (HCM), the home care case manager (HCCM), the home care intake coordinator (IC), and the home care nurse. The interviews, activity diagrams, HTA, and CUD all reveal multiple and, at times, disconnected role dimensions and threads of activity between all members of the inter-professional team. The acute-to-home care handoff is a highly complex process containing many role dimensions. As depicted in this study, acute-to-home care handoffs are composed of many interconnected activities, which are akin to a system of handoffs within handoffs. Although other institutions may enact acute-to-home care handoffs differently, the process is inherently complex. This is supported in the literature (Anderson & Helms, 1993; Bowles, Pham, O'Connor, & Horowitz, 2010; Naylor et al., 2004).

Furthermore, the findings demonstrate a parallel, but unconnected activity to handoffs: discharge planning. The acute-to-home care handoff process is complex and fragmented with little standardization of roles, dimensions, activities, or data (Anderson, Helms, Black, & Myers, 2000; Bowles, et al., 2010; Clemow, 2006a; D. Dowding, 2001; Lamond, 2000; Naylor, et al., 2004).
Because the process is composed of many role dimensions involving intricate interconnected activities, there is potential for communication failures and missed care. Because the communication pattern is one-way, responsible parties have no way of knowing if an activity failed to occur or communication was not received by the responsible party. The process is highly dependent on the patient or family members for checks and balances. This has implications on costs, efficiencies, safety, and quality. The burden placed on the patients and family impacts patient satisfaction but more importantly raises questions regarding the accountability of professionals within the healthcare system.

Case management goals are to achieve timely and cost effective utilization of resources, which are not always aligned with the home care nurses’ goal to obtain information necessary for nursing care. In terms of meeting the identified information needs of the home care nurse, the inpatient primary nurse actually has the information necessary for nursing care because they are actually providing nursing care to the patient. However, inpatient nursing knowledge is not included in the acute-to-home care handoff. The acute-to-home care handoff is not a clinician-to-clinician handoff, but a facility-to-facility referral for care.

The second research question explored patterns of communication between nurses during acute-to-home care handoffs. Communication and data shared between all parties was predictable, consistent, and one-way. Linear, one-way communication hinders distributed collaboration between parties. As documented by Liu and colleagues (2008), handoffs are an evolving property of interactions between individuals (or systems) through action and perception, rather than a property bounded inside an
individual (Liu et al., 2008). This finding implies that handoff and coordination of care is not an *a priori* schema, but something that emerges through actions and decision-making of both the outgoing and incoming parties involved in handoffs. Distributed cognition theory emphasizes that cognition is distributed or stretched across humans and artifacts (Liu et al., 2008). Cognitive processes are distributed, dynamic, and capable of generating new knowledge.

Ethnographic studies in high risk settings show that handoffs typically include the following: (1) a period of preparation by outgoing provider where data are collected from multiple sources and assimilated; (2) delivery of handoff, where outgoing and incoming parties exchange important information to provide a picture of the patient’s status; and (3) cross-checking of information and prioritizing of care needs by incoming nurses as responsibility is assumed for the next shift (Cheung et al., 2010; Lardner, 1996; Yonge, 2008). In this study, there was no cross-checking of information between parties, except for the daily case management rounds and insurance verification. For this reason, it was difficult to assess whether common ground was achieved. Distributed cognition theory emphasizes that when cognition is distributed or stretched across humans and artifacts, new knowledge is generated (Liu et al., 2008). This new knowledge generated through interactive dialogue between clinicians could improve home care outcomes. This study revealed that when information exchange was one-way with little opportunity for distributed collaboration between responsible parties, nurses reported the medium to be less effective.

The third and fourth research questions explored the artifacts and communication channels used during acute-to-home care handoffs. Acute-to-home care
handoffs are supported through the use of two artifacts, namely the Referral Information Document and the Patient Instructions Discharge Report. These findings revealed that only a subset of both electronic and handwritten patient documentation was used to populate the two handoff artifacts. The structure of the two artifacts limit full expression of the patient’s story. All home care nurses reported the need for information that extended beyond the content of the two discharge artifacts.

Mediums that involved face-to-face (or voice-to-voice) exchange were reported by nurses to effective and electronic mediums used for insurance verification were also reported to be effective. These mediums involved two-way communication. Mediums involving non-interfaced systems, manual documentation, and one-way communication were reported by the nurses to be less effective. This results in redundant documentation but more importantly results in the black box situation where the home care nurses have no access to information from the inpatient record outside of the two discharge artifacts.

The fifth research question explored the types of data and knowledge shared between nurses during acute-to-home care handoffs. Of the 132 patient diagnoses shared in the acute-to-home care handoff, 117 were medical diagnoses and the remaining fifteen were nursing diagnoses. A comparison of medical versus nursing diagnoses shared in acute-to-home care handoffs reveals that less than 7% of the inpatient nursing diagnoses were shared, while over 80% of the inpatient medical diagnoses were shared in the acute-to-home care handoff.

Analysis of communication channels using the CUD showed the need for redundant data capture and storage secondary to the lack of interoperable systems. Electronic systems which fail to interoperate result in redundant data documentation and
there is a heavy focus on providing a retrospective review of medical diagnoses with little
time spent on planning future goals (Anderson & Helms, 1993). The lack of system
interoperability combined with the paucity of two-way communication between providers
has significant implications for Accountable Care Organizations (ACOs). How can ACOs
be responsible for care without an infrastructure for technological communication and,
more importantly, for clinician-to-clinician two-way communication?

The sixth research question explored the differences of plan of care data
between what is present on the day of discharge, shared in the handoffs, and identified
during the initial home visit. For the entire sample (nine patients), the trend demonstrated
large numbers of nursing diagnoses, interventions, and outcomes on day of discharge;
very few shared in the handoffs; and then large numbers identified during the initial home
visit. Attempts to determine concordance between inpatient, handoff, and initial home
care visit plan of care data elements were unsuccessful secondary to tremendous variation
in terminology. However, because a referral to home care is focused on the provision of
nursing care and very little happens to change the patient’s nursing care needs during the
patient transport from the hospital to their home; it is possible that commonality is
present. There is no research in this area for comparison.

The seventh research question explored the ability of INCP and the QDM in
representing nursing diagnoses, interventions, and outcomes shared during acute-to-home
care handoffs. The source terminology for nursing diagnoses extracted from manual
documentation was difficult to map because it was difficult to determine whether the
term was a diagnosis or intervention. The source terminology for both interventions and
goals was more granular than the ICNP terminology. This is consistent with another
study analyzing acute and home care nursing documentation (Kennedy & Hannah, 2007). Through post coordination the source concepts can be represented using ICNP. However, the large terminology set within ICNP, combined with the need for post coordination support, could present implementation challenges for both vendors and providers (Coenen & Kim, 2010). The creation of ICNP catalogues for transitions of nursing care may possibly enhance transmission of nursing data. Further research, using electronic nursing documentation sources, will provide value in determining the utility of ICNP in representation acute-to-home care handoff content.

The ability of the QDM to discretely represent nursing is deficient. Components of the QDM definitions provided for “characteristics” and “symptom” overlap with the definition for condition, diagnosis, and problems. Specifically, the definition of characteristics includes mental health issues, adherence issues, coping issues, grief issues, and substance use issues. These labels are considered diagnoses within the scope of nursing practice. If nursing diagnoses have to be split across two QDM concepts (diagnoses, characteristics, symptoms), what are the implications for quality reporting? In addition, there is a QDM concept labeled “transfer” to support continuity and coordination of care. Transfer refers to the different locations or settings a patient is released to, or received from, to ensure the coordination and continuity of healthcare. In addition to transfer, care coordination functions typically involve a discharge from one location (hospital) and an admission to another location (home care agency). It is not clear how these concepts are handled within the QDM.

**Significance of the Study**

This study’s aim of discovering role dimensions, activities, and data shared
during the acute-to-home care handoff process to improve transitions of care is a Joint Commission patient safety goal and a top national priority as defined by the National Priorities Partnership (National Priorities Partnership, 2008; The Joint Commission, 2008). The increasing number of patients moving from inpatient settings to home care points to the urgent need for standards and best practices for communication of information as patients transition from one setting to another across the continuum of care (Steiner, Elixhauser, & Schnaier, 2002). To this extent, the Joint Commission now requires accredited facilities to perform medication reconciliation across the continuum of care (The Joint Commission, 2008c). Moreover, the Joint Society of Hospital Medicine–Society of General Internal Medicine Continuity of Care Task Force also recently published a systematic review with recommendations for improving the handoff of patient information at discharge. Apart from these recommendations, it is uncommon to find evidence-based data on requirements necessary for effective acute-to-home care handoffs.

Lamond (2000) contends that studies using theoretical frameworks that compare information shared to information available are needed before establishing handoff recommendations. This study is the first, to the researcher’s knowledge, to explore role dimensions, activities, and data shared in acute-to-home care handoffs, using a theoretical framework as the basis for analysis of handoff information content. The Kennedy Integrated Theoretical Framework for Acute-to-Home Care Handoffs explains how data and information get distributed among caregivers to support transitions of care. This study demonstrated how patterns of knowledge (handoff content), when sent through communication channels (electronic, face-to-face, handwritten notes and phone) that
enable shared cognition and collaboration, are more effective. This study demonstrated the relationships depicted in the theoretical framework. Communication and data shared between all parties was predictable, consistent, and flowed through multiple communication channels to reach all participants. Use of communication mediums that allowed for shared collaboration were reported by nurses to be more effective than those that did not. However, use of linear, one-way communication mediums were reported to be less effective and more commonly used. This is consistent with distributed cognition theory which purports that when cognition is distributed or stretched across humans and artifacts, it is dynamic and capable of generating new knowledge (Liu et al., 2008). This is also consistent with findings in a study showing positive outcomes when interactive discussion and creation of contingency plans for potential future problems were integrated into the handoff (Flanagan, Patterson, Frankel, & Doebbeling, 2009).

Nursing documentation was not included in the handoff, nor was it taken into consideration during any handoff activity. Therefore, only a subset of the patient’s full story was communicated to the home care nurse. There is a paucity of nursing diagnoses and goals shared in the handoffs. All nurses reported that documented patient problems are needed and they are currently not getting the full problem list. This is consistent with studies by Fenton (2006) and McMahon (1990) that showed less sharing of information related to the interdisciplinary plan of care. This is also consistent with a study by Lardner (1996) that reported missing, unnecessary, or inaccurate information of variable quality; heavy focus on providing a retrospective review; and failure to carry forward information over successive shifts (Lardner, 1996). These findings are consistent with the literature showing that acute-to-home care handoff content is heavily focused on the
exchange of medical diagnoses, with almost no exchange of nursing and psychosocial information (Anderson et al., 2000). This is consistent with another study that showed the inability to retrieve information from computer systems as a major barrier to effective handoffs (Anderson et al., 2000).

When interviewed, one home care nurse stated she received most of her information from the ‘patient telling their story.’ This is consistent with Bowles and colleagues (2010) who found that information gaps are frequently compensated by home care nurse dependency on patient and family recall of hospital events (Bowles et al., 2010). The lack of information exchange related to nursing care is critical, given that patients are discharged to home care, specifically for nursing care. Furthermore, patient conditions requiring nursing care do not change during the transport from the hospital to their home, particularly for patients with chronic conditions.

Studies comparing information deemed important for handover with information that is actually shared showed tremendous variation between studies. A few nursing studies have identified consistent communication of certain information, such as patients’ name, age, diagnostic findings, diagnosis, orders, and medical treatment, while other studies demonstrated inconsistent and inadequate sharing of information (Benson, Rippin-Sisler, Jabusch, & Keast, 2006; Clemow, 2006b; Dawn Dowding, 2001).

The findings of this study were consistent with other studies: much of the information shared in handoffs was general, related to insignificant activities of the prior events, and lacked the granularity necessary for nursing intervention (Jordan, 1987; Sherlock, 1995; Williams, 1998).

This study revealed gaps in information exchange evidenced by the exchange of
fifteen nursing diagnoses and three nursing goals for nine patients. More than 80 percent of the medical diagnoses were shared during the acute-to-home care handoff, while less than seven percent of the nursing diagnoses were shared. This is consistent with other studies which found significant gaps in information exchange. A study by Anderson and Helms (1993) showed that only one half of the information needed for skilled nursing home care was communicated at discharge and furthermore the content shared varied greatly by the type of home care agency, as well as the method for exchange (phone, fax, electronic methods) (Anderson et al., 2000). Similar to handoffs that occur within the same setting, acute-to-home care handoff content is heavily focused on the exchange of medical diagnoses, with almost no exchange of nursing and psychosocial information (Anderson et al., 2000). Furthermore, content shared during transitions to home care was better for home care agencies associated with hospital systems (Anderson et al., 2000).

This study shows that the inpatient plan of care is focused on treatment, stabilization, and specific patient targets, while home care goals are focused on patient understanding of disease states and what to do if certain symptoms develop. If the home care nurse had access to the inpatient plan of care on day of discharge, would they be able to convert and/or reconcile the plan of care into one suitable for home care? Future research is needed to answer this question.

This study revealed that acute-to-home care information exchange is incomplete, retrospective, and medically focused, driven by reimbursement incentives. The acute-to-home care handoff is essentially a black box, viewed solely in terms of its input, output, and transfer characteristics, but not explored in terms of handoff content exchanged and needed for continuity of care. This study revealed the need for standardized methods,
processes, and roles to support acute-to-home care handoffs in the areas of: (1) Nursing practice representation in handoff content; (2) Integration of the inpatient plan of care as a dynamic document which spans the continuum of inpatient to home care; (3) Clearer definition of roles, responsibility, and accountability in acute-to-home care handoffs; and (4) Evolution of patient discharge to patient transition as a construct to support continuity of care.

**Implications for Informatics**

The Kennedy Integrated Theoretical Framework for Acute-to-Home Care Handoffs (see Figure 14) appeared to be adequate for describing acute-to-home care patient handoff roles and activities.

However, there were findings that revealed the need for future research using the Kennedy Integrated Theoretical Framework. Patterns of knowledge theory is adequate in framing data, information, and knowledge shared during acute-to-home care handoffs. One of the types of knowledge requested by the home care nurses in the study is integrated knowledge, which involves the synthesis of empirical, personal, and nondiscursive knowledge into a comprehensive description of the patient’s past and present, as well as predictions about the future (Phenix, 1964). According to the model, this integrated knowledge takes the form of a plan of care. Specific events are threaded together with other events, and relationships between events are communicated so the receiving nurse can construct an integrated form of knowledge using all of the patient information presented. This form of knowledge takes empirical, personal, and nondiscursive knowledge and integrates it into a story about the patient, including the past, present, and plans for the future. Although this form of knowledge is needed to
provide care, this study raised questions about the data models and structures necessary to represent integrated knowledge synthesis of empirical, personal, and nondiscursive knowledge. Are existing representations of the plan of care including diagnoses, interventions, and outcomes sufficient enough and what other aggregated data representations are necessary to form the patient story? Given the vast amount of patient data, this study revealed the complexities associated with identifying data that are important and germane to nursing care when transitioning patients. Although structured terminologies can represent nursing knowledge, evidenced by the ability to map nursing documentation to ICNP and QDM, the study revealed the need for decision support tools to identify data that are important for transitional handoffs. The Kennedy Integrated Theoretical Framework for Acute-to-Home Care Handoffs needs to take decision-making concepts into consideration.

In terms of knowledge representation, combining patterns of knowledge (knowledge source) and distributed cognition (sharing of the knowledge) with clinical communication space theory (communication channels to send the knowledge through) revealed that specifications need to be defined to determine where information should be stored in the EHR. For instance, patient problems were found in multiple locations within the EHR (history and physical, problem list, interprofessional plan of care, assessments, and progress notes) with entries made from multiple clinical professionals. Some electronic sources of the problem list may be more valid than others because of the responsible party documenting the problem or contextual data associated with the problem (e.g., resolved, suspected, not sure). The home care case managers reported uncertainty because many times the documenter failed to indicate whether the problem
was active, resolved, etc. There is a need for standardized documentation as well as standardized locations in the chart as the first foundation for interoperability.

Figure 14. Kennedy integrated theoretical framework for acute-to-home care handoffs

The overall purpose of this research study is to explore and analyze patient handoffs by nurses from acute-to-home care settings. The study objectives are as to: 1) Describe acute-to-home care patient handoff distributed cognition and patterns of communication related to Roles, tasks, and activities within the handoff process; Data and knowledge shared; and Communication channels used; 2) Describe how the International Classification of Nursing Practice (ICNP) represents communication of nursing diagnoses and goals as patients transition from acute-to-home care settings; 3) Test the National Quality Forum’s (NQFs) Quality Data Model (QDM) ability to support acute-to-home care handoffs data.

In addition, there is a need for standardized models for representation of the plan of care within the EHR at multiple levels of granularity. This is complicated by the lack of industry data standards and representation for the plan of care. As the research indicates, the creation of standard information models for the plan of care (diagnoses, interventions, goals) will form the cornerstone of care coordination improvements.

However, there is little research on the use of such models. More importantly, there are few standards on what the model should look like. Current efforts are underway within
Health Level Seven International (HL7) to define a standard model for the plan of care (HL7, 2011b). In parallel, the U.S. Office of the National Coordinator (ONC) is leading efforts to define content necessary for the plan of care, using care coordination use cases as the primary vehicle for this definition. The theoretical framework was updated to reflect the plan of care as an artifact (see Figure 15).

Utility of the Kennedy Integrated Theoretical Framework for Acute-to-Home Care Handoffs representation of distributed cognition theory was useful in discovering informatics implications for acute-to-home care handoffs. The study revealed that nurses found two-way distributed information sharing to be more effective than one-way communication. Use of EHRs in supporting two-way communication between recipients requires electronic transmission, receipt, and acknowledgement of messages. However, if the system sends a message that something was received, such as a home care referral, there is no way of tracking whether the referral was read and processed by the receiving party (acknowledgement) without additional data fields and action on part of the receiving party. This has implications for system design and clinician workflow. However, this requirement is important because clinicians involved in acute-to-home care handoffs are in disparate locations. The concept of acknowledgement (confirmation of receipt of data and information) has been added to the theoretical framework (see Figure 15).

Clinical communication space theory implies that common ground is achieved through use of various communication methods. However, there were instances where the home care case manager, the physical therapist, and the patient failed to agree on post-discharge placement. In all but one of the situations, common ground was achieved
through discussion. However, in one situation, no common ground was achieved secondary to varying clinician perspectives. Clinical communication space theory needs to accommodate analysis of information when no common ground is achieved and the decision is made based on authority. During these situations, no information is exchanged, because decisions are based on hierarchical rule within the organization. As a result of this research, common ground was added to the framework (see Figure 15). Additional research is needed to fully assess the informatics implications of common ground when it is implicitly achieved without overt communication. What implications does this have for care coordination when the information ‘not communicated in acute care’ has implications for, or is pertinent information for, home care?
Kennedy Integrated Theoretical Framework (Updated)
Acute-to-Home Care Handoffs

Theory

Distributed Cognition

- Activity system
- Cognition / shared cognition
- Cognitive tasks
- Shared cognition
- Distributed collaboration

Patterns of Knowledge

- Knowledge (empirical, nondiscursive, personal, integrated)
- Data and Information
- Knowledge objects

Clinical Communication Space

- Communication
- Communication information continuum
- Communication channels
- Command
- Common ground (Update)
- Acknowledgement (Update)

Concepts

- Plan of Care (Update)
- International Classification of Nursing Practice (ICNP)
- Quality Data Model (QDM)

Artifacts

- RN handoffs activities from acute to home care
- Handoff agents (RN and Computer)

- Handoff tools (forms, databases, checklists, etc.)
- Handoff method (phone, face to face, fax, electronic documentation, etc.)

Variables

- Handoff activity system
- Communication patterns

- Adequacy of ICNP and the QDM
- Handoff communication channels
- Common handoff concordance

Study

The overall purpose of this research study is to explore and analyze patient handoffs by nurses from acute-to-home care settings. The study objectives are as to: 1) Describe acute-to-home care patient handoff distributed cognition and patterns of communication related to Roles, tasks, and activities within the handoff process, Data and knowledge shared, and Communication channels used; 2) Describe how the International Classification of Nursing Practice (ICNP) represents communication of nursing diagnoses and goals as patients transition from acute-to-home care settings; 3) Test the National Quality Forum’s (NQFs) Quality Data Model (QDM) ability to support acute-to-home care handoffs data.

Implications for Nursing Practice

ICNP appeared to be adequate in representing nursing data for care delivery, care transitions, and quality measurement. In some instances, the source terminology was more granular, but ICNP supported post-coordinated expression of the concept. In addition, the manual sources of nursing documentation could be represented using both ICNP and also the QDM for quality measurement. Both methods of representation were complementary. This is important for quantification of nursing practice on outcomes. The study revealed that nursing documentation in the inpatient record is not used by anyone.
on the clinical team for the acute-to-home care handoff. This could be a reflection of the current reimbursement model for care delivery. A review of the artifacts revealed a strong medical model of information exchange, potentially demonstrating a continuation of medical care following physician orders. Sandelowski points out, “...for most of the history of nursing, nurses (as women) and technology (in the form of material devices, such as x-ray machines, techniques, such as surgery and organizational systems, such as hospitals and specialized units of care) have been represented as embodied extensions of physicians and as servants both to physicians and to the general public in the fight against disease” (Sandelowski, 1999, p. 199).

Standardized approaches to nursing documentation within the electronic health record need to be comprehensively agreed upon. The study revealed tremendous variation in nursing documentation content. EHRs, combined with structured nursing terminology, provide an opportunity to streamline care delivery processes, facilitate care coordination, and measure impact on outcomes through data mining. There are multiple methods for achieving this goal and with the advent of technological advances, nursing has the opportunity to expand into goal directed care that uniquely describes nursing contribution to healthcare (Mitchell, Petrovskaya, McIntyre, & Frisch, 2009; Montalvo & Dunton, 2007). However, without professionally supported models and best practices for representation of nursing practice above and beyond structured terminology, variation will continue.

Implications for Education

Recognizing the demands of an increasingly electronic healthcare environment, nursing education must be redesigned to keep up with the rapidly changing technology
environment. This study revealed the need for education on care coordination and transitions of care at all levels of nursing education. There is a need for educational methods for teaching nurses how to have a contextual awareness of environments outside the specific environment in which they are excellent in providing care. Many times the home care nurses stated they ‘knew this patient had this problem in the hospital and it could potentially impact their care at home.’ However, the inpatient nurse is solely focused on inpatient care and more importantly focused on moving the patient to a discharged state. Integration of care coordination concepts are needed within all levels of nursing education. One of the most significant implications for nursing education hinges on the concept of discharge planning. Should discharge planning as a concept be replaced with transition planning?

Implications for Policy

The U.S. is investing close to $50 billion in the use of information technology to improve care quality (Office of the National Coordinator, 2006). The third health policy priority of the EHR Incentive Program is improving care coordination, referred to as Meaningful Use, and is focused on improvements in information exchange, decision-making, and quality (Jha, 2010). Furthermore, NQF has endorsed preferred practices for the use of information technology and care coordination focused on the use of interoperable, standardized electronic information systems with functionalities essential to care coordination, decision support, quality measurement, and practice improvement (NQF, 2010). Currently, Meaningful Use Phase 2 decisions are underway. Input from all stakeholders is necessary to meet national goals for the development of a patient centered electronic health record for effective care coordination. Nursing’s success in impacting
policy hinges on advancement in nursing research. Data and knowledge that come from empirical informatics research are needed when nurses provide testimony on existing policy and seek to influence future policy decisions.

**Study Limitations**

Although this study was conducted using a limited sample, the sample size was appropriate given the study aims and objectives to obtain rich and detailed information about acute-to-home care handoffs. Only one researcher observed the handoff process but this provided for consistency and reliability in data gathering across all nine patients. However, there are two limitations that do impact the study. First, nurses self-reported information on the handoff process. Nurse recall bias or threat of evaluation may influence their feedback. Second, the study was conducted at one organization. There is no way to determine whether the acute-to-home care handoff processes at the organization are typical of other organizations. Additional research is needed.

**Implications for Future Research**

The use of the Kennedy Integrated Theoretical Framework of distributed cognition, patterns of knowledge, and clinical communication space theory should be studied further to validate application to acute-to-home care handoffs. Repeating this study in environments using electronic documentation will provide additional insight into roles, activities, and data associated with acute-to-home care handoffs. This study focused on extraction of nursing terms that were manually documented, showing tremendous variability which made coding to ICNP and the QDM difficult. Research on nursing document types and documentation template structures is needed as a precursor to the development of interoperable electronic records. Furthermore, research on the
relationship of discharge planning to care coordination, transitions of care, and acute-to-home care handoffs is needed. There are overlapping aspects to each of these concepts. This study raised questions about whether the term ‘discharge’ is the appropriate term of use. Discharge means to release and implies that the patient is cured, when in fact, the patient is moving along a continuum of health and wellness (Random House Dictionary, 2010). This study revealed similarities between the inpatient and home care plan of care. Research is needed to better understand how home care nurses make decisions when converting inpatient care information related to the plan of care into plans of care for the home care setting.

**Conclusions**

This dissertation aims to describe acute-to-home care patient handoff distributed cognition and patterns of communication related to: roles, tasks, and activities within the handoff process; data and knowledge shared; and communication channels used were achieved. In addition, the study described how ICNP and QDM can represent communication of nursing diagnoses, interventions, and goals as patients’ transition from acute-to-home care settings.

This was the first United States study (to the researcher’s knowledge) that compared day of discharge, acute-to-home care handoff, and initial home care visit documentation for differences and similarities. The study revealed a very complex and fragmented process devoid of acute-care nursing representation in decision-making regarding post-discharge care and in sharing of data in the acute-to-home care handoff. A comparison of medical versus nursing diagnoses shared in acute-to-home care handoffs revealed that less than 7% of the inpatient nursing diagnoses were shared, while over
80% of the inpatient medical diagnoses were shared in the acute-to-home care handoff. Furthermore, inpatient nursing plan of care on the day of discharge is not shared in acute-to-home care handoffs. However, when the home care nurse completes the initial home care visit, the problems and goals on the home care plan of care reflect similar domains of care as the inpatient day of discharge plan of care. However, the plan of care in the acute-to-home care handoff has no nursing care content. This black box between inpatient care and home care is revealed when the patient tells their story and the home care nurse performs an assessment that leads to a plan of care. This is exacerbated by single threaded one-way communication channels during the acute-to-home care handoffs. These findings are consistent with the literature. The concept of a dynamic plan of care that is not relinquished upon discharge warrants investigation. All four of the home care nurses stated that many of the problems they treat in the home were most likely present during the inpatient stay. The results of this study will inform future efforts related to process improvement and data standardization for purposes of facilitating coordination of care across the care continuum.

In summary, the study findings demonstrate:

- A lack of nursing representation in acute-to-home care handoffs:
  - The primary care nurse is not involved in daily meetings where post-discharge plans are defined;
  - Of the 132 patient diagnoses shared in the acute-to-home care handoff, 117 were medical diagnoses;
Less than seven percent of the inpatient nursing diagnoses were shared, while over 80% of the inpatient medical diagnoses were shared in the acute-to-home care handoff;

Home care nurses reported getting nursing information from the patient’s story;

- One-way communication channels with little opportunity for distributed collaboration between responsible parties;

- Electronic systems which fail to interoperate, which results in redundant data documentation; and

- Interesting patterns between the inpatient plan of care on discharge day and the plan of care for the initial home visit. This requires additional inquiry into the concept of a dynamic plan of care that spans the continuum.
APPENDIX A

HOME CARE CASE MANAGER INTERVIEW RESULTS
Table A1. Home care case manager interview results

<table>
<thead>
<tr>
<th>Interview Question</th>
<th>Case Manager One</th>
<th>Case Manager Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) What is your role in the acute-to-home care handoff process</td>
<td>My role as home care case manager is to coordinate an efficient and safe patient transition from the hospital to the Home Care Network.</td>
<td>My role as home care case manager is to facilitate a smooth transition to the Home Care setting. Once the hospital case manager hands off the patient as a discharge to home, all aspects of that transition become the responsibility of the home care case manager. The hospital case manager is no longer involved in the transition unless the home care case manager has questions.</td>
</tr>
<tr>
<td>2) What is your goal and how do you know if you were successful?</td>
<td>The goal is to obtain a complete list of medical diagnoses to ensure insurance coverage. So my goal is to get insurance reimbursement so the home care nurse can take care of the patient. If I get insurance coverage and complete all the paperwork, then I’m successful.</td>
<td>My goal is to make sure the patient has insurance coverage, that all equipment arrives, and if they need blood work, to make sure there is a way to get the blood drawn (either lab or the home care nurse). I also want to make sure they have insurance coverage for special meds (like lovonox).</td>
</tr>
<tr>
<td>3) What tasks / activities do you carry out during this process</td>
<td>I confirm the patient’s preference for the Home Care Network. Then I make sure that all insurance authorizations are arranged prior to patient handoff to the Home Care Network. I ensure that all services and equipment are arranged prior</td>
<td>My tasks include an analysis of all potential needs in the home, including any potential blood work that needs to be done post-discharge, such as Coumadin. I make sure all durable medical equipment (DME) is arranged</td>
</tr>
<tr>
<td>Interview Question</td>
<td>Case Manager One</td>
<td>Case Manager Two</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>to patient discharge. I provide patient and / or family education on the home care service. I analyze potential needs in the home, (i.e., patient new to insulin or blood work related to Coumadin, etc.). If the patient will receive home infusion – I work with the home infusion team to find out if the patient has insurance coverage for home infusion. If the patient is not receiving home infusion, the hospital case manager usually informs the patient of insurance coverage. for home delivery so it’s ready the day of discharge. I also make sure there is coverage for home infusions. All of this must be in place before the patient can be discharged to home. If the physician is sending the patient home on Lovonox and the patient has no coverage for the drug, the discharge to home is stopped until there is another plan in place. The final piece of the handoff is getting authorization from the patient’s insurance company for home care.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Is there a specific sequence to the tasks you perform?</td>
<td>1. I receive a referral from the case manager who has offered the patient choice and they have chosen our agency. 2. I confirm in the hospital EHR, that the patient is in the home care geographical service area and we are we are contracted with their insurance. 3. I review the chart for home care appropriateness, past medical history and needs at discharge. 4. I meet with the patient and/or family to explain the services, determine if they are in agreement with the services, determine needs further and confirm</td>
<td>The first priority is assuring that the pt has coverage for any medicines, and equipment, that they will need at the time of discharge. Discharging a patient on Lovonox, or home with a Wound Vac means little if the pt can not get the supplies or durable medical equipment. So the priority first is getting coverage, then confirming the patient is agreeable to home care with our agency, then I make sure all services are lined up and ready at discharge.</td>
</tr>
<tr>
<td>Interview Question</td>
<td>Case Manager One</td>
<td>Case Manager Two</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4. What data and knowledge do you need to perform the handoff activity?</td>
<td>Access to patient information – problems, medications, equipment needed in the home, current patient status, past medical history, patient understanding of self care post-discharge, demographic information, transportation</td>
<td>A full list of discharge medications, equipment needs, and what social structure the patient has in place to facilitate a safe discharge home.</td>
</tr>
</tbody>
</table>
| 5. Where do you get the data and knowledge? | • Patient chart (both manual and automated)  
• Case management system/  
• Interaction with the case manager, physical therapy, staff nurses, and physicians caring for the patient | Through communication with the attending, the hospital case manager, a full chart review, and communication with, and assessment of, the patient. |
<p>| 6. What data do you document during this process and where do you document (manual form, automated system)? | I document the referral in the home care system. The referral includes the patient diagnoses, allergies, past medical history, hospital course, procedures done, equipment, vital signs, height/weight, and services ordered (nursing, physical therapy, etc.). I also document in the inpatient chart in the progress notes. I document a note | All documentation is done in the patient’s chart – some electronic and some of it is manual. Data documented includes all aspects of the discharge, including insurance coverage for specialty services and durable medical equipment, as well as what services will be provided in the home, as well as who |</p>
<table>
<thead>
<tr>
<th>Interview Question</th>
<th>Case Manager One</th>
<th>Case Manager Two</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. How do you communicate the information to the receiving nurse during this process?</td>
<td>Stating the patient preference is the Home Care Network.</td>
<td>is following the patient from the home care agency.</td>
</tr>
<tr>
<td></td>
<td>Through the referral form – first the information is manually written on the form, and then entered into the home care system. When the patient is a complicated case, I will speak with the home care agency care team coordinator who is a registered nurse.</td>
<td>The information for the receiving referral note is communicated electronic home care system. This summary includes all past medical history and procedures that took place while the patient was in the hospital, as well as any special orders, or concerns that I have found during my assessment of the patient and their particular situation, such as the need for a social worker to be included in the patients home care order set.</td>
</tr>
</tbody>
</table>
APPENDIX B

HOME CARE REFERRAL INTAKE FORM
Homecare Referral Intake Form

Admission Note Report
By: Organization, By: Person

Admit ID:
Entered: 4/21/2011 10:28:29AM by:
Completed: 4/21/2011 11:16:33AM by:

Diagnosis: CAD NSTE MI Transient delirium Uncontrolled DM
sp CABG X 3 4/12/2011
sp Sternal rewiring 4/15/2011
sp Cardiac cathe 4/8/2011

Inpatient procedures within 14 days of hospital stay

PT: Assessment: Eval safety mobility and gait. Assess and instruct home precautions. Eval for OT.

MSW: Community Resources: Refer to community resources and indicated

Equipment: Has a cane walker and glucometer

Allergies: NKA

Past Medical History: CAD sp MI in 2000 sp stent Chronic left shoulder pain DM HLD 45 pack year tobacco use MVA 6 months ago.

Other: Admit with worsening left shoulder pain radiating to neck. Admit to CSI1 Client with elevated troponins which peaked to 6.6 Transfer to TUH for cardiac cath showing need for CABG. Client also had CTA which showed an ascending aortic aneurysm about 4.5 cm and a palm nodule in RML. Client with post op hypoglycemia requiring insulin. SC which client will be DCG forms on insulin. Evaluation begins at TUH. Client lives alone in 2nd floor apt and says he has no furniture except for a bed. Family does not live in the area.

Vitals: 4/21/2011 Temp 97.8 HR 87 RR 20 BP 142/69

HT: 30.11 in WT: 204.1b

Closed Stage III and IV Ulcers None

Pneumonia: Recid 4/8/2011

Influenza: Vaccine: Unsure

Referral Contact: [Redacted]

Client Notification: Yes

F2F: Encounter Information Document not completed
F2F: Performed on 4/18/2011 with [Redacted]
F2F: Rescheduled
F2F: Unscheduled

Patient information letter given… mailed

Patient instructed to have photo identification, insurance information and discharge instructions if had IP stay ready for the clinician.
APPENDIX C

DISCHARGE INSTRUCTIONS REPORT
Discharge Instructions Report

MR# 54027685, Account# 45404929  Date of Birth: 11/5/1992

Diagnosis
Pneumonia

Procedure(s)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Date</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominoplasty</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Problem List
Asthma
CHF
Systolic: EF 35% on 4/20/10

Diabetes mellitus
Hyperlipidemia

Important things To Do

Appointment(s)

<table>
<thead>
<tr>
<th>To Do</th>
<th>Provider</th>
<th>Specialty - Location - Phone</th>
<th>Date and Time</th>
<th>or Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Geno J. Merli, MD</td>
<td>Internal Medicine - Gibbon Bldg., Ste. 6270, 111 S. 11th Street, Philadelphia, PA</td>
<td>10/07/2010 8:30 a.m.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barry S. Ziring, MD</td>
<td>Internal Medicine - 833 Chestnut Street, Suite 701, Philadelphia, PA</td>
<td>Call now for appointment</td>
<td></td>
</tr>
</tbody>
</table>

Tests

<table>
<thead>
<tr>
<th>To Do</th>
<th>Test</th>
<th>Location and Phone</th>
<th>Date and Time</th>
<th>or Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chest Xray</td>
<td>Jefferson General Radiology, 1 (800) 858-1662</td>
<td>Call now to have test done in 2 weeks</td>
<td></td>
</tr>
</tbody>
</table>

Test Results (Selected)

<table>
<thead>
<tr>
<th>Test</th>
<th>Date</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest Xray</td>
<td>09/13/2010</td>
<td>right lower lobe infiltrate. recommend follow up after antibiotics.</td>
</tr>
</tbody>
</table>
### Medication Information

#### Allergies

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>PENICILLINS</td>
<td>Hives/urticaria</td>
</tr>
</tbody>
</table>

#### Medications

You should take the medications listed below when you leave Thomas Jefferson University Hospital. This list includes home medications that you have reported during your hospitalization here. I have reviewed this list, and have explained and noted contraindications (if any) between your home medications and any prescriptions you have received as a result of this hospital stay/visit. Please bring this form to all your physicians for their review. If you have any questions, please contact your physician.

#### New Medications

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Directions</th>
<th>Comment</th>
<th>Action / Take for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxifloxacin (400 mg)</td>
<td>Take orally 1 tablet daily</td>
<td>take for 7 more days</td>
<td>New medicine for Pneumonia</td>
</tr>
<tr>
<td>(AVELOX)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Other Medications

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Directions</th>
<th>Comment</th>
<th>Action / Take for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyburide (5 mg) (DIABETA, MICRONASE)</td>
<td>Take orally 1 tablet daily, before breakfast</td>
<td></td>
<td>Dose decrease for Diabetes mellitus</td>
</tr>
<tr>
<td>Levalbuterol HCl (0.63 mg/3 mL) (XOPENEX)</td>
<td>Inhalation 0.5 ml every 8 hours</td>
<td></td>
<td>Dose decrease</td>
</tr>
<tr>
<td>Atorvastatin (20 mg) (LIPITOR)</td>
<td>Take orally 1 tablet daily as needed</td>
<td>test comment</td>
<td>Same as pre-admission for Hyperlipidemia</td>
</tr>
<tr>
<td>Ramipril (5 mg) (ALTACE)</td>
<td>Take orally 1 capsule daily</td>
<td></td>
<td>Same as pre-admission for CHF</td>
</tr>
</tbody>
</table>

#### STOP taking these medications

stop taking aspirin
**General Medication Comments:**
general medication free text area

**Pain Management**
pain management free text area

**Narcotic Statement**
You have been prescribed a medication which will cause drowsiness or dizziness. Use caution when driving, operating machinery, or performing other hazardous activities. If you experience drowsiness or dizziness, avoid these activities. Avoid alcohol while taking this medication. Alcohol will greatly increase the drowsiness and dizziness and could be dangerous.

---

**Caring for yourself at home**

**Symptoms to look out for**

**Call Physician for:**
The following are CONCERNING SYMPTOMS after an abdominoplasty.

PLEASE CALL YOUR DOCTOR IF:
* Temperature over 101\(^\circ\) F.
* Shortness of breath.
* Increasing pain or bleeding from the operative site.
* Severe or persistent diarrhea (from antibiotics).

---

**Activity**
The following are activity restrictions after an abdominoplasty.

* No heavy lifting for 4-6 weeks after surgery.
* Avoid sports and other strenuous activities except walking for at least 6 weeks after surgery.
* DO NOT SMOKE for at least 4 weeks after surgery, and avoid places where people do.
* Avoid direct exposure to the sun and do not use heat of any kind (heat lamp, heating pad, sauna, hot tub, tanning booth, etc.) for at least 12 weeks after your surgery.
### Treatments/ Wound Care and Special Instructions

The following are Incision Care instructions after an abdominoplasty.

- You may change the gauze under the binder as needed, but leave tapes alone until the first post-op visit.
- You may shower at 48 hours with your drains in place, just pat tapes dry.
- Wear the abdominal binder as much as possible the first 4 weeks.

### Supplemental Instructions

In addition, after an abdominoplasty:

**ON Q (PAIN BALL)**
Remove pain ball in 2-3 days after the surgery date. Place band-aid to site.

**EXERCISES**
Perform lower leg and calf exercises while you are in bed after surgery to decrease the risks of developing blood clots in your legs. Flex and point your feet, perform ankle rolls, bend and straighten your knees, etc.

### Nutrition

- **Cardiac Prudent Guidelines**
  - Enjoy fresh fruits and/or vegetables with every meal.
  - Choose high fiber foods such as whole wheat bread, brown rice, whole grain cereal, whole wheat pasta, corn, and beans.
  - Eat fish, chicken breast, turkey breast, or extra lean meat with your meals.
  - Bake, grill, or broil meat, fish, and poultry. Remove visible fat and skin.
  - Choose fat free or 1% milk and milk products.
  - Limit foods high in saturated fat, such as cheese, whole milk products, butter, gravy, and regular beef. Saturated fat can raise LDL (bad) cholesterol levels.
  - Try to avoid foods that contain trans fat, such as baked goods, fried food, snack foods, and stick margarine. Trans fat can raise LDL (bad) cholesterol levels and lower HDL (good) cholesterol levels.
  - Choose foods with healthy fat, such as olive oil, canola oil, fish, and nuts.
  - Use herbs and spices instead of salt to season food.
  - Limit high sodium foods such as frozen dinners, canned soup, ham, lunchmeat, hot dogs, bacon, sausage, and other processed meats.
  - Read food labels. Aim for less than 50-60 g fat per day and less than 600 mg sodium per meal.

Your doctor has placed you on this special diet. For a more personalized meal plan, you might want to follow-up with a Registered Dietitian (RD) who can help you meet your nutrition goals. Visit [www.eatright.org](http://www.eatright.org) or call 1-800-677-1600, ext. 5000 to locate an RD in your area.
Jefferson Cares About Your Health

Vaccine Assessment

Influenza Vaccine Given this Hospitalization: No

The influenza vaccine is given to reduce the risk of getting influenza (the flu). It is given yearly from October through March to patients based on their age or if they have certain health problems. Please follow up with your outpatient doctor to make sure you are up to date with your vaccinations. Influenza vaccination can be life saving.

Public Health Awareness

Jefferson cares about the overall health of you and your family. The following are important national public health priorities.

Tobacco: Smoking is a major cause of disease and premature death. If you smoke, stop smoking today to greatly reduce serious risk to your health. Secondhand smoke is also a concern since it can cause or worsen respiratory infections, asthma, heart disease and cancer. Resources are available to help you stop smoking. Please call the Smoking Cessation Program at the Center for Tobacco Research and Treatment at Thomas Jefferson by calling 215-955-7867. You can also contact the PA Quitline at 877-724-1090 for more information.

| Weight (kg): 76 | Weight (lbs.): 167.6 | Weight Date: 05/27/2010 | Height (cm): 152.4 | Height Date: 11/05/2009 | BMI (Body Mass Index): 32.7 |

BMI: The Body Mass Index (BMI) is calculated based on your weight and height. Overweight adults have a BMI between 25 and 29.9. Obese adults have a BMI greater than 30.

Weight Monitoring: Overweight and obesity are associated with heart disease, certain types of cancer, type 2 diabetes, stroke, arthritis, breathing problems (sleep apnea), and changes in mood, such as depression. Discuss with your doctor the types of physical activity you should do to control your weight. The best time to weigh yourself is in the morning before dressing and before breakfast. It should be done on the same scale (if possible) on a hard surface (for example, tile or wood, not carpet).

In particular, if you are a heart failure patient, weigh yourself and write down your weight every day. If your weight increases by 2 or 3 pounds or more over 1 to 2 days, or 4-5 pounds per week, please call your Doctor’s office.

Important Reminders

You were under the care of doctor Marvin V. Gozum. Please call this doctor’s office if you have any questions regarding your hospitalization or discharge instructions. Please call 215-955-6000 if you need assistance locating your doctor’s phone number.

It is very important that you schedule and complete any tests and appointments listed above immediately following your discharge from the hospital or as otherwise noted on this form. The results of these tests should be communicated to you by phone or letter within 7 days after the test has been completed. However, please contact your physician if you are not contacted with your test results within 7 days after the test has been completed and do not have a scheduled visit to review the test results.

Please bring this form to all follow-up appointments and if you go to any Emergency Department.

These discharge instructions have been explained to the Patient/Family. I have received and understood the above instructions.
APPENDIX D

HOME CARE NURSE INTERVIEWS
Home Care Nurse Interviews

1. What tasks / activities do you carry out during the initial home visit?
2. Is there a specific sequence to the tasks you perform?
3. What patient information do you need to perform the initial home visit?
4. Where do you get the patient information?
5. Is there patient information you need that you are currently not getting?
6. What data do you document during this process and where do you document (manual form, automated system)?

Home Care Nurse One

1. What tasks / activities do you carry out during the initial home visit?
   a. Get consent,
   b. Usually call the night before and ask for the client /family to have their d/c instructions and all their medications ready for the visit –
   c. Explain services provided – what home care nurse does, education, assess for changes in their condition, and make sure they’re scheduling follow-up doctor’s appointments.
   d. Suggest to them that when they schedule their follow-up appointments to let the receptionist know they were just discharged from the hospital and they need to be seen within 10 days.
e. Go over the medications – some prefer the discharge instruction sheet that is printed out – it has all the information needed – some like the home care RN to write out the medication list – RN offers this and some say yes. They have to ask the client if they want it written out separate from discharge instructions.

f. Ask client to explain in their own words - what happened in the hospital and why they need home care.

g. Medication education – dose frequency special instructions write out how many tabs to take – sometimes

h. Do assessment – blood pressure, heart rate, edema, GI

i. Scheduling of physician appointments – review the instructions.

j. Handout on low salt diet – etc.

k. Teaching on weight, diet, signs and symptoms, scale instruction and how to weigh – tele-monitoring nurse offer her services – home RN calls the tele nurse and leaves urgent message with client and episode number and heart failure and the client wants the telemetry RN. from the home care agency.

2. Is there a specific sequence to the tasks you perform?

   a. The first thing I do is explain what our agency is – must stress that home care nursing is not long term solution – this is a huge problem. They think home care RN should be there to care for skin problems.

   b. Then I follow the order as listed in the above question

3. What patient information do you need to perform the initial home visit?
a. Problem lists – some are very compliant when they go home – they want to learn about things they can do to prevent rehospitalization – like checking weight and diet, the hardest patients are the heart failure with diabetes, because they have so many restrictions – sugars that out of control, I think that the hardest thing is compliant and some could care less.

4. Where do you get the patient information?
   a. I get information from the referrals (entered in the home care system) and the discharge instructions (from the patient). The referral is ok – sometimes in addition to the standard data elements, we’ll get the client living situation (family supportive, housing situation, equipment in home, blood work that needs to be drawn).
   b. Client’s own story about what happened
   c. Home care system – if the patient was seen before by our agency

5. Is there patient information you need that you are currently not getting?
   a. Yes, sometimes all the client problems are not listed and we need to ask the patient or family
   b. Clinical reimbursement manager – is good at finding diagnoses
   c. The referrals are pretty accurate as far as what the client living situation is – one visit the family wrote down additional problems they have – nowhere in the referral did it say the patient smoked.
d. There are so many other factors and things going on in the home that the family might not think is a big deal but for us as nurses, it is a big deal. So the problems the other family members have are huge – i.e., someone who drinks and smokes around a client who has incisions that need to be healed. So the environment problem list and the problem list of family significant others.

6. What data do you document during this process and where do you document (manual form, automated system)?

a. For managed care – I put down diagnoses and secondary diagnoses related to primary – for instance chest pain, put CAD as primary and they put hypertension, high cholesterol, and Diabetes – I documented along with arthritis, I didn’t think arthritis was pertinent, taking no meds and no meds on the list so I didn’t think it was right to document this as problem. I’d put memory loss down as a diagnoses if it impacts their ability to manage their disease or condition or compliance.

b. There is a plan of care we send to the doctor and it goes over each system – teaching, cardiovascular, psychosocial, body systems, depression, and we go through and check off – take to what’s appropriate – and then we put in what we’re doing and send to the physician as a plan of care.

c. The goals are in the interventions and once that intervention is achieved and there is an achieved box.
When we open patients, there are guidelines, based on the problem they have. There are different interventions. Then track and if achieved, write a note describing how they achieved it.

**Home Care Nurse Two**

1. **What tasks / activities do you carry out during the initial home visit?**
   a. Explain consent form and have client sign
   b. Determine homebound status
   c. Review THCN packet of information
   d. Obtain discharge instructions from the hospital
   e. Confirm demographics, allergies, and emergency contact numbers
   f. Obtain pharmacy phone number
   g. Medication reconciliation
   h. Initial assessment including vital signs, Braden

2. **Is there a specific sequence to the tasks you perform?**
   a. The sequence varies, however I do try to follow the above outline of tasks. Sometimes the client wants to follow a different order of tasks so I take that into consideration as well. I do need the consent first, so even if the patient has their own order, they’re usually accommodating and sign the consent first.

3. **What patient information do you need to perform the initial home visit?**
   a. All diagnoses, vital signs, pain level, independence with activities of daily living, medications
4. Where do you get the patient information?
   a. Most of the information comes from the client, their family or caregivers
   b. The referral
   c. The discharge instructions which are intended for the client, not really the home care nurse because they’re in patient language, but they are very useful.

5. Is there patient information you need that you are currently not getting?
   a. Yes, client problems, however they are accessible if we ask them or they surface when we do an assessment

6. What data do you document during this process and where do you document (manual form, automated system)?
   a. Assessments, vitals, meds, problems, living situation, update physician contact information, orders, goals
   b. Some documentation is entered in the laptop during the visit, some is hand written to be entered later, and most is entered sitting on my couch at home

**Home Care Nurse Three**

1. What tasks / activities do you carry out during the initial home visit?
   a. Get consent signature
   b. Ask the client to explain the course of events that led to hospitalization
   c. Explain client rights and review the home care packet of information
   d. Validate homebound status
e. Get discharge instructions
f. Reconcile medications
g. Review follow-up appointments and transportation methods
h. Assess home environment to ensure safety
i. Review what to do in case of an emergency – who to call, etc.
j. Validate physician names, phone numbers and pharmacy phone number
   and patient /family phone number
k. Do an assessment
l. Create a problem list and goals for the next visit

2. Is there a specific sequence to the tasks you perform?
   a. Consent first, review discharge instructions, confirm medications, listen to
      patient concerns and find out what they expect of home care. It really
      depends on the client situation and what’s urgent or what’s bothering
      them, etc.

3. What patient information do you need to perform the initial home visit?
   a. Client problems, latest vital signs, ability to care for themselves, special
      things out of the ordinary that are important – like they forget things or
      they really can’t remember their meds

4. Where do you get the patient information?
   a. Well, the best information comes from the client or their family.
   b. Referral and discharge instructions – it tells me the medical reason and
      from that I can pretty much know what to do -
5. Is there patient information you need that you are currently not getting?
   a. Yes, issues related to memory or home situation or things they did in the hospital that didn’t work particularly around pain

6. What data do you document during this process and where do you document (manual form, automated system)?
   a. Medications and they take a long time – must enter them into the system, from the discharge instructions – sometime we find differences and then have to call the physician
   b. All the usual assessment stuff
   c. Plan stuff – what we’re going to do – goals for the next visit.

Home Care Nurse Four

1. What tasks / activities do you carry out during the initial home visit?
   a. Assess the home environment – is it safe, is there food, meds,
   b. Get consent signature
   d. Hand out the home care packet and go through the details
   e. Get discharge instructions
   f. Go through medications – this takes a long time and sometimes most of the first visit time. We enter them into the system, then write out a form for the client and then make sure the client knows what to take and when
   g. Follow-up appointments and transportation methods
   h. Do an assessment
   i. Make a list of all the problems
2. Is there a specific sequence to the tasks you perform?
   a. Consent, meds, phone numbers, assessment, teach, It can vary – I allow time at the end to make sure everything is done – and review with the client too.

3. What patient information do you need to perform the initial home visit?
   a. Everything is important -

4. Where do you get the patient information?
   a. Referral and discharge instructions
   b. Client or family

5. Is there patient information you need that you are currently not getting?
   a. Independence with doing things, problems with adls, we don’t get this information

6. What data do you document during this process and where do you document (manual form, automated system)?
   a. It’s all in the home care system, enter meds, assessments, mostly after the visit. I hate to be keying into the laptop in front of the patient.
APPENDIX E

COMMUNICATIONS USAGE DIAGRAM
## Table E1. Communications Usage Diagram

<table>
<thead>
<tr>
<th>Identification of Patient Post-discharge Needs</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Initiate inter-professional plan of care.</td>
<td></td>
</tr>
<tr>
<td>- Manual Documentation in the Patient Chart (medium) on the Inter-professional Plan of Care (IPOC artifact Form)</td>
<td>➕</td>
</tr>
<tr>
<td>- Impossible to assess the effect because the home care case managers do not view the inter-professional plan of care</td>
<td>➕</td>
</tr>
<tr>
<td>- Staff nurses were not interviewed because they are not part of the handoff process</td>
<td>➕</td>
</tr>
<tr>
<td>2. Document discharge planning as a focus of need on the inter-professional plan of care (RN responsible for patient and it is completed on admission)</td>
<td>➕</td>
</tr>
<tr>
<td>- Manual Documentation in the Patient Chart (medium) on the Inter-professional Plan of Care (IPOC artifact Form)</td>
<td>➕</td>
</tr>
<tr>
<td>- Impossible to assess the effect because the home care case managers do not view the inter-professional plan of care</td>
<td>➕</td>
</tr>
<tr>
<td>- Stated it was not necessary for acute-to-home care handoffs because the purpose is to maximize reimbursement and to ensure the home care services will be covered</td>
<td>➕</td>
</tr>
<tr>
<td>3. Educate patient on post-discharge planning needs</td>
<td>➕</td>
</tr>
<tr>
<td>- Manual Documentation in the Patient Chart (medium) in the Inter-professional</td>
<td>➕</td>
</tr>
<tr>
<td>- Impossible to assess the effect because the home care case managers do not view the inter-professional plan of care</td>
<td>➕</td>
</tr>
<tr>
<td>- Unable to assess. Home care case managers do not view the plan of care</td>
<td>➕</td>
</tr>
<tr>
<td>Patient RN for Patient</td>
<td>Hospital Case Manager</td>
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</tbody>
</table>

4. Review patient chart to identify post-discharge service(s) that best matches patient needs

- Patient Chart (manual and electronic medium)
- Medical History and Physical Note (artifact)
- Physician Progress Notes (artifact)
- Physician Orders (artifact)
- Physical Therapy Assessment Forms (artifact)
- Laboratory Results (artifact)
- Vital Signs (artifact)

**Home Care Case Manager Reported:**
- The physical chart is not organized well and it is hard to find information. For instance, the medical diagnoses are in multiple sections so gathering a complete list is difficult.

5. Case Management Rounds
Review patient progress, discuss post-discharge needs and discharge date, decide whether the patient needs home care services

- Manual Documentation on hand written notes (artifact)
- The inter-professional team was not interviewed.

**Home Care Case Manager Reported:**
- Complete electronic documentation with remote access
- Standards for the chart – standard places to put things like diagnoses

- The inter-professional team was not interviewed
<table>
<thead>
<tr>
<th>Patient RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Care Case Manager</th>
<th>Physical Therapist</th>
<th>MD</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact</th>
<th>Recommended Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
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<tr>
<td>6. Make a decision that the patient does or does not need home care (primarily driven by physical therapy who discusses the recommendation with the hospital case manager and physicians during the daily case management rounds)</td>
<td>• Face-to-face discussion</td>
<td>• The inter-professional team was not interviewed</td>
<td>• The inter-professional team was not interviewed</td>
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</tr>
<tr>
<td>7. Meet with patient and significant others to review clinical team post-discharge recommendations and to confirm patient preference for the Home Care Network</td>
<td>• Face-to-face discussion</td>
<td>• The hospital case manager was not interviewed</td>
<td>• The hospital case manager was not interviewed</td>
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<tr>
<td>8. Confirm insurance and prescription coverage</td>
<td>• Electronic Case Management System (artifacts)</td>
<td>• The hospital case manager was not interviewed</td>
<td>• The hospital case manager was not interviewed</td>
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<tr>
<td>Patient RN for Patient</td>
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<tr>
<td>9. Documents patient preference for the Home Care Network</td>
<td>• Manual entry in the progress notes (artifact) in the patient chart (medium)</td>
<td>• The hospital case manager was not interviewed.</td>
<td>• The hospital case manager was not interviewed.</td>
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</tr>
<tr>
<td>10. Initiates a referral to the home care case manager</td>
<td>• Electronic Case Management System (medium and artifact)</td>
<td>• The hospital case manager was not interviewed.</td>
<td>• The hospital case manager was not interviewed.</td>
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<tr>
<td>Home Care Case Manager Handoff Preparation</td>
<td>Home care case manager reported</td>
<td>Home care case manager reported</td>
<td>Home care case manager reported</td>
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<tr>
<td>11. Confirm that the Home Care Network has a contract with the patient’s insurance company</td>
<td>• Home care electronic system (medium and artifact)</td>
<td>• Effective, however use of multiple systems with redundant patient demographic data is inefficient</td>
<td>• Access to all systems from the hospital unit so the home care case manager doesn’t have to run between buildings for system access</td>
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</tr>
<tr>
<td>12. Review hospital case manager documentation indicating patient preference for the Home Care Network</td>
<td>• Patient chart (medium) – progress notes (artifact)</td>
<td>Home care case manager reported</td>
<td>Home care case manager reported</td>
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<tr>
<td></td>
<td>• Effective</td>
<td>• No recommendations</td>
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<tr>
<td>Patient RN for Patient</td>
<td>Hospital Care Case Manager</td>
<td>Home Care Case Manager</td>
<td>Physical Therapist MD</td>
<td>Home Care RN</td>
<td>Medium and Artifact Used</td>
<td>Effects of Medium and Artifact</td>
<td>Recommended Communication</td>
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</tbody>
</table>

13. Reviews the patient chart to assess appropriateness for home care

- Patient Chart (manual and electronic medium)
- Medical History and Physical (artifact)
- Physician Progress Notes (artifact)
- Physician Orders (artifact)
- Physical Therapy Assessment Forms (artifact)
- Laboratory Results (artifact)
- Vital Signs (artifact)

Researcher observation:
- The home care case manager does not access the online system to view nursing assessment charting (artifact) charting
- The home care case manager reported
  - The chart is not organized well, I have to review multiple sections just to find all the diagnoses and information needed for the home care referral.
  - The progress notes are manual and many times difficult to read
  - Finding the past medical history takes a long time because it’s all over the chart

- Automated chart with defined sections for everything such as patient problems.
- Ability to electronically quickly communicate with the hospital case manager to ask questions regarding the patient.
<table>
<thead>
<tr>
<th>Patient RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Care Case Manager</th>
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<th>MD</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact</th>
<th>Recommended Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>case manager just sees the electronic documentation that has been printed (physician orders and lab results artifacts)</td>
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<tr>
<td>• The home care case manager does not access the inter-professional plan of care including nursing diagnoses, interventions, and goals (artifacts)</td>
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<tr>
<td>• Sometimes the home care case manager had questions but could not find the hospital case manager (voice-to-voice medium)</td>
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</tbody>
</table>

14. Documents information needed for the referral while reviewing the patient chart to assess appropriateness for home care

- Reviews physical chart including manual documentation and printed electronic
- Home care case manager reported
  - It’s inefficient to write information down from one system and then
- Home care case manager reported
  - The ability to electronically generate a referral from the inpatient
<table>
<thead>
<tr>
<th>Patient RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Care Case Manager</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td>documentation that is placed in the chart (artifacts)</td>
<td>rekey the information into another system</td>
<td>EHR to the electronic home care system</td>
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</tr>
<tr>
<td></td>
<td>Manual writing of chart data on a sheet of paper (artifact) that eventually gets keyed into the home care system referral templates (artifact)</td>
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</tbody>
</table>

15. Confirm that the patient lives in the home care agency’s network service area.

<table>
<thead>
<tr>
<th>X</th>
<th>X</th>
<th>Home care case manager reported</th>
<th>Home care case manager reported</th>
</tr>
</thead>
</table>

16. Validate the patient’s decision to use the Home Care Network during a face-to-face meeting with the patient and/or significant other(S)

<table>
<thead>
<tr>
<th>X</th>
<th>X</th>
<th>Home care case manager reported</th>
<th>Home care case manager reported</th>
</tr>
</thead>
</table>

- *Face-to-face discussion*  
  - Effective  
  - No recommendations for change
<table>
<thead>
<tr>
<th></th>
<th>Patient RN for Patient Case Manager</th>
<th>Home Care Case Manager</th>
<th>Physical Therapist</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact</th>
<th>Recommended Communication</th>
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<tbody>
<tr>
<td>17. Confirm patient address and living arrangement, and levels of stories in the home</td>
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<td></td>
<td>• Face-to-face discussion</td>
<td>• Effective</td>
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<td>X</td>
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<td>Home care case manager reported</td>
</tr>
<tr>
<td>18. Educate patient and / or significant other(s) on the services provided by home care.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Face-to-face discussion</td>
<td>• Effective</td>
<td></td>
</tr>
<tr>
<td></td>
<td>X</td>
<td></td>
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<td></td>
<td>Home care case manager reported</td>
</tr>
<tr>
<td>19. Assess potential needs that were not included in the original referral</td>
<td></td>
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<td></td>
<td>• Face-to-face discussion with the patient</td>
<td>• “Sometimes while talking with the patient, I identify additional needs that the hospital case manager did not find. I would like to speak with the hospital case manager but I have no quick method for accessing them. Frequently I cannot find the individuals needed if the patient requires more than home care support.</td>
<td>• Electronic communication for quick access to all members of the clinical team</td>
</tr>
<tr>
<td>Patient RN for Patient</td>
<td>Hospital Case Manager</td>
<td>Home Care Case Manager</td>
<td>Physical Therapist</td>
<td>Home Care RN</td>
<td>Medium and Artifact Used</td>
<td>Effects of Medium and Artifact</td>
<td>Recommended Communication</td>
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</tr>
<tr>
<td>Home Care Case Manager Handoff to Home Care</td>
<td><strong>X</strong></td>
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</tbody>
</table>

20. Enters manual documentation (gathered from the inpatient record) into the electronic home care system – this creates the referral for the home care nurse

- Manual documentation (artifact)
- Electronic home care system (medium)
- Researcher observation: Home care case manager documentation is separate from acute care documentation (artifact)

- Redundant documentation using both a manual and electronic system
- Automation
- Integration between all systems for important data elements
- Methods to eliminate redundant documentation

21. Documents a note in the patient chart summarizing the above activities

- Manual documentation progress note (artifact)

- Effective

- No recommendations for change

22. Confirm insurance coverage, negotiate number of home visits with the insurance company

- Varies with insurance

- Home care case manager reported

- Home care case manager reported
### Discharge to Home

<table>
<thead>
<tr>
<th>Patient RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Care Case Manager</th>
<th>Physical Therapist</th>
<th>MD</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact</th>
<th>Recommended Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>company, some require a phone call, some are completely electronic</td>
<td>• Electronic home care system</td>
<td>• Effective</td>
</tr>
</tbody>
</table>

#### 23. Produce patient instruction discharge report

- Electronic patient record (medium) Discharge Instruction Report (artifact)
- No remote access
- Separate from nursing documentation
- Home Care Case Manager comment: It would be nice to put the documentation all in one place – nursing, medicine, etc.

#### 24. Confirm that the patient has discharge instructions, prescriptions and transportation home (HC case manager, primary care nurse)

- Face-to-face discussion
- There are separate activities, the home care case manager does this with the patient, if possible, and then the staff nurse does the same activity with the patient. It’s not very organized. Sometimes the order
- Better coordination to create a single encounter with the patient
<table>
<thead>
<tr>
<th>Patient RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Care Case Manager</th>
<th>Physical Therapist</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact Used</th>
<th>Recommended Communication</th>
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<tbody>
<tr>
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</tbody>
</table>

25. Complete nursing discharge summary (primary care nurse)

- Manual Documentation (medium) on the nursing discharge summary report (artifact)
- Research observation:
  - Separate from physician discharge summary and the patient instruction discharge report (artifacts)
  - Redundant documentation

- The staff nurses were not interviewed.

26. Complete medical discharge summary (physician)

- Dictated report (medium) that becomes the medical discharge summary (artifact)
- Separate from physician discharge summary and the patient instruction discharge report
  - Redundant

- Automation
- Integration between all systems for important data elements
- Methods to eliminate redundant
<table>
<thead>
<tr>
<th>Patient RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Care Case Manager</th>
<th>Physical Therapist</th>
<th>MD</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact Used</th>
<th>Recommended Communication Documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Home Visit</td>
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</tr>
<tr>
<td>27. Receives patient referral information (referral form)</td>
<td>X</td>
<td>Electronic home care system (medium) referral to home care form (artifact)</td>
<td>Effective but not complete</td>
<td>There is missing information that we discover during the initial home visit</td>
<td>Also there are missing problems and sometimes problems the patient has that are not on the referral form.</td>
<td>Remote access (for home care nurse)</td>
<td>It would be nice to see all the patient problems.</td>
<td>Redundant documentation of the medications from the hard copy report into the home health system is a waste of time. It would be nice to have the medications automatically show up in the home care system. We spend most of the initial visit doing medication reconciliation.</td>
</tr>
<tr>
<td>Patient RN for Patient</td>
<td>Hospital Case Care Manager</td>
<td>Home Care Case Manager</td>
<td>Physical Therapist</td>
<td>Home Care RN</td>
<td>Medium and Artifact Used</td>
<td>Effects of Medium and Artifact</td>
<td>Recommended Communication</td>
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</tr>
<tr>
<td>We ask the patient for the discharge instructions and they are extremely helpful. However, we have to re-enter the information into the home care system and it's a waste of time. Why can't we access the inpatient discharge documentation from the patient home?</td>
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<tr>
<td>Interface data into the home care system so we don't have to re-enter it. This would get rid of redundant documentation</td>
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</tbody>
</table>

28. Schedules patient visit

- Phone (medium), and home care system form with scheduled date (artifact)
- Effective

- Remote access (for home care nurse)
- It would be nice to see all the patient problems.
- Redundant documentation of the medications from the hard copy
A report into the home health system is a waste of time. It would be nice to have the medications automatically show up in the home care system. We spend most of the initial visit doing medication reconciliation. Reports into the electronic home care system and this is helpful but there is other information needed which we do not get. We ask the patient for the discharge instructions and they are extremely helpful. However, we have to re-enter the information into the home care system and it’s a waste of time. Why can’t we access the inpatient discharge documentation from the patient home?
<table>
<thead>
<tr>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact Used</th>
<th>Recommended Communication to Re-enter it.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Care Nurse Reported</td>
<td>Home Care Nurse Reported (hand copy artifact)</td>
<td>Remote access (for home care nurse)</td>
</tr>
<tr>
<td>- Errors in data - the information doesn't align with what the nurse is seeing during the visit</td>
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<tr>
<td>- Redundant documentation of medications from the hard copy report into the home health system is a waste of time.</td>
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<tr>
<td>- This would get rid of redundant documentation.</td>
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</tbody>
</table>

- We get the referral form in the electronic home care system and this is helpful, but there is redundant documentation.

29. Receive patient Discharge Instructions Report (patient gives hard copy to home care nurse)
other information needed which we do not get. We ask the patient for the discharge instructions and they are extremely helpful. However, we have to re-enter the information into the home care system and it’s a waste of time. Why can’t we access the inpatient discharge documentation from the patient home?

- Interface data into the home care system so we don’t have to re-enter it. This would get rid of redundant documentation

X

30. Document patient Discharge Instructions Report in home care system (home care nurse)

- Electronic home care system (medium) documentation templates (artifact)
- RN must rekey important data elements into the electronic home care system
- If there are errors in data - the information fails to
- Remote access (for home care nurse)
- It would be nice to see all the patient problems.
- Redundant documentation of the
<table>
<thead>
<tr>
<th>Patient</th>
<th>RN for Patient</th>
<th>Hospital Case Manager</th>
<th>Home Case Manager</th>
<th>Physical Therapist</th>
<th>MD</th>
<th>Home Care RN</th>
<th>Medium and Artifact Used</th>
<th>Effects of Medium and Artifact</th>
<th>Recommended Communication</th>
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<td>align with what the nurse is seeing during the visit</td>
<td>medications from the hard copy report into the home health system is a waste of time. It would be nice to have the medications automatically show up in the home care system. We spend most of the initial visit doing medication reconciliation.</td>
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<td></td>
<td>• Inability to see inpatient record to reconcile data</td>
<td>• We get the referral form in the electronic home care system and this is helpful but there is other information needed which we do not get. We ask the patient for the discharge instructions and they are extremely helpful. However, we have to re-enter the information into the home care system and it’s a waste of time. Why can’t we access the inpatient discharge documentation from the patient home?</td>
</tr>
<tr>
<td>Patient RN for Patient</td>
<td>Hospital Case Manager</td>
<td>Home Care Case Manager</td>
<td>Physical Therapist</td>
<td>Home Care MD RN</td>
<td>Medium and Artifact Used</td>
<td>Effects of Medium and Artifact</td>
<td>Recommended Communication</td>
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</tbody>
</table>

- Interface data into the home care system so we don’t have to re-enter it. This would get rid of redundant documentation.
REFERENCE LIST


Kaiser Permanente (2007). Clinical Excellence Nurse Knowledge Exchange. [Newsletter Educational]. *KP News Center, N/A(N/A), N/A.*


VITA

Rosemary Kennedy was born and raised in Philadelphia, Pennsylvania. Before attending Loyola University Chicago, she attended Widener University, Chester, Pennsylvania, where she earned a Bachelor of Science in Nursing and a Master’s in Business Administration.

Rosemary holds many leadership roles through her work with the American Medical Informatics Association (AMIA), Technology Informatics Guiding Educational Reform Board (TIGER) and previously, the International Medical Informatics Association (IMIA). She is widely presented and published in the field of nursing informatics, clinical documentation and terminology standards. She is a fellow in the American Academy of Nursing and received the HIMSS 2008 Nursing Informatics Award as well as the top 25 women in healthcare award for 2009. For many years, she was the Chief Nursing Informatics Officer for Siemens Healthcare Solutions where she provided professional practice leadership over the development and deployment of solutions to ensure nursing practice and interdisciplinary requirements were met. In 2010, Rosemary was inducted into Alpha Sigma Nu National Honor Society.

Currently, Rosemary is Associate Professor at Thomas Jefferson University School of Nursing in Philadelphia and is Vice President of Health Information Technology for the National Quality Forum in Washington, DC.