Home Care Admission Information: What Nurses Need and What Nurses Have. A Mixed Methods Study

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Abstract

Effective communication between clinicians across care settings is fundamental for continuity of care and decreased risk of errors. The home care admission often starts without important information needed for formulation of the plan of care. We conducted a mixed methods analysis to investigate home care admission information from two perspectives: qualitative information regarding information nurses reported they needed during an admission, and quantitative information regarding information actually available. We mapped both data sets to an international specification for transitions in care information, the Continuity of Care Document (CCD). The information that homecare nurses said they needed mapped sufficiently (90%) to the CCD. Regarding available information: no observation had all the CCD information present; CCD information was missing in varying amounts across the admission documents. Nurses searching among pages of documentation for information which may not be present is inefficient and introduces patient safety concerns of increased risk for errors.

Keywords: Communication; Home Care Services; Continuity of Patient Care/standards; Nursing Informatics.

Introduction

Effective communication between clinicians across care settings is fundamental to continuity of care.[1; 8; 10; 19] However poor communication of patient information is acknowledged to be a root cause of sentinel events.[3; 19] Thus standardized procedures for this communication is a Joint Commission requirement for accredited institutions. [19] The Continuity of Care Document (CCD), which complies with the ASTM E2369-05 Standard Specification for Continuity of Care Record (CCR) [7] promotes communication and interoperability of clinical data by summarizing and categorizing patient summary information useful for transitions. The CCD can be shared by hospitals, skilled nursing facilities (SNF), and other health related institutions as patients transition between settings. It is a Health Level 7 (HL-7) Clinical Document Architecture exchange standard meant to improve the effectiveness and efficiency of distributing electronic health documents.

The ASTM CCR is an electronic document exchange standard developed by health care practitioners to accommodate the needs of physicians.[5] The CCR is organized into three main areas: header, body, and footer. The body contains patient-specific data including medications, problems, and procedures. Data are organized into 12 sections reflecting common clinical conventions. For example, the details of a patient's family history would be discussed under the "Family History" heading. Within each section are numerous CONF codes (terminology

conformance constraints), each of which specifies a data element (e.g., 119-Patient Caregiver).

For older people who transition from hospital to home, home care is an effective way of assisting patients and caregivers to manage chronic illness with skilled nursing care in the home. However, the transfer of information during the care-setting transition, handoff, or handover is often sparse.[17] The home care admission often starts without important information needed for formulation of the plan of care.[3] Studies have found deficits in information transfer to home care agencies. In the US, a field study of information received on admission for older heart failure and diabetes patients, found between 7% (laboratory results) and 90% (medications) of information was lacking.[3] A recent qualitative study identified information deficits related to medications, and cognitive and behavioral health information.[9] To address this information deficit, nurses tend to rely on the patient for the missing information, which is often wrong or misunderstood by the patient.[15] Qualitative Nordic studies have found information deficits on admission related to insufficient information about medications, [2; 4; 6; 14] previous illness, and care needs. [11] From a human information processing perspective, adequate and accurate information is the basis for making subsequent judgment and appropriate clinical decisions, [20] and providing safe patient care.[16]

This paper presents quantitative findings from a mixed methods field study of the availability of transitions in care information to home care admission nurses at the point of care. This investigation is part of a larger study to characterize these nurses' practices at the point of care. Our goal is to develop recommendations to enhance the home care admission process and to inform health information technology standards for home health agency electronic health record (EHR) systems.

Methods

The research team investigated home care admission information from two perspectives: a) focus group data consisting of nurses' statements about information needed during a home care admission, and b) information available to nurses during the admission. The Drexel University IRB approved this study.

Setting

The research site was a rural Pennsylvania home care agency. The nurses used a point-of-care EHR. The agency was reimbursed for the nurses' time. All nurses volunteered for the study and provided consent. When nurses were observed in the home, the patients provided consent.

Data Collection

Needed Admission Information

During a focus group session (led by KB), six nurses who admit patients to home care provided the information <u>needed</u> to make clinical decisions related to the admission. The nurses were asked about four important decisions: 1) medication reconciliation, 2) plan of care, 3) future visit patterns, and 4) the inclusion of other disciplines.

Available Admission Documents

Researchers (EB, PS, SP) collected data on what information was <u>available</u> for 12 admissions by observing six nurses each admit two patients. During the approximately 1-hour admission visits, nurses conducted and documented a patient assessment, and documented the plan of care and interventions performed.

The research team collected copies of documents that were available at the start of the admission: Referral, Intake, and Discharge Summary/Progress Note ('Discharge Summary'). Referral documents were from the patient's previous clinical setting (e.g., hospital, SNF, physician office). There was no standardization across referral sources as to the forms sent to the agency, nor what data were contained. The documents were faxed to the agency, printed, and given to the nurse.

The Intake document was a standardized form completed by the home care intake nurse who received information about the patient from the referral site. The form was intended to assure that the patient was eligible for care and had insurance. Six of the 56 fields on the form contained clinical information (i.e., diagnosis, order, disciplines requested, activity level/weight bearing status, vaccinations). An intake nurse handwrote information on the form during a telephone call with the referral site. The completed form was given to the admission nurse.

The Discharge Summary or Progress Note was a document from the hospital or SNF, or from the physician office, respectively, with instructions given to the patient for reference. Here, Discharge Summary is interchangeable with discharge instructions. There was no standardization across referral sources as to data on the form. The nurse could ask the patient or caregiver for the document while in the patient's home.

The team used a checklist to ensure all documents were collected and returned to the agency to request missing documents. Documents dated after the admission visit date were not retained, as the document would not have been available to the nurse during the admission.

CCD- CONF Codes

Three researchers (SP, PS, CW) reviewed the HL7 Implementation Guide for the CCD document^[7] to identify relevant CCD data elements, designated as 'CONF' (conformance) codes. Within the CCR Body Representation section of the Guide, the 17 subsections related to clinical information were reviewed to identify at least 1 representative CONF code per section. CONF codes which described clinical information related to a current episode were the focus of the review. Clinical information related to previous episodes (e.g., past medications) were excluded. The strategy was to select the more general applicable CONF code and to select multiple CONF codes if those codes conveyed additional clinical information. For example, in subsection 3.3 Support, the researchers identified four unique clinical information concepts: 108-Patient Guardian; 110-Next of Kin; 115-Emergency Contact; 119-Patient Caregivers.

Data Analysis

To categorize and organize the information as data elements, we referred to the CCD description of the data elements. Information was organized in an Excel spreadsheet and reviewed by the research team. The Needed Admission Information data were qualitatively analyzed. The Available Admission Documents data were quantitatively analyzed. The qualitative and quantitative data were brought together at the CCD code level for the mixed methods analysis.

Needed Admission Information

The authors (SP, PS) sought to match each information theme to the single CONF code whose description was the best match to the concept in the information theme. SP selected the CONF code for each information theme. She referred themes that matched more than one CONF code to PS to identify the best match. SP reviewed the CONF codes PS selected. The information themes and CONF codes matches/mismatches were documented in the Excel spreadsheet.

Available Admission Documents

An analyst (CW) searched each page of the retained Referral, Intake, and Discharge documents for clinical information related to the 22 CONF codes of interest as shown in Table 1. As the analyst read each page of a document, she noted the presence of data related to a CONF code in an Excel spreadsheet and recorded the page number (if relevant) on which the data were found. For example, 123 Functional Status included seven dimensions (i.e., patient's ambulatory ability, mental status or competency, home or living situation, activities of daily living (ADLs), occupational activity, communication activity, and perception activity which included sight, hearing, taste, skin sensation, kinesthetic sense, proprioception, and balance.) If none of these dimensions were found, CW documented "No" in the Excel spreadsheet. If any of the data were present, she noted the page number(s). CW calculated the frequency of occurrence of data related to each CONF code in the three types of documents across the 12 observations. PS and SP reviewed the analysis.

CW recorded the specific day of the week of the admission as documented on the Intake document. The rationale was that the office staff and intake nurse were not scheduled to be at work during the weekends and would not be present to gather the documents. Staff absence could result in fewer documents being available to the admission nurse during the weekend.

Results

Needed Information Themes

The 51 information themes elicited from the focus group responses were distributed among 6 groups of themes. The largest group was the 25 themes related to the Patient (e.g., diagnosis, level of knowledge, physical findings, level of function, goals, care needs). The second largest group was Medication and Medication Self-Management, with 10 themes (e.g., high risk medication, patient ability to understand medications, medication list availability). The group, External Resources, also had 10 themes (e.g., insurance approval and requirements, recommendations from referral source, availability of equipment). The Home Care Agency group had 4 themes (e.g., care the admission nurse would provide, resources available from the agency). Two groups each had 1 theme: Care Giver availability, and Home Environment condition (e.g., cluttered).

Needed Admission Information

Six of the 22 CCD codes (27%) did not match the information themes mentioned in the focus group. Three unmatched CCD codes were related to the patient's sources of support: #108 Patient Guardian, 110-Next of Kin, and 115-Emergency Contact. However, the related CCD code, 119-Patient Caregivers, did match an information theme, Assistance in

home. A fourth unmatched CCD code was 184-Family History. The fifth unmatched CCD code was 304-Medication Activity. However, the related 299 Medication, did match a number of information themes. The sixth unmatched CCD code was 316-Supply Activity.

Conversely, 5 of the 51 information themes (10%) did not match a CCD code. Three unmatched themes were related to patient behavior during a clinical visit: Patient is chatty; Patient states the nurse use of the computer takes away the nurse's attention; Typing makes the patient anxious. The fourth unmatched information theme referred to availability of a document – the discharge instructions (Discharge Summary), and did not refer to a piece of information. The fifth unmatched information theme was Availability of services, which refers to agency and community services, and does not refer to patient information.

Available Admission Documents

For each type of document the lack of associated CCD codes varied across observations (Table 1). Referral documents had the lowest percentage of missing CCD codes with a median of 38%. The highest percentage of missing codes was among Intake documents with on average 77% of CCD codes missing. Among the observations that were available and had legible Discharge Summary (58%), the median for missing CCD codes was 70%. Regarding the 42% of Discharge Summary that were not available, four documents were missing (the nurse did not ask for the document in the patient home or the document was not available in the home), and one document was illegible. There was no pattern to missing documents that corresponded with weekday or weekend admissions.

No observation had all CCD codes present, as three CCD codes (14%) were missing on all documents. These codes were related to the patient's sources of support: 108-Patient Guardian, 110-Next of Kin, and 119-Patient Caregivers. However, the related CCD code, 115-Emergency Contact, was present on a document in 83% of observations.

Five CCD codes (23%) matched fields on the Intake form: 30-Payer, 140-Problems, 453-Encounters, 480-Plan of Care, 492-Healthcare Providers. Of the five CCD codes, all except 30-Payer were present on all three types of documents.

Four CCD codes (18%) occurred only in the Referral documents. However, these CCD codes were not uniformly present in them. 86-Advance Directive Observation was present in 25% of Referral documents. 184-Family History and 232-Social History were each present in 83%. 388-Results was present in 67% of Referral documents.

The remaining 10 CCD codes (45%) tended to occur in the Referral documents (median 67%), occurred less frequently in the Discharge Summary (median 33%), and did not occur in the Intake document. The 10 CCD codes had varying degrees of missingness in the documents. 299-Medications and 316-Supply Activity were the most present, each present in 92% of the Referral documents and in 83% of the available and legible Discharge Summary. In the middle of the range, 123-Functional Status was present in 67% of the Referral documents and in 17% of the available and legible Discharge Summaries. Although it was a field on the Intake form, it was not completed. The CCD codes that were least available were 371-Medical Equipment which was present in 8% of the Referral documents and in 33% of the available and legible Discharge Summaries; and 376-Immunization was present in 17% of the Referral documents, and in the 17% of the available and legible Discharge Summaries.

Discussion

Our investigation of information that homecare nurses said they <u>needed</u> during an admission found that, overall, the CCD captured this information. Our examination of information that homecare nurses actually had <u>available</u> during the admission found that universally, the admission documents omitted CCD information. These findings have implications for standardization of transitions-in-care information flow.

Our finding about the information nurses said they needed indicates that the CCD is sufficiently complete with regards to information to be communicated during a transition in care to a home care agency. We use the qualifier 'sufficiently' to clarify that unmatched information themes were not related to clinical care information.

The available admission documents during the admission included two non-standardized documents: the Discharge Summary and the Referral. These documents had varying number of pages and varying missingness of CCD-related information. The Discharge Summary could be entirely missing or illegible. The document could be missing either because the nurse did not ask the patient for it or because the patient could not produce it. If the document was handwritten, it could be illegible. The highest presence of CCD-related information occurred in Referral documents. Important information, including Social History and Results, occurred only in the these documents. However, the Referral documents can be many pages for a nurse to peruse during the time constrained admission visit. The third type of admission document was the Intake form. This form was standardized, contained few, although important (e.g., Problem, Plan of Care, Activity level), information to be communicated to the admitting nurse for patient care. However, not all patient care fields were routinely completed (i.e., Activity level). The incongruence of information across information sources raises the question of where do nurses look for information they need? The lack of standardization of information availability forces nurses to search for information in multiple places and through pages of documents while under time constraints, which is not an efficient use of nurses' time and adds to their cognitive load (mental effort used in working memory).

Nurses looking through these documents would have been unable to find all the information they needed, as no admission had all the information nurses said they needed, nor all the CCD-related information in the admission documents. Some important information was available for all admissions, although the document(s) that contained the information varied. Available information included the Problem List and the Plan of Care. The latter is required for admission as it contains the physician orders. Both information were fields on the Intake form. In contrast, Social History and Medication information were not universally available. Social History, which may include behavioral information, occurred only in the Referral document. Having behavioral information is important for the safety of the nurse and to plan the approach for teaching selfcare management. The absence of consistent or accurate medication information prevents the nurse from performing the required medication reconciliation, and from assessing patient medication self-management capability. In addition, a medication list can indicate the patient's medical conditions which the nurse could use if a problem list was not present. The lack of a medication list denies the nurse from having a second source for gleening patient problems. Medication information sporadically occurred in two document types which raises the question: Among the documents available to the admitting nurse, what is the medication list source of truth? This dangerous situation could lead to adverse medication related events.

A nurse searching among pages of documentation for information which may not be present introduces patient safety concerns of increased risk of errors. Patient outcomes and quality of care may be impacted by the quality and amount of information available to clinicians.[8, 13; 18] Thus, the need for interoperability and standardization of transitions-in-care information transmittal methods and clinical information content. This need for has been realized in Norway with point-of-care EHRs interoperable from physician to home care.[12] In contrast, study nurses lacking this functionality sorted through paper documents under time constraints during the admission. A strength of the study is the research design. We conducted a field study to collect both qualitative and quantitative data and conducted a mixed methods analysis to produce quantitative findings. However, the sample and setting are limitations of the study. Six nurses who participated in the focus group and documentation from 12 admissions were from one home health agency using one EHR. To enhance research transferability, future work will add observations at different agencies, with different nurse and patient populations, and different EHRs.

Table 1. Occurrence of CCD CONF Codes Among Ty	vpes of Admission Documents and CONF	Code Match to Information Theme
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CONF Code	Referral	Intake	Discharge	Needed Information Theme Match to CONF
	N=12	N=12	N=8	Code
CONF 30-Payer	8 (67%)	12 (100%)	0 (0%)	Insurance coverage
CONF 86-Advance Directive	3 (25%)	0 (0%)	0 (0%)	Full Code or DNR (code status)
CONF 108-Patient Guardian	0 (0%)	0 (0%)	0 (0%)	UNMATCHED
CONF 110-Next Of Kin	0 (0%)	0 (0%)	0 (0%)	UNMATCHED
CONF 115-Emergency Contact	8 (67%)	4 (33%)	0 (0%)	UNMATCHED
CONF 119-Patient Caregivers	0 (0%)	0 (0%)	0 (0%)	Assistance in home (family)
CONF 123-Functional Status	8 (67%)	0 (0%)	2 (25%)	Patient doesn't understand med info over phone
				Patient can't take medications as prescribed
				Not taking meds/patient medication compliance
				Cognitive ability
				Level of knowledge (about disease)
				OASIS SOC (Start of Care)
				Patient compliance
				Patient at baseline function
				ADL Status
				Medication self-admin
CONT. ((0. D. 11)	11 (000)	11 (000)	4 (500)	Home environment (if home dirty/cluttered)
CONF 140-Problems	11 (92%)	11 (92%)	4 (50%)	End stage disease process
				Diagnosis (recent, dx list)
				Pre-hosp, health baseline
				Health history (diseases/freq. MD visits)
CONF 194 Forsile History	10 (920/)	0 (00/)	0 (00/)	Admission indication./discharge reason
CONF 184-Family History	10 (83%)	0 (0%)	0(0%)	UNMATCHED OASIS SOC
CONF 232-Social History	10 (83%)	0 (0%)	1 (13%)	UASIS SOC
CONF 257 Allereite	11 (020/)	0 (00/)	5 ((20/)	
CONF 257-Allergies	11 (92%)	0 (0%)	5 (63%)	
CONE 200 Madiantians	11 (029/)	0 (09/)	6 (759/)	Wedministration route
CONF 299-Medications	11 (92%)	0 (0%)	0(73%)	I'v administration route
				Medication frequency
				Medication list accurate meds
				New medication
				Correct meds in home
				High risk meds
CONF 304-Medication Activity	9 (75%)	0 (0%)	6 (75%)	UNMATCHED
CONF 316-Supply Activity	9 (75%)	0 (0%)	5 (63%)	UNMATCHED
CONF 371-Medical Equipment	1 (8.3%)	0 (0%)	3 (38%)	OASIS SOC
1. <u>1</u> . <u>1</u> .	(. ()	- ()	Equipment Needs
CONF 376-Immunization	2 (17%)	0 (0%)	2 (25%)	OASIS SOC
CONF 381-Vital Signs	8 (67%)	0 (0%)	2 (25%)	OASIS SOC
8	` ,	, ,	. ,	Physical assessment
CONF 388-Results	8 (67%)	0 (0%)	1 (13%)	Imaging results
	Ì, í	Ì, í	, í	Lab work results
CONF 422-Procedures	7 (58%)	0 (0%)	2 (25%)	Procedure reports
CONF 453-Encounters	8 (67%)	12 (100%)	6 (75%)	Goals from palliative care
		, í		In hospice program
				OASIS SOC
				Amount previous teaching received
				Rehospitalization

	1			
CONF 480-Plan Of Care	100%	12 (100%)	6 (75%)	Patient desired outcomes (palliative/hospice)
				OASIS SOC
				What we're to perform
				Nursing frequency
				Community resource needs
				Recommendations from referral
				Lab work needed
				Other therapies needed
				Upcoming medical appointments
				Teaching needs (meds, what will teach)
CONF 492-Healthcare Providers	9 (75%)	12 (100%)	6 (75%)	OASIS SOC

Conclusions

In this mixed methods field study we investigated the availability of transitions in care information for nurses during the home care admission. We found that the CCD sufficiently covered information that nurses needed. We also found that, uniformly, not all the information nurses needed was in the documents available at admission. These documents were characterized by a lack of standardization, varied amounts of missingness of information, and many pages to peruse. These characteristics likely increase nurse mental effort and decrease nurse efficiency. Coupled with inadequate information, these conditions may impact the nurse's ability to make appropriate clinical decisions, and increases risk to patient care. We suggest that an interoperable point-of-care EHR capable of communication of standardized transitions in care information (e.g., CCD) is needed to support continuity of care.

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