BMJ Open

Protocol to describe the analysis of text-based communication in medical records for patients discharged from intensive care to hospital ward

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To cite: Parsons Leigh J, Brown K, Buchner D, *et al*. Protocol to describe the analysis of text-based communication in medical records for patients discharged from intensive care to hospital ward. *BMJ Open* 2016;**6**:e012200. doi:10.1136/bmjopen-2016-012200

▸ Prepublication history and additional material is available. To view please visit the journal (http://dx.doi.org/10.1136/bmjopen-2016-012200).

Received 8 April 2016
Revised 7 June 2016
Accepted 14 June 2016

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ABSTRACT

Introduction: Effective communication during hospital transitions of patient care is fundamental to ensuring patient safety and continuity of quality care. This study will describe text-based communication included in patient medical records before, during and after patient transfer from the intensive care unit (ICU) to a hospital ward (n=10 days) by documenting (1) the structure and focus of physician progress notes within and between medical specialties, (2) the organisation of subjective and objective information, including the location and accessibility of patient data and whether/how this changes during the hospital stay and (3) missing, illegible and erroneous information.

Methods: This study is part of a larger mixed methods prospective observational study of ICU to hospital ward transfer practices in 10 ICUs across Canada. Medical records will be collected and photocopied for each consenting patient for a period of up to 10 consecutive days, including the final 2 days in the ICU, the day of transfer and the first 7 days on the ward (n=10 days). Textual analysis of medical record data will be completed by 2 independent reviewers to describe communication between stakeholders involved in ICU transfer.

Ethics and dissemination: Research ethics board approval has been obtained at all study sites, including the coordinating study centre (which covers 4 Calgary-based sites; UofC REB 13-0021) and 6 additional study sites (UofA Pro00050646; UBC PHC Hi4-01667; Sunnybrook 336-2014; QCH 20140345-01H; Sherbrooke 14-172; Laval 2015-2171). Findings from this study will inform the development of an evidence-based tool that will be used to systematically analyse the series of notes in a patient's medical record.

Strengths and limitations of this study

- Data will be collected from 10 sites (7 cities, four provinces) across Canada.
- Data analysis will inform the development of a tool that has been designed with the intent to improve communication in the ICU to hospital ward transfer process.
- Strong potential to improve the continuity of care plans.
- Applicability to electronic medical records will not be evaluated.
- Results may not be generalisable to hospitals in different health jurisdictions.

INTRODUCTION

High-quality communication between healthcare providers is essential for effective coordination of patient care from hospital admission through to hospital discharge.[1] However, patterns of communication between multiprofessional providers are often complex and transpire through various forms including face to face, textual (paper based and electronic) and over the phone communication.[2] The risk of communication failures is high, with one in two patients experiencing a breakdown in communication during their hospital length of stay.[3 4] Such breakdowns are associated with reduced quality of patient care, increased preventable medical errors[3] and adverse events,[4] and patient and family members who are dissatisfied with the quality of care.[5]

This study will describe and evaluate text-based communication during patient transfer from ICU to hospital ward. Specifically, we will analyse clinical notes and transfer tools documented in patient medical records for up to 10 calendar days, including 2 days before ICU to hospital ward transfer, the day of transfer and up to 7 days after the transfer depending on patient length of hospital stay. For the purposes of this study, we define 'medical record' as the record of a patient's medical information (eg, history, care or treatments received, test results, diagnoses, and medications taken, admission and discharge summaries, etc). To ensure the feasibility of the study, we have restricted our focus to physician notes (admission, progress,

consultation and discharge). The goal of this study was to describe the content and structure of text-based patient medical records during patient transfer from ICU to hospital ward. Results will shed light on the nature of text-based communication between providers during ICU to hospital ward transitions and what might be done to improve it.

Communication during hospital transitions of care

Hospital transitions of care (ie, patients moving from one provider to another or one care location to another) are periods in healthcare delivery that are particularly vulnerable to breakdowns in communication. In particular, the transfer of patients between healthcare teams can lead to the transmission of fragmented information and low-quality patient care.[6] Patient transfer from the ICU to hospital ward is a challenging and high-risk transition of care as the sickest patients with the most complex needs move from a high-intensity care environment to an environment[7] with far fewer resources. During this transition, patient information must undergo a multiprofessional (ie, nurse to nurse, physician to physician) and multispecialty (ie, ICU provider to ward provider) transition. Additionally, differences between ICU and hospital ward settings and differences in clinical focus between professions and specialties[8–10] are linked to poor communication that causes confusion about care plans[11–13] and patient conditions,[14] decisions that are based on inaccurate or incomplete information,[15] redundant testing and treatments[16] and medication errors[3] in the ICU to ward transfer process.

Text-based communication

A patient's medical record performs a vital function in maintaining continuity of care across the healthcare continuum because it is the central mechanism within which textual communication between providers is recorded.[17] In addition, a patient can experience numerous instances of provider handover during their hospital length of stay, but the documentation included in the medical record stays with the patient as an objectified representation of their history (eg, medications prescribed), daily goals of care and treatment plan.[18] When patients are unable to speak or advocate for themselves —as is common with many ICU patients—the medical record is even more crucial because it stands in for the 'patient's story'.[19 20] While the significance of effective provider communication to patient safety and the provision of quality care have been well documented,[5 21 22] less is known about the effectiveness of textual communication in coordinating high-quality care during patient transitions from the ICU to a hospital ward,[8] and few tools exist to evaluate this.[23]

Physician progress notes

Medical records are an important source of patient information and often contain handwritten or typed physician progress notes and document provider assessments, investigations, current problem lists and management strategies.[24] Consistency in the structure and style of progress notes included in the medical record is associated with ease and efficiency of provider review, including the timely identification of key facts that are pivotal to patient care and planning processes.[25] However, anecdotal evidence suggests that physicians with different clinical backgrounds (ie, specialties) often take differing approaches to medical record documentation,[8] leading to breakdowns in communications, discrepancies in patient care, treatment errors, conflicting decision-making and a lower quality of care.[26–28] There is a dearth of information about how physicians with different clinical backgrounds provide written documentation in patient medical records. To the best of our knowledge, no tools are currently available to measure these particular discrepancies.

Standardisation in clinical note taking

Efforts to standardise clinical note taking have been made to improve consistency and communication.[25] In particular, widely accepted criteria for clinical progress note entries is that the note should contain the patient's name, hospital identification number, date, time and also the name and designation of the physician who is entering the notation.[29] In addition, entries should be presented in chronological order to reflect a continuum of patient care and entries should occur immediately following an event.[29] A prominent strategy for progress note documentation follows the subjective, objective, assessment and plan (SOAP) structure.[30 31] This structure advocates for a problem-oriented medical record (POMR)[30] and has been implemented in a range of hospital settings.[31 32] It has been demonstrated that the use of the SOAP structure leads to more consistent and reliable documentation of physician progress notes,[30] which can enhance communication between providers[28 32] and bolster trainee education initiatives.[33] However, the SOAP format has been criticised for failing to take the experiences and observations of patients and families into account.[34] Furthermore, comorbidities and complications are poorly documented when the SOAP structure is followed without a template to prompt their input.[35]

We propose a descriptive textual analysis study to describe text-based communication included in patient medical records before, during and after patient transfer from the ICU to medical ward. We will collect and analyse information that describes the content and structure of physician progress notes within and between medical specialties, the organisation of subjective and objective information, as well as missing, illegible and erroneous information included in the medical record. Data analysis will identify opportunities to improve communication during the ICU to hospital ward transfer process and support the development of an ICU transfer toolkit.

OBJECTIVES

Overarching objective

To describe communication content and structure during transfer from ICU to hospital ward as depicted in patients' medical records.

Specific objectives

1. Establish chart organisation and identify similarities and differences in charting across specialties and units.
2. Describe how the medical record is used by providers (ie, how medication information is stored, how often previous notes are referred to, type of progress note written, etc) in the ICU to ward transfer process to improve overall usability and effectiveness of the medical record.
3. Determine where breaks in communication and/or the loss of information occur in the medical record and the impact this has on patient care following transfer from the ICU to hospital ward.

METHODS/DESIGN

Study design

We propose to conduct a textual analysis of patient medical records that have been collected as part of the broader prospective cohort study, 'Developing an Evidence-Informed Intensive Care Unit Discharge Tool'.[36] Specifically, physician progress and consultation notes, transfer tools, admission and discharge summaries included in the patient's medical record around the time of ICU to ward transfer—2 days prior to ICU transfer, the day of transfer and up to 7 days post-transfer to the accepting hospital ward (depending on length of hospital stay), totalling up to 10 consecutive calendar days—will be analysed. We anticipate that the 10-day time period proposed will capture the majority of text-based communication related to the transition of patient care from the ICU to hospital ward.

Study sites for data collection

- St Paul's Hospital, Vancouver, British Columbia
- University of Alberta Hospital, Edmonton, Alberta
- Foothills Hospital, Calgary, Alberta
- Rockyview General Hospital, Calgary, Alberta
- Peter Lougheed Centre, Calgary, Alberta
- South Calgary Health Campus, Calgary, Alberta
- Queensway Carleton Hospital, Ottawa Ontario
- Sunnybrook Health Sciences Centre, Toronto, Ontario
- CHU de Quebec (Hôpital de l'Enfant-Jésus), Quebec City, Quebec
- Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, Quebec

Study population

Patients will be eligible to participate in the study if they are admitted to a study ICU and transferred to a hospital ward within the same facility. Eligible participants must be 18 years or older, admitted to a medical/surgical ICU and be able to consent or have surrogate consent. Eligible participants must also be able to speak English or French.

Consent

Patients whose medical records are included in this study provided informed consent to have their medical records copied, de-identified and reviewed as part of the larger ICU discharge study. Informed consent was provided by patients who were determined to have the capacity to consent through a modified Aid to Capacity Evaluation tool.[37] Patients who did not have capacity to consent were included in the study if consent was provided by a surrogate decision-maker.

Data

Each study site across Canada proposes to enrol 50 consecutive patients (n=500) who are eligible to participate in the study and that satisfy the inclusion criteria and consent to participate.[37] Patient medical records will be photocopied, de-identified, assigned a unique identifier and imported into NVivo V.10 for analysis. The contents of the medical record are anticipated to contain (1) physician progress note (whether in a dedicated physician progress note section or multidisciplinary section), (2) consultation notes, (3) admission and/or discharge summaries, (4) ICU patient transfer checklist or other transfer tools and (5) orders if part of a transfer tool.

ANALYTICAL PLAN

Overview

Analysis of de-identified patient medical records will be conducted in three phases (figure 1). In phase I, two investigators with expertise in medical record review will review a subsection of the data while employing an 'open coding' methodology[38] where they will begin to define and develop themes of interest and experiment with labelling concepts. The unit of analysis will be each individual note clustered in the patient's larger medical record. Study objectives (ie, to identify similarities and differences in charting across specialties and units, to determine where breaks in communication and/or the loss of information is occurring, and to investigate how the medical record is used by providers) will be the anchoring principles that guide this initial stage of work.

Drawing on their independent preliminary analysis and observations, investigators will work collaboratively to reach agreement on pertinent themes and concepts emerging out of the data. Shared findings will then be presented to a subset of the larger research team (including one ICU physician, one ward physician and three health researchers) for feedback and discussion and the development of a shared coding framework.

Phase II of analysis will involve sharing this preliminary coding framework with ICU and ward stakeholders to gain a broader perspective on the framework

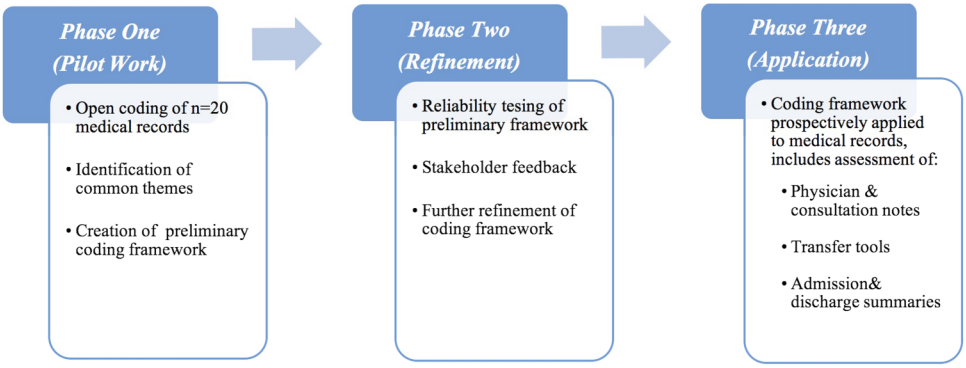

Figure 1 Summary of methodological approach.

developed by the research team. Following this exercise and the implementation of suggested revisions, two investigators will test the updated framework for inter-rater and intrarater reliability by analysing a sample (n=10) of the medical records. Results of this testing will inform the final version of the coding framework. In phase III, this framework will be prospectively applied to the 500 patient medical records. A summary of this approach is depicted below.

Phase I

A pilot project was completed in November 2015 with the purpose of pretesting our chosen methodological approach on a subset of patient medical records. Medical records collected from one study site (n=20) were reviewed and coded by two investigators (JPL, KB). As described above, investigators employed an open-coding methodology by independently documenting patterns, themes and categories of analysis emerging out of the data. This was an exploratory phase of work with the goal of orienting the researchers to the ways that patient information, problem lists and events are documented in the medical record. After individually analysing each of the 20 medical records, the investigators came together to compare notes and findings. Common themes and features were then noted across cases (ie, medical records) first verbally and then via the construction of detailed memos.[39] Four main themes were independently identified by investigators as being in need of further exploration: *organisation* (location and order of information), *readability* (legibility and comprehension), *focus* (how emphasis is placed) and *structure* (style and design). Below is a synopsis of these categories, including related questions to be considered during codebook development (box 1).

Presentation of preliminary findings to the advisory group to the larger study led to the creation of two sets of codes, simple and complex, to guide the development of a refined coding framework. Simple codes denote instances in a patient medical record that capture descriptive statistics and counts of information, such as if the note was signed, properly dated and time stamped. Complex codes denote codes that capture multifaceted issues that transcend variations in focus and style in an individual unit of analysis (eg, inconsistencies in the problem list over time, contradictory accounts or information, etc) and will be used to describe and compare text-based communication within patient medical records (with detailed memos being used to supplement the codes). Below is a synopsis of components that make up this preliminary coding framework (figure 2) which has been developed from the themes identified in phase I and supplemented by background work for this project

Box 1 Emerging themes from medical record analysis

Emerging themes of interest

Organisation

- Is the medical record organisation standard? Is the location where information is recorded within a medical record consistent?
- How is the medical record maintained and managed? To what extent is the organisation and completeness of the medical record maintained?
- What is the interplay between electronic and paper-based charts?

Readability

- Is the medical record legible? To what extent can users of the medical record extract relevant information?
- How frequently are abbreviations used within and between specialties? Do abbreviations potentially impair communication of information?

Focus

- Is there variation in focus between providers within a specialty and between providers of different specialties?
- Is there variation in how a specific type of content (eg, relating to illness, treatment, medication, patient history, etc) is documented?
- What is the purpose of a note? Memory aid, documentation, communication, etc.

Structure

- Is there variation in the structure of physician progress notes between providers within a specialty and between providers of different specialties? Does this matter and if so how?
- How is the note written (point form, sentences or single words)?
- Is there evidence that previous notes are reviewed?
- To what extent are incorrect facts perpetuated in the record?

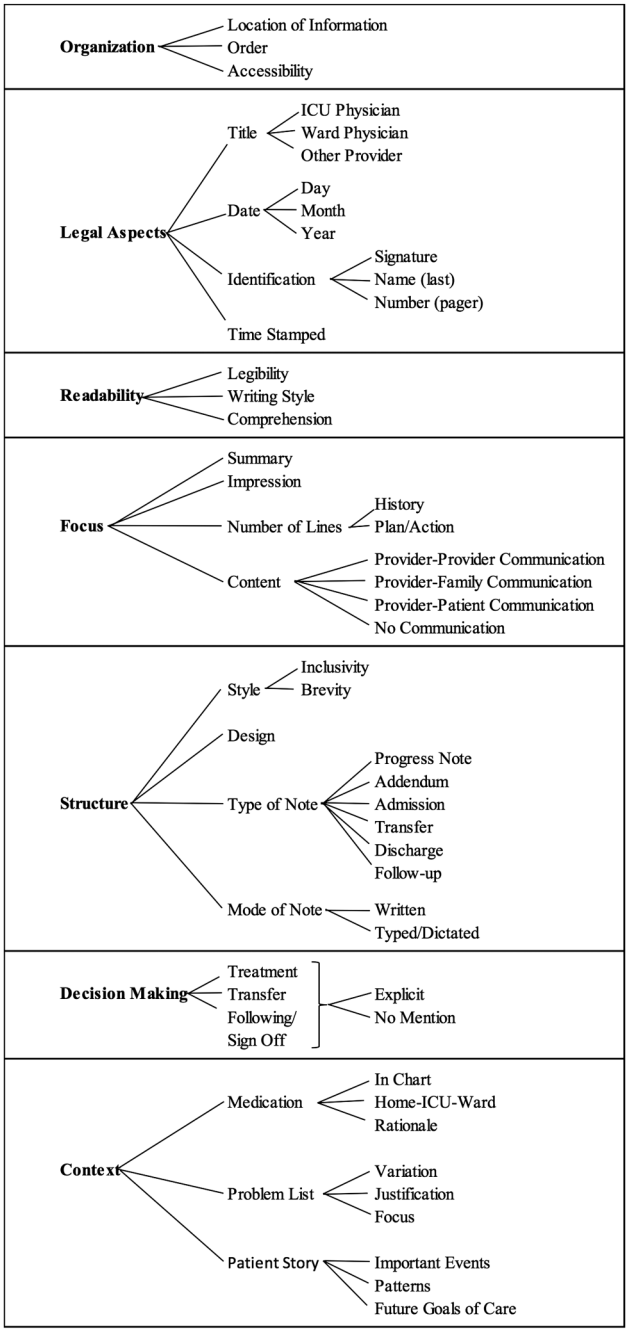

Figure 2 DRAFT (the proposed components are draft and likely to evolve as analysis unfolds) central components of medical record analysis.

(eg, literature review) and the expertise and experience of the larger research team. A more comprehensive version of the framework including a detailed list of proposed codes with examples of when and how to apply is also provided (see online supplementary appendix A).

Phase II

In phase II of this project, the preliminary coding framework will be shared with ICU and hospital ward stakeholders (eg, a sample of front-line providers and decision-makers responsible for patient care) to gain a broader perspective on the codes identified and developed and to ensure that the coding framework sufficiently captures all important elements of text-based communication in the ICU transfer process. Two investigators will then use the refined coding framework to analyse a small portion of the medical records (n=10) to test for inter-rater and intrarater reliability.[40]

Phase III

Based on stakeholder feedback and reliability testing, the coding framework will be further refined and then prospectively applied to the remaining patient medical records (n=470).[i] Specifically, reviewers will assess each medical record in chronological order, including ICU admission note, physician and consultation notes (2 days prior to ICU discharge, day of discharge and 7 days post-discharge), text-based transfer tools (within and across specialties), ICU transfer summary, ward admission notes and hospital discharge note (as available). Each note included in the medical record will be coded line by line during the 10-day time frame. Reviewers will then draw on the coded data to develop a summary report that describes written communication in the patient's medical record during the time of transfer from ICU to hospital ward.

RELEVANCE OF FINDINGS

Streamlining and standardising communication during hospital transitions of care plays a vital role in reengineering ICU discharge and bridging vulnerable moments in healthcare delivery. It is expected that this work will make a significant contribution to the improvement of patient care by: (1) providing a comprehensive description of the textually documented structure and processes of ICU discharge; (2) adding to a conceptual framework of textual communication and (3) generating an evidence informed tool that will streamline[40] communications and enhance patient care. Furthermore, lessons learnt from this work will likely be applicable to other transitions of care that involve written communication (eg, transitions of care between providers within a healthcare setting, patient discharge from hospital) and future research could extend this work to include a focus on interdisciplinary documentation (eg, nursing notes).

NEXT STEPS

This study has the potential to improve the care of critically ill patients during hospital transitions of care by providing a comprehensive description of text-based communication during the ICU to hospital ward transfer process in 10 hospitals across Canada. This will include

[i]The remaining number of patient medical records is 470 as 20 were initially reviewed to identify common themes, and 10 were used for inter-rater/intrarater reliability tests.

an analysis of physician progress notes, dictated admission, transfer and discharge summaries and text-based transfer tools. Next steps include further developing and refining our coding framework based on a process of stakeholder feedback and reliability testing, and prospectively applying the updated framework to patient medical data.

DISSEMINATION

Data collected from this study will inform the development of a communication tool that will be rolled out as part of a customised, multicomponent ICU discharge tool kit for ICU to hospital ward transfers.[36] The overarching goal of this tool kit will be to improve patient outcomes and care across the healthcare continuum by streamlining communication and targeting behaviour change for our stakeholders (patients, families, providers, managers). Key deliverables developed from this study will be made available in English and French. We anticipate that no ethical or safety considerations will arise from this research.

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Contributors All authors contributed to the conception (HTS) or design (JPL, KB, DB) of the work; and drafting (JPL, KB) or revising (DB, HTS) the work for important intellectual content; and provide final approval of the manuscript and agree to be accountable for the accuracy and integrity of the work.

Funding This work was supported by Technology Evaluation in the Elderly Network (TVN) (CORE 2013-12A).

Competing interests None declared.

Ethics approval Research ethics board approval has been obtained at all study sites including the coordinating study centre (which covers 4 Calgary based sites) (UofC REB 13-0021) and 6 additional study sites (UofA Pro00050646; UBC PHC Hi4-01667; Sunnybrook 336-2014; QCH 20140345-01H; Sherbrooke 14-172; Laval 2015-2171).

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement Additional unpublished data from this study are available to research team members as outlined in our ethics certificate (UofC REB 13-0021).

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