Original Article

Development of a quality scoring tool to assess quality of discharge summaries

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Abstract

Introduction: Timely, precise, and relevant communication between hospital-based clinicians and primary care physicians post-discharge (DC) ensures quality transitions, thereby reducing patient safety incidents and preventing readmission. At the present time there is limited knowledge of elements of quality or methods to score the quality criteria in the context of DC summaries. The Nova Scotia Health Authority, a provincial health system responsible for the delivery of services in a small Canadian province, embarked on a system-level approach to the standardization of DC summaries in an effort to improve quality and safety at care transitions from hospital to primary care. **Materials and Methods:** A comprehensive literature review to retrieve items relevant to quality in DC summaries, retrospective audit of charts, a consensus development process, and, finally, validation of a scoring tool were conducted in order to develop a quality scoring tool for DC summaries. **Results:** Relevant items were identified through the literature review and consensus development process. Corresponding definitions that were established assisted the development of the quality criteria, which were subsequently used to score the quality of DC summaries in our organization. **Conclusion:** The scoring tool developed through this work will be applied to help us gain a more in-depth understanding of quality in DC summaries and support the development of suitable education and quality processes in the health authority that can best support safe care transitions for patients.

Keywords: Accreditation standards, quality criteria in discharge summaries, safe care transitions, scoring tool

Introduction

Safe and effective care transitions from hospital to home require accurate and efficient transfer of relevant patient information. Timely, precise, and relevant communication between hospital-based clinicians and primary care physicians (PCPs) postdischarge (DC) ensures quality transitions, thereby reducing patient safety incidents and preventing readmissions.[1] Furthermore, evidence suggests that appropriate engagement of patients and families in DC planning can help make care transitions safe and effective.[2] The DC summary can support quality care transitions and thus is of relevance to clinicians and organizations alike.[3]

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While the DC summary is an important component of quality care transitions, it has been shown that it frequently lacks critical data, is often not received in an appropriate timeframe, or may not even reach the PCP at all, which then results in clinicians being unaware of pending test results and evaluations to be scheduled after DC.[4] Delays in follow-up have been associated with increased hospital readmissions for the same condition and a trend toward a longer length of stay, exacerbating the challenge of providing safe and effective care.[5,6] Furthermore, quality transitions from hospital to community remain out of reach due to the lack of practical and standardized approaches to assess patients who are at a higher risk for hospital readmissions, patient safety incidents, or even death in the immediate post-DC period. Conversely, by standardizing DC summaries, it has been

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demonstrated that uptake and sustainability of process and use are high among end users and timeliness is improved.[7]

Computers may be viewed as a solution to delayed or incomplete information transfer of DC summaries through automation, thereby bringing an increased focus on early DC.[8] O'Leary *et al.* reported reduced delays in the delivery of important information after implementing an automated process, recommending computers to improve overall quality, improve patient satisfaction, and reduce preventable adverse outcomes.[2] In a systematic review of 12 major studies, Motamedi *et al.* assessed the efficacy of computer-based DC communication, finding evidence for comparatively better quality, completeness, timeliness, and satisfaction of physicians and patients/families when electronic systems are used during the DC process.[9] No significant difference for mortality and readmission was reported. Furthermore, limited information about post-DC patient outcomes was found in the review.

However, while automation in the DC process addresses some of the drawbacks of paper-based systems, clinicians do not completely embrace electronic DC (eDC) systems due to issues of system reliability, incompatibility, and period duplication of data. Enguidanos and Brumley (2005) reported less uptake of eDC by physicians who preferred previous practices over the new system, suggesting resistance to change.[10,11] Callen *et al.* reported that incompleteness in eDCs is possibly a result of insufficient training and education of care providers, the lack of understanding of the importance of accuracy and completeness of eDC, inadequate user interface, deficiencies in computer literacy, and insufficient integration with work processes.[12]

Kusnadi concluded that the problem of data quality and delayed delivery of DC summaries may not be solved simply by implementing an eDC summary system and is best targeted by more global strategies, suggesting a more comprehensive approach to facilitate better communication between hospital care and PCPs.[13] Kusnadi posits the "entrenched custom and practice of uni-professional orientation of DC summaries, attitude of senior doctors, usage of short forms and abbreviations, and little accountability for quality control." (pg. 5) He recommends the gap in quality control must be counteracted by training of junior doctors, regulation of use of shortened forms, and improving features of data entry systems. Moreover, he suggests structuring the clinical coding of data, introducing systems to ensure greater organizational accountability for effective DC communication, inter-disciplinary contribution toward building DC summaries, and integrating them into the care pathways. A multipronged approach is supported by Schabetsberger *et al.* when transitioning from paper-based DC communication to help address change management and organizational change challenges.[14] The propensity to automate is validated by the advantages enumerated above; nevertheless, it is prudent for organizations to carefully consider what determines quality in a DC summary. However, a paucity of specific criteria to determine quality of a DC summary in the existing literature has resulted in a lack of consensus on what specifically defines quality of a DC summary and how it can support quality and safe care transition process.[9] This study aims to define the elements of quality in the context of the DC summary and to propose a framework and a scoring tool for organizations to use to determine the quality of existing or proposed DC summaries.

Materials and Methods

Recognizing the value of implementing eDCs, a pilot project in one inpatient department (implemented in April 2012) was subsequently extended across the organization. Based on positive feedback from clinicians, the Nova Scotia Health Authority (NSHA), a provincial health system responsible for the delivery of services in a small Canadian province, embarked on a system-level approach to the standardization of DC summaries in an effort to improve quality and safety at care transitions from hospital to PCPs. The current work contributes to this organizational initiative.

Study design

The methodology for developing the quality tool involved three key steps, outlined in Figure 1. Ethics approval was approved from NSHA's ethics board.

The literature was reviewed to elucidate the meaning of the "quality of discharge summary" and second, to identify specific quality items to be included in the assessment tool. Articles published between 1998 and 2014 were selected which included case studies, surveys, interviews, mixed linear models, and retrospective, prospective, quasi-experimental, systematic reviews, and randomized controlled trials. An initial search conducted in PubMed yielded more than 100 articles, based on relevance, from WorldCat.org, ScienceDirect, and a manual search of article bibliographies. Specifically, Medical Subject Heading (MeSH) terms and the keyword "electronic" as a string were used to access articles. The term "patient discharge" was found to have two meanings in MeSH: "An administrative process" and "summaries that serve as the primary documents." The following search algorithm yielded 48 articles:

> "Electronic" [tw] AND "patient discharge" [MeSH] OR "patient discharge summaries" [MeSH].

In addition, other key words in various combinations were used as strings to find nonindexed articles. The key word terms included: Quality of discharge summary; hospital discharge; quality of eDC; e-discharge; quality of e-discharge summary; quality improvement of discharge summary; quality and timeliness discharge summary; and quality and timeliness hospital discharge.

Figure 1: Study methodology

The literature review was used to identify elements of quality in eDCs. A quality scoring tool was developed based on the evidence review to support the understanding and advancement of quality in DC summaries. The content quality evaluation tool developed as part of this study is intended to be generalizable to other institutions. In addition to examining the status of DC summaries and the care transition process, based on the wide variation of what is deemed to be quality found in the existing research, the criteria identified in the first step of our methodology were further reviewed to validate items through a second step of consensus development. A diverse group of relevant members from the health authority were recruited to review the content and validate the scoring criteria in the scoring tool. These members brought diverse perspectives based on their background and included policymakers, quality leads, family physicians, department chiefs, and researchers. The scoring tool was validated by coders. Inter-rater reliability was calculated to determine the level of agreement among reviewers using Cohen's Kappa.[15]

Results

A key finding from the evidence review showed that the quality of a DC summary is determined by understanding the criteria used for assessment and how these criteria are defined. These searches yielded an additional 42 articles [Figure 2].

Our focus was to retrieve articles comparing electronic and dictated DC summaries and to evaluate the criteria on which the quality of eDC was determined. If abstracts failed the inclusion criteria, a cursory full-text review was performed. Articles were divided into two categories for further analysis. The first category included 51 articles comparing electronic versus handwritten or dictated DC summaries. The second category included 39 articles about quality improvement initiatives, aspects of DC summary quality, family physician surveys about quality

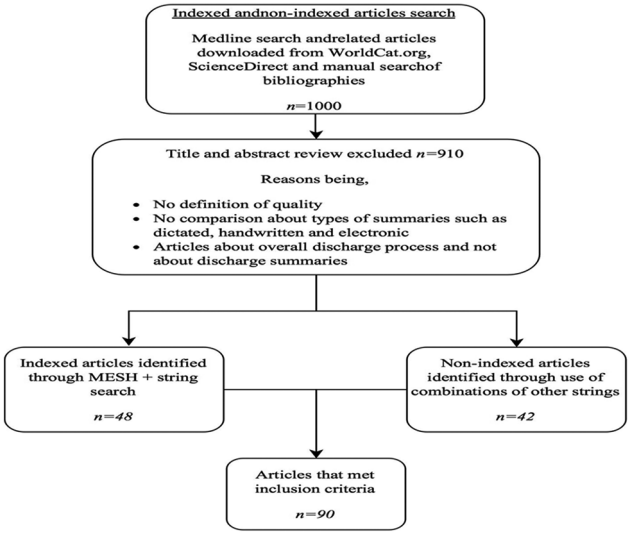

Figure 2: Literature search

aspects of summaries, and quality improvement experiences of organizations.

Horwitz *et al.* assessed the quality of DC summaries in three domains: timeliness, transmission, and content.[3] They defined timeliness as the number of days elapsed between the date of DC and the date of dictation, median timeliness (the most common timeline required to complete post-DC dictation), and the percentage of summaries completed on the DC day. The evaluation of the transmission aspect has two components: first, a proportion of summaries sent out successfully and second, median number of physicians per DC summary scheduled for patient follow-up without receiving a copy of the summary. Content is defined as presence of 21 predetermined items. In addition, compliance with Joint Commission (JC) and Transitions of Care Consensus Conference (TOCCC) recommendations on individual items was also assessed. In contrast, Russell *et al.* assessed DC summary quality on four areas of common error: presentation, relevance, accuracy, and clarity.[16] Presentation is defined as the use of subheadings to compartmentalize information and appropriate prioritization of problem list. Accuracy is the verification of significant abnormalities, such as laboratory or physical findings by comparing them to results obtained from computer databases. Clarity is inclusion of all the significant findings without excluding important details. Relevance is defined as whether the listed principal and secondary diagnoses are relevant to current admission and the discussion in the clinical synopsis.

Other studies have assessed DC summaries based on completeness, pertinence, organization, and global rating, and inclusion (of predetermined data items), clarity (whether lucid, understandable, hard to read, or unintelligible), exclusion (percentage of useless material in summary), and consistency (level of consistency of dictation with principal diagnosis).[17,18] It is important to note that most of these concepts are open to deliberation and subjective interpretation and therefore, must be carefully defined and validated, which is the approach taken in the current work. However, our literature review and consensus development process consistently highlighted particular aspects of a DC as being critical [Figure 3].

Table 1 shows a list of the most relevant items identified from literature review and the corresponding definitions that were established to assist in our development of the quality criteria.

Thirteen items suggested by the JC and TOCCC and an initial ten items ranked according to hospitalist and PCP preference were adapted for our purposes.[2,4,19] Consensus definitions of JC items were consulted to specify items in our scoring tool, followed by assigning appropriate weights to assess quality based on each item's individual contribution.[20] An item would get the defined maximum score when content is ideal, sufficient, accurate, and clear.

Scoring of individual items was a two-step process: in the first step, an item was assigned a base score up to a maximum of

two points based on the assessment of information content. One point was deducted when information was deficient or excessive/irrelevant to the DC. No points were assigned if the information was absent. In the second step, base scores were multiplied with preassigned weights.

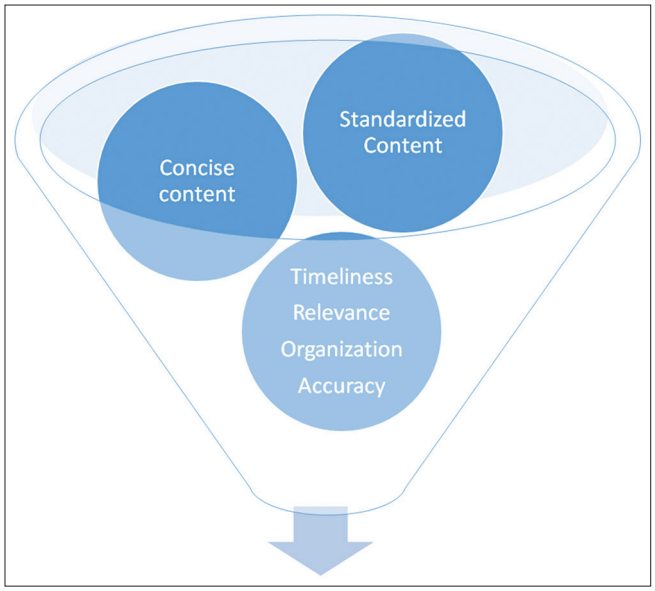

Figure 3: Quality criteria

Quality scoring tool

A total of eight key stakeholders participated in the consensus development process. The team developed required elements of assessment, standardized definitions, scoring criteria, and methods that are described in the following sections.

The tool is based on six components proposed in the JC Standard IM.6.10, EP 7 as shown in Table 2: (1) Reason for hospitalization, (2) significant findings, (3) procedures and treatment provided, (4) patient's DC condition, (5) patient and family instructions (as appropriate), and (6) attending physician's signature.[19-21] It is also based on seven TOCCC recommendations: (1) Principal diagnosis, (2) problem list, (3) medication list, (4) transferring physician name and contact information, (5) cognitive status of the patient, (6) test results, and (7) pending test results for quality DC summary.[22]

Validation of scoring tool

The scoring tool was then validated by four coders who rated eDC quality using the tool. The coders were two members of the research team (a physician team member and research associate) and two community physicians. This process helped to further refine the scoring strategy used in the tool. Each member applied the scoring tool to rate the quality of five eDC summaries randomly selected from a set of recently completed summaries by another member of the research team. We completed two iterations of

Table 1: Scoring tool content

Item	Definition
Admission diagnosis	Preliminary or working diagnosis given at the time of admission
List of DC diagnoses	Principal DC diagnosis or main reason for admission and all additional pertinent diagnoses where applicable
Discharge diagnosis responsible for the greatest part of the LOS	Diagnosis mostly accountable for the largest portion of the patient's stay
History of presenting illness	A brief summary of initial presentation and diagnostic evaluation
Pertinent physical findings	Physical findings relevant to diagnoses
Goals of care	Level of treatment, code status (e.g., curative, life-prolonging palliative, and symptomatic palliative)
Course in hospital	Synoptic, problem-based description of sequential events and respective evaluations, treatments, and prognoses
Hospital consults	Description of specialty and/or allied health consults
Procedures in hospital	A list of procedures with key findings and date
Discharge medication	A listing of all DC medications with specific description of new, altered, and discontinued medications and rationale for changes.
Pertinent laboratory tests and investigation results	Relevant (key) tests and investigations
Test results pending at DC	Tests ordered during the hospitalization that are pending at the time of DC
Outcome of care/condition at DC-functional ability	Documentation that gives a sense of the patient's health status at DC. When applicable, includes functional status (e.g., if they can perform their activities of daily living), cognitive status (e.g., memory, attention, and executive functioning)
Follow-up issues identified	Clearly described outstanding issues for follow-up and set out recommendations to a recipient health-care provider
Appointments after DC	Person responsible for scheduling, date, time/timeframe, care provider name, and specialty where applicable
Discharge instructions	List of verbal/written information/education provided to patient/SDM clearly stated. Where applicable, symptoms and signs to seek care for (e.g., unresolved or recurring chest pain, signs of infection)
Identified attending clinician to be called by PCP if there are questions	Main author of the DC summary clearly stated

PCPs: Primary care physicians; SDM: Surrogate decision maker; LOS: Length of stay; DC: Discharge

Table 2: Scoring criteria

Component item	Omitted (0)	Less than optimal (1)	Optimal (2)	Excessive (1)
Admission diagnosis	No information	Less than optimal e.g., only chief complaint or presenting symptoms	Preliminary or working diagnosis given at the time of admission	
List of DC diagnoses	No information	Less than optimal e.g., only signs, symptoms, or unknown abbreviations	Principal DC diagnosis or main reason for admission and all additional pertinent diagnoses where applicable	
Discharge diagnosis responsible for the greatest part of the LOS	No information	Maximum 1 diagnosis accountable for the largest portion of the patient's stay		
History of present illness	No information	Some information missing	A brief summary of initial presentation and diagnostic evaluation	Excessive description
Pertinent physical findings	No information	Some information missing	Findings relevant to diagnoses	All findings or substantial number of irrelevant findings
Goals of care	No information	Some information missing	Level of treatment, code status (e.g., curative, life-prolonging palliative, and symptomatic palliative)	
Course in hospital	No information	Incomplete description with missing links	Synoptic, problem-based description of sequential events and respective evaluations, treatments, and prognoses	Excessive information
Procedures in hospital	No information	Unknown abbreviations used	A list of procedures with key findings and date OR statement "not applicable"	
Discharge medication	No information	Some information missing	A listing of all DC medications with specific description of new, altered, and discontinued medications and rationale for changes OR specific statement: "See DMR" OR a specific statement "no medications"	
Pertinent laboratory tests and investigation results	No information	Some information missing	Relevant (key) tests and investigations	All tests and investigations, or substantial number of irrelevant results
Test results pending at DC	No information	Some information missing	Tests ordered during the hospitalization that are pending at the time of DC	
Outcome of care/ condition at DC-functional ability	No information	Some information missing	A documentation that gives a sense of patient's functional and/or cognitive health status at DC when applicable, for example, stable at baseline Where applicable, includes residual comorbid illnesses and risk factors	
Follow-up issues identified	No information		Description of outstanding issues that will require follow-up along with recommendations for recipient health-care provider OR statement that "no outstanding issues exist" or "no recommendations exist"	
Appointments after DC	No information	Some information missing	Person responsible for scheduling, date, time/timeframe, care provider name, and specialty where applicable	
Discharge instructions	No information	Some information missing, for example, a mention about DC instructions given without specifying what they were	List of verbal/written information/education provided to patient/SDM clearly stated Where applicable, symptoms and signs to seek care for (e.g., unresolved or recurring chest pain, signs of infection) OR statement "No special education/ instruction required"	
Identified attending clinician to be called by PCP if there are questions	No information	Some information missing	Main author of the DC summary clearly stated	

LOS: Length of stay; SDM: Surrogate decision maker; PCPs: Primary care physicians; DMR: Discharge monitoring report; DC: Discharge

validation with two sets of five charts and modifications to the scoring strategy to shift the kappa scores from a fair level of agreement (0.05) to a moderate level of agreement (0.58) among reviewers in the coder rating of the quality (0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1.00 as almost perfect agreement).[15]

Discussion

The primary objective of this initiative was to examine quality, patient safety, and best practices in care transitions while we move toward adopting user-friendly tools for standardized patient care documentation. The eDC provides an important transition step for processes, behaviors, and system changes that are required to support an electronic documentation environment as shown in Table 2. However, based on our review of the current status and evidence, it was identified that there was a clear gap in established definitions and criteria to ascertain quality in DC summaries. These standards are equally important in determining the benefits and merits of using eDC summaries.

As described in this article, a comprehensive literature review helped develop quality scoring tool which will be used to assess the current state of quality in DC summaries leading to some future state considerations for quality in DC summaries and care transition processes.

Conclusion

In this paper, we have described the development and application of a quality scoring tool to improve the quality of care transitions for patients being discharged from hospital care to the care of their primary care physicians. Next steps of this work will involve using the quality scoring tool to encourage education, training and other supports to further enhance the use of eDCs at the point of care and in follow up care to better meet the needs of patients and providers and towards the broader goal of improving safety of care in care transitions. Quality assurance in eDC can impact transitions to PCPs, an important consideration as increasing numbers of patients are cared for in community settings.

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Conflicts of interest

There are no conflicts of interest.

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