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Identifying essential elements to include in Intensive Care Unit to hospital ward transfer summaries: A consensus methodology☆

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ABSTRACT

Purpose: Transitions of care from the intensive care unit (ICU) to a hospital ward are high risk and contingent on effective communication. We sought to identify essential information elements to be included in an ICU to hospital ward transfer summary tool, and describe tool functionality and composition perceived to be important.
Materials and methods: A panel of 13 clinicians representing ICU and hospital ward providers used a modified Delphi process to iteratively review and rate unique information elements identified from existing ICU transfer tools through three rounds of review (two remote and one in person). Qualitative content analysis was conducted on transcribed audio recordings of the workshop to characterize tool functionality and composition.
Results: A total of 141 unique information elements were reviewed of which 63 were identified by panelists as essential. Qualitative content analyses of panelist discussions identified three themes related to how information elements should be considered when developing an ICU transfer summary tool: 1) Flexibility, 2) Usability, and 3) Accountability.
Conclusion: We identified 63 distinct information elements identified as essential for inclusion in an ICU transfer summary tool to facilitate communication between providers during the transition of patient care from the ICU to a hospital ward.

1. Introduction

Transfers of care between the intensive care unit (ICU) and hospital ward represent complex and vulnerable scenarios for patients [1-3]. As the sickest patients in the hospital begin to regain their health and no longer require life-sustaining therapies, a transfer of care occurs from the high-resourced environment of an ICU to a less-resourced (e.g., increased patient-nurse ratio) hospital ward where their road to recovery continues [4-6]. This involves both the physical movement of patients with reduced physiological capacity [10] between units, as well as an exchange of pertinent information about the patient between healthcare provider teams [3,11-13]. These are vulnerable periods in healthcare delivery that are associated with increased risk of medical error and adverse events [3,7-9].

A key factor to high quality ICU transfers of care is effective communication between the sending (e.g., ICU) and receiving (e.g., hospital ward) healthcare teams [14,15]. Studies have shown that transfer communication is not standardized and often the information included in a transfer summary is left to the discretion of the sending ICU providers [6,16]. Existing literature highlights that current transfer communication practices are suboptimal and the information needs of receiving ward providers are often not met [11,12]. These communication deficits can result in ambiguity around the patient's clinical course and who is responsible for care, both have important implications for continuity of care and patient safety [3,17].

To address this gap, we assembled a diverse panel representing a breadth of perspectives and utilized a modified Delphi consensus method to inform the development of an evidence-informed, standardized medical ICU transfer summary tool. Our objective was to identify essential information elements to be included in an ICU to hospital ward transfer summary tool, and describe tool functionality and composition perceived to be important by physicians, and nurse practitioners.

☆ The ICU transfer summary panelists include (alphabetically by last name): Anshula Ambasta, Tavish Barnes, Kirsten Deemer, Gunnar Everson, Jonathan Gaudet, Christopher Grant, Calvin Lam, Kenneth Leung, Ron Prince, Juan Posadas, Derek J. Roberts, Michael M.H. Yang, Kelly Zarnke.

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2. Material and methods

We conducted a modified Delphi process [18] with a diverse group of expert panelists (physicians, nurse practitioners) to review, rate and develop a candidate list of essential information elements for inclusion in an evidence-informed ICU transfer summary tool. In addition, we conducted a qualitative content analysis of the in-person meeting discussions to describe how these information elements could be included in an ideal transfer summary tool.

2.1. Selection of panelists

The optimal number of panelists for a consensus process has yet to be established [19-22]. As such, the panel was designed to represent a diverse group of stakeholders involved in the ICU to hospital ward transfer process. We assembled an expert panel ($n = 13$) of physicians (residents, fellows and attendings), and nurse practitioners (working in a limited and supervised scope of medical practice) representing ICU and hospital ward providers (Table 1). The panelists worked in teaching, non-teaching, community and tertiary care hospitals with closed medical-surgical units (able to provide invasive monitoring, vasoactive medications and mechanical ventilation), staffed by accredited intensive care physicians, and included adult medical and surgical (vascular surgery, thoracic surgery, neurosurgery trauma, burns, plastic surgery and transplant) patients [23]. Patients and families were not included as panelists to allow for development of distinct tools for provider-provider communication and provider-patient/family communication. Our working group, comprised of healthcare professionals and academic researchers, purposively nominated panelists to ensure a diversity of expertise and experience.

2.2. Rating Instrument

We developed an electronic survey instrument using a secure online survey software (SurveyMonkey, Palo Alto, CA, USA) that included 141 distinct information elements identified from 21 existing unique transfer tools collected from a national survey of medical-surgical ICUs and hospital wards across Canada [24]. The distinct information elements were aggregated into 26 categories [Supplementary File 1] and included in an importance-rating instrument developed using the Joint Commission's Attributes of Core Performance Measures and Associated Evaluation Criteria [25]. For each category, panelists received a category definition and a list of unique information elements, presented across a validated nine-point Likert scale (1 = non-essential; 9 = essential), for inclusion in an ICU transfer summary tool [18].

Table 1
Participant characteristics (n = 13).

	n(%)
Sex	
Male	11(85)
Female	2(15)
Qualifications	
Physician	10(77)
Attending	6(46)
Resident	2(15)
Fellow	2(15)
Nurse Practitioner	3(23)
Clinical expertise	
Critical Care	5(38)
Critical Care Outreach	1(8)
General Internal Medicine	2(15)
Neurosurgery	2(15)
Hospitalist	1(8)
General Surgery	1(8)
Physiatry and Rehabilitation Medicine	1(8)

2.3. Consensus rating process

We used a three-round modified Delphi [18] process to conduct an iterative review and revision of candidate information elements for inclusion in an ideal ICU transfer summary tool. Panelists participated in two rounds (Round I & Round II) of remote review of candidate information elements using the electronic survey instrument [see Supplementary File 1]. In both remote rounds, panelists were asked to rate which information elements were essential for inclusion in an ideal ICU transfer summary tool without consideration of constraints of current systems or processes (e.g., in an idealized context). Panelists were asked to utilize the open-text fields after each category to provide written comments on the presented information elements and to suggest any additional elements for consideration. Panelists were presented with all 141-candidate information elements in Round I, whereas in Round II panelist were only presented information elements for which consensus had not been established (i.e., consensus as being an essential or non-essential information element).

Round III was a half-day in-person meeting, facilitated by an experienced qualitative researcher (CJM) in Calgary, Alberta, Canada on November 28th, 2016. The goal of the meeting was to reach consensus (see definition in analysis section), on all information elements that remained without consensus after the first two rounds of remote review. The day began by stating meeting objectives – to identify essential elements to be included in an ideal ICU transfer summary tool - and providing panelists with context for this in-person activity within the broader program of work that focused upon improving the transfer of patients from the ICU to a hospital ward [13]. Over the course of the day, panelists re-rated the information elements without consensus (Round III) using an electronic live voting tool (Poll Everywhere, San Francisco, CA, USA). Definitions of the aggregate categories and examples of information elements were presented and visually projected. A round table discussion of each information element and rationale for its current importance rating occurred in this final round of voting.

2.4. Analysis

2.4.1. Ratings of information elements

Panelists' ratings were summarized using medians and interquartile ranges (IQR). Consensus was defined as elements that received a median rating of 'non-essential' (1–3) or 'essential' (7–9) and fewer than two panelists rated the elements outside of the median tertiles. Information elements were classified as 'uncertain' when the median rating was 4–6 or when two or more panelists rated the elements outside of the non-essential (1–3) or essential (7–9) tertiles. Disagreement was defined as three or more panelists rating the element as non-essential (1–3) and at least three panelists rating the same element as essential (7–9). This approach was used to ensure when there was a polarization in ratings between panelists that further discussion and rating would be performed.

2.4.2. Thematic analysis of stakeholder discussion

The in-person meeting was audio recorded and transcribed verbatim for the purpose of conventional qualitative content analysis [26,27]. Three researchers (CdG, JMB, JPL) recorded qualitative observations and memos during the event that were used as data. Two independent researchers (CdG, CJM) reviewed the transcripts and analyzed the data through a series of iterative comparative rounds. First, they compared the data (transcripts, observations and memos) to one another to develop thematic codes; next they compared the data with codes; then the codes were compared and significant codes were identified as tentative categories; tentative categories were compared to one another and subsequently identified as categories [28,29]. Any disagreements were resolved by discussion and a unified list of thematic categories was achieved. The resulting thematic categories presented below, highlight the key considerations for the ideal composition and

functionality of an ICU transfer summary tool as described by the panel. Disfluencies in exemplar quotes were removed to improve readability.

2.5. Ethics

We obtained written consent from all participants to audio-record the meeting discussions. The Conjoint Health Research Ethics Board, University of Calgary (REB16–0737) approved this study.

3. Results

Of the 13 individuals invited to participate in the expert panel, all 13 agreed to participate (100% participation rate). Characteristics of the panelists are described in Table 1.

3.1. Consensus process & results of rating information elements

The identification of information elements as being of essential, non-essential or uncertain importance for inclusion in an ideal ICU transfer summary as depicted in Fig. 1. Panelists were presented with all 141 distinct information elements in Round I and 91 information elements in Round II. The three rounds (two remote [Rounds I & II], one in-person [Round III]) of iterative review resulted in 63 information elements being identified by panelists as essential for inclusion in an ICU transfer summary tool (Table 2). Another 16 information elements were identified as non-essential and 91 information elements were classified as being of uncertain importance. As outlined in Supplementary File 2, the information elements rated as essential included *basic demographics* (e.g., goals of care designation) and descriptions of: *present illness* (e.g., active problems); *medications* (e.g., medication reconciliation); *past illness* (e.g., allergies); *drains, lines, tubes and technologies present at transfer* (e.g., central venous catheter); *drains, lines, tubes and technologies discontinued prior to transfer* (e.g., tracheostomy); *review of key body systems* (e.g., precautions for infection control); and both the *team transferring* (e.g., individual completing the transfer summary) and *team receiving* (e.g., most responsible physician accepting care) *the patient*. In addition to this, Supplementary File 2 details the rating of non-essential information elements and those without consensus (uncertain or disagreement).

3.2. Content analysis of the functionality and composition of ICU transfer summary tool

Supplementary File 3 provides additional quotations to support the credibility of the three main themes related to functionality and composition of an ideal ICU transfer summary tool identified from the transcript and observation notes collected from the in-person meeting: 1) *Flexibility*, 2) *Usability* and 3) *Accountability*.

3.2.1. Flexibility

Flexibility was described as the need for the ICU transfer summary tool to have functions including: auto-population from the electronic medical record (EMR) so the entry of patient data is efficient and ensures consistency; and mandatory 'click boxes' so that critical details

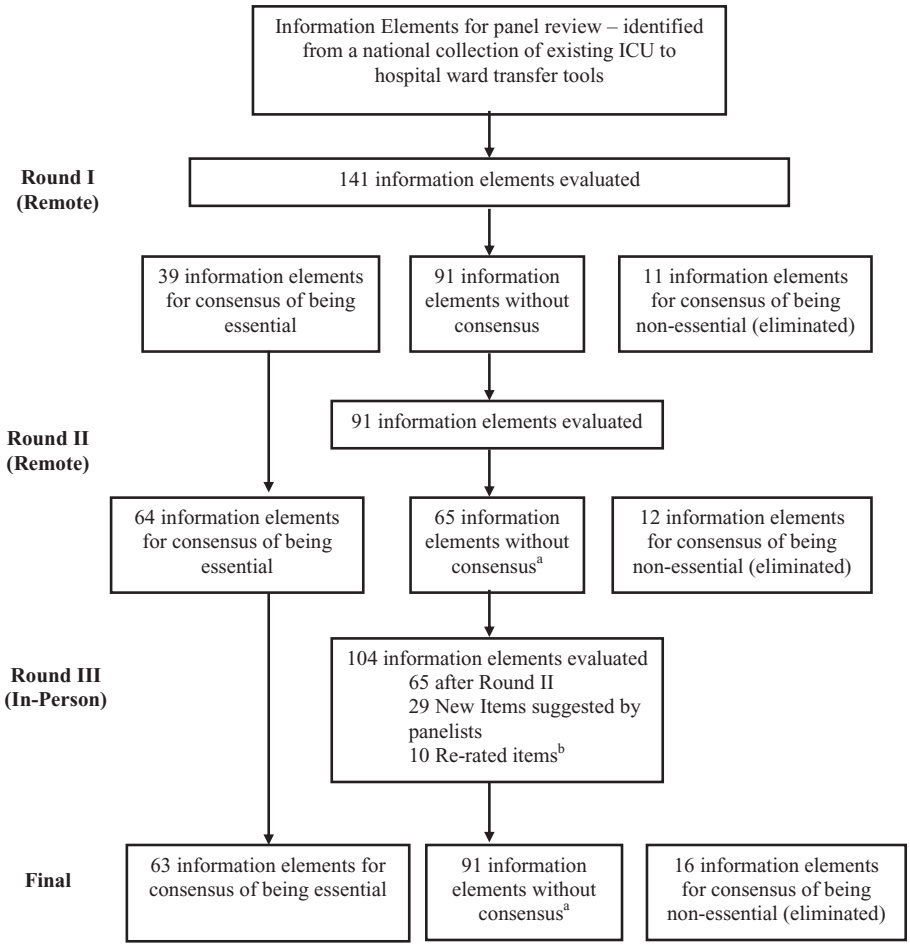

Fig. 1. Flow Diagram of Information Elements: Identification and refinement of essential information elements for an ICU transfer summary tool by panel of ICU to hospital ward transfer experts. [a]Information elements without consensus include those with 'uncertain agreement' or 'disagreement'. [b]At the in-person meeting (Round III) panelists were asked to review all the information elements. At this point panelists elected to re-rate 10 information elements.

Table 2
Essential information elements after three-round modified Delphi process.

Information Element
Basic Demographics
Name
Medical Record Number
Date of Birth
Sex
Advanced Care Directive Availability
Goals of Care (Resuscitation, Medical Care, Comfort Care)
ICU Length of Stay
Past Illness
Past Medical/Surgical Comorbidities
Allergies
Present Illness
Diagnosis/Operative Procedures Related to Present Illness
Primary Diagnosis
Secondary Diagnoses
Description of Clinical Course
Description of Procedures
Issues/Problems at Time of Transfer
Active Problems
Resolved Problems
Services Following Patient
Care Plan
Treatments Received
Treatments Planned
Medications
Medications from Home
Active Medications on Transfer
Rationale for Medication Regime
Intravenous Infusions
Drains, Lines, Tubes and Technologies Present at Transfer
Surgical Drains
Arterial Line
Central Venous Catheter
Dialysis Catheter
Tracheostomy
Date/Time Inserted
Endotracheal Tube
Date/Time Inserted
Chest Tubes
BiPAP/CPAP Machine
Infectious Disease
Isolation/Precautions Status
Neurological
Delirium
Level of Consciousness
Spinal Precautions
Respiratory
Airway Concerns
Restraints
Mechanical
Pharmacological
Gastrointestinal
Swallowing Status
Genitourinary
Kidney Injury
Cumulative Fluid Balance
Integumentary and Surgical Wound Management
Skin Ulcer Monitoring/Management
Surgical Wounds Assessment/Management
High Risk Transfer Criteria or Risk Stratification
High Risk Transfer Criteria
Reports Transferred with Patient
Medications Reconciliation
Orders Updated
Discharge Instructions
Team Receiving the Patient
Receiving MD
Receiving Unit
ICU Team Transferring the Patient
ICU Admission Date/Time
ICU Discharge Date/Time
Hospital Admission Date/Time
Patient Transferring To [ward, ICU, Inter-hospital, Home]
Provider Completing Transfer Summary
Completing Provider Name
Date/Time Signed
Date/Time Complete
Additions/Addendums
Date/time Additions/Addendums
Accepting/Receiving Provider
Accepting/Receiving Provider Name

are included. In addition, the panel suggested that both aforementioned functions should have the capability for the provider populating the transfer summary to customize additional pertinent information with open-text boxes to accurately depict the patient's clinical course in ICU.

> *"[If the tool just] force functions everything then it is just lists, and lists without me understanding what ICU team was thinking versus me saying this is what the ICU team thought. I think there needs to be a balance. Some things are checkboxes, and these are important boxes, but if the [patient's] entire course in ICU is checkboxes you are never understanding the rationale around why they did what they did…"*
>
> [- Receiving Provider 1]

3.2.2. Usability

Usability described the need for the ICU transfer summary tool to be a 'living document' in an EMR that would allow for patient information to be stored in real time (e.g., during/after daily rounds at the bedside) and updated throughout a patient's stay in ICU. Such functionality would aid providers in conveying the most relevant problems at the time of transfer, and ensure the list is reflective of both active and resolved problems experienced during the course of ICU. The intent is to provide a comprehensive clinical picture.

> *"Have a living problem list… that is structurally populated throughout the ICU stay and then those issues that are resolved still stay on the list, they don't get deleted."*
>
> [-Receiving Provider 7]

3.2.3. Accountability

Accountability was described as the need for the ICU transfer summary tool to include fields (e.g., date/time stamp when patient leaves ICU, name and contact information of most responsible sending [ICU] and receiving [ward] physicians) that clearly state who was/is responsible for the patient while documenting important details of the transfer processes.

> *"If I am the sending provider, then my name [including signature] should be on there. This is an easy quick thing to do as a dropdown box, the value of having it included is higher than the amount of work to achieve it."*
>
> [–Sending Provider 3]

4. Discussion

We brought together an expert panel of providers and utilized a validated consensus methodology to identify information elements deemed 'essential' for inclusion in a stakeholder driven ICU transfer summary tool. The result is a catalogue of 63 information elements essential to ICU transfer communication. A qualitative content analysis of the in-person discussion revealed three main thematic considerations (*Flexibility*, *Usability* and *Accountability*) that describe the proposed functionality and composition of the 'ideal' ICU transfer tool.

Prediction tools that assess outcomes after ICU discharge have been posited to improve discharge decisions. However, most existing ICU transfer tools have not been validated, have not undergone comparative evaluation, and have not been shown to improve patient care and outcomes [9]. In the present study, essential information elements were selected for an ideal transfer summary tool out of a list of 141 information

elements derived from existing transfer tools. Qualitative considerations provided details about how these essential information elements could be developed and implemented into a flexible and functional transfer summary that holds providers, both sending and receiving accountable for patient care.

Flexibility in the construct of a transfer tool can ensure that it is user friendly, intuitive and efficient, as highlighted on numerous occasions by panelists. Previous studies have shown that current tools are onerous to populate and time consuming to ensure all the important patient data is recorded [30,31]. Despite this, checklists are perceived to be useful for handover from ICU to general ward settings [32]. Panelists identified the importance of efficiently conveying information with little technical input requirements for documentation. One solution to this was to provide as much information in an auto-populated fashion, which can be drawn from the EMR to ensure that the information is consistent and that it is efficient for the completing provider to enter. Auto population of certain elements could minimize the errors in reporting this information, and facilitate flexibility as well as sustained use from providers [31,33]. The panelists also suggested that essential information elements such as those under the *drains, lines, tubes and technologies discontinued prior to transfer* (e.g., tracheostomy) category need to be supplemented by details around insertion and removal as it is not enough just to know they were/are present. This echoed previous work that highlights flexibility as essential to implementation and sustainability of transfer tools in health care settings [31]. During discussion at the in person meeting panelists stated that the essential information elements of medication reconciliation, orders updated and discharge instructions should be included as a checkbox field to ensure that these items were completed by the ICU team upon transfer. Implementing medication reconciliation into practice has been an ongoing effort in standardization [34-36]. The ICU transfer summary tool offers a way to incorporate this into the transfer process and ensure that the sending provider completing the tool does so upon transfer.

Usability of standardized of communication tools has been highlighted as a priority by the Joint Commission for Accreditation of Health Care Organization and numerous research studies [37-39]. Panelists echoed this need and also highlighted the importance of physician autonomy and the ability to communicate relevant details concerning patient data in multiple ways. Discussions around achieving a balance between standardized mandatory information elements and those that can be tailored by the sending provider completing the ICU transfer summary in order to tell the patient's story were robust. In particular, information elements under the *present illness* (e.g., active problems) category were described as needing to be included in the tool in such a way that allowed the provider populating the transfer summary ability to include information that they deem most important to the current health status of the patient. One solution to this issue suggested by panelists, was to structure the ICU transfer summary tool to function as a living document. This way, the tool could be iteratively updated while the patient is in ICU so that *present illness* category would be comprised of both relevant active problems and resolved problems, ensuring an accurate reflection of the patient's course in ICU and not leaving out any issues (either active or resolved) relevant in a hospital ward setting. Creating a culture of handovers, rather than handoffs, between multidisciplinary teams has been emphasized as key for continuity of patient care [40]. Integration of an ICU transfer summary that functions as a living document could support the development of a such a culture. Furthermore, this could address communication gaps, which are reported to be common particularly in large academic centers, between ICU and ward providers by having all team members present in a multidisciplinary handover with a document that accurately reflects the patient's ICU stay [41,42]. In addition, studies suggest that communication should be multimodal; information elements identified could be used to inform development of both written and verbal communication tools. [13,43]

Accountability is important for an understanding of who is responsible for the patient. There have been instances documented where patients are 'lost' to medical care during transitions [17]. In our study panelists rated information elements, such as ICU discharge date and time, name of provider completing the transfer summary and accepting/receiving provider name as essential. This issue of accountability is further complicated by discrepancies in transfer information given and received between ICU and ward providers. One study suggests that there is a disconnect in the ICU transfer information given (by ICU providers) and received (by ward providers) [13]. ICU providers think they provide information to ward providers involved in the transfer of patients from ICU to hospital ward more than ward providers report receiving this information [13]. Inclusion of information elements of the most responsible provider's name and contact information in the ICU transfer summary tool should aid in opening communication lines between providers and offering documentation of transfer information.

4.1. Strengths and limitations

We acknowledge that patients and families are increasingly engaged in care and decision-making processes [44,45] and though this perspective is absent in this body of work, we have moved forward with the next steps of this project that includes patients and families perspectives to identify the information elements essential for engaging and empowering patients and families in the transfer process. This study was conducted in a single healthcare setting which could limit the generalizability of our findings. Our catalogue of information elements can serve as the foundation for a base model ICU transfer summary tool that can be customized or tailored for local settings (e.g., structured verbal or written communication tools), and the thematic considerations of flexibility, functionality and accountability are likely broadly applicable when developing an ICU transfer summary tool. This tool should be evaluated prior to implementation to ensure that it does not have unintended consequences and improves patient care [46,47]. This study describes key information elements needed during ICU to hospital ward transitions of care as well as those factors that should be considered when building a tool. This information can be used by clinicians and managers to build communication tools for local contexts. Our team has used this information to build a tool which we are currently evaluating.

5. Conclusions

Our study identified through a consensus process a standardized model for ICU discharge communication. We provide a catalogue of essential information elements that stakeholders identified as essential to include in an ICU transfer summary tool. Flexibility, functionality and accountability should be considered when customizing these essential items for a different hospital setting.

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Conflict of interest

The authors declare no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jcrc.2018.10.001.

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