Analyzing Information Needs in Critical Care Handoffs

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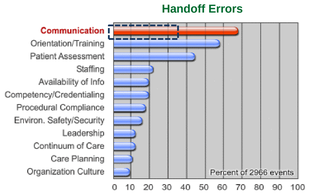
Introduction

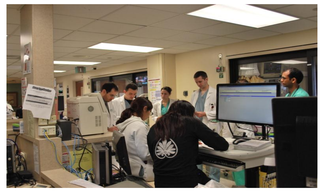
- Handoff is defined as *the transfer of care* from one care provider to the next
  - The transfer involves three critical aspects – information, responsibility and authority
- Handoff has been characterized as being "remarkably haphazard"
- The Joint Commission has mandated US hospitals *to standardize handoffs* between "outgoing" and "oncoming" teams to support accurate and complete information transfer
- Poor information seeking practices of "oncoming" teams during handoffs impact the effectiveness of handoff communication
  - Oncoming teams face challenges in articulating their information needs to outgoing teams
  - As a result, some diagnostic and therapeutic decisions about patient cases are made with *inaccurate, incomplete, and ambiguous information*[1]
- **Research Gap**: There is limited work on information needs of oncoming teams which will impact the recommended design of effective handoff tools
- **Study Objective:** Develop an understanding about (1) handoff communication and (2) information seeking behavior of oncoming teams during handoffs



Methodology

- **Research Context** : 16-bed Medical Intensive Care Unit (MICU) in an academic hospital
- **Handoff Type**: Resident Handoffs between outgoing team (resident and intern) and oncoming team (attending physician, fellow, resident, intern, and pharmacist)

Resident Handoffs in the MICU



MICU Roles and Responsibilities

MICU Roles	Patient-care Responsibilities
Attending Physician	Intensivist head of the MICU team and is in charge of all patient-care decisions.
Clinical Fellow	Intensivist in training and makes major decisions in the absence of the attending, and keeps the attending informed of patients' status and also supervises all residents and students for daily duties, including patient care and procedures.
Medical Resident	Post-graduate physician in their second or third year internal medicine residency training and is in charge of patient-care activities in the MICU, and works under the direction and supervision of the attending physician.
Medical Intern	A physician in their first year of residency training and is in charge of care activities for patients in the MICU, and works under the direction and supervision of the attending physician and the resident.
Pharmacist	Monitors drug therapy; reviews medication regimen and provides other medication recommendations.
Respiratory Therapist	Evaluates and performs therapeutic treatment and diagnostic procedures for patients with respiratory or other cardiopulmonary disorders

- **Data Collection Approach**: Handoff-centered Approach

Data Collection Methods

Method	No. of Participants	Type of Participants	Data collection time (in hours)
Audio-recording and clinician shadowing	48 handoffs (in 3 days)	MICU team (outgoing and oncoming clinicians)	9
Interviews	7	Attending physicians, fellows, residents	2.5

- **Data Analysis Approach**: Mixed Inductive-deductive Approach

Data Analysis Methods

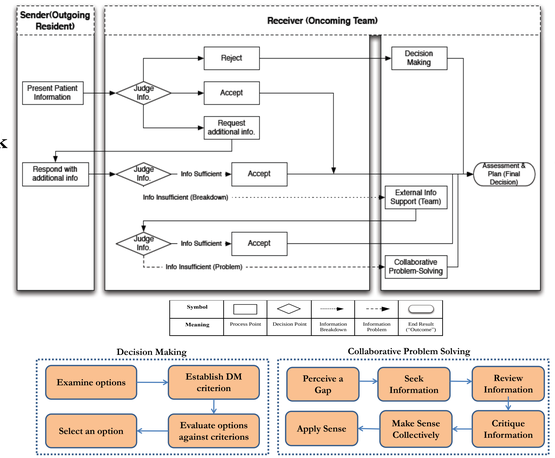
Data Source	Method of Analysis	Examples of Codes
Shadowing and interview notes	Grounded Theory (a) Open coding (b) Axial coding (c) Selective coding	Open coding: *Information exchange:* patient assessment, vitals, intubation details. *Actors:* Outgoing team, Oncoming team *Handoff presentation format* (Outgoing presents information) *Feedback loops* (Oncoming asks questions, accepts information) *Interaction and types* (attending to outgoing resident, fellow to outgoing resident), *Active participants:* (attending) *Passive participants* (oncoming team) *Handoff support tools:* EMR on COW, Progress note (prepared by outgoing), patient chart Axial coding: Communication event types Decision choices Information breakdowns (gaps) Selective coding: Handoff is comprised of communication events. A handoff communication framework that illustrates the team interactions in the process
Audio-recordings	(1) Structured coding template	Handoff communication framework – Communication breakdowns and problems Workaround and decision making activities
	(2) Question analysis (manifestation of information needs) using on Ely's[2] and Lehnert's[3] taxonomies	Type of questions (diagnostic evaluation, treatment, management, non-clinical questions, patient-specific and miscellaneous) asked by oncoming clinicians Form of questions (concept completion, verification, goal orientation, causal antecedent, quantification, disjunctive, procedural, feature specification) asked by oncoming clinicians Communication breakdowns in relation to the failure to respond to questions

Preliminary Results

1: Content and Structure of Handoff Communication

Communication Events in Handoff Tool
MICU Day #, Vent Day #, Problems, Lines, Drips, Nutrition, Prophylaxis
Events, ROS
PE: Tm, BP, MAP, HR, RR, I/O
Vent: rate, Vt, PEEP, FiO2, % Peak P, AutoPeep
ABG, Gen: Intubated – Y/N
Psych: Sedated/ Agitated/ Calm
Neuro: Sedated/ Confused/ Alert-Awake-Oriented
HEENT: Pupils equally round and reactive to light – Y/N; GAG – Yes/No, Secretion –Yes/No
CV: Rhythm –Regular/ Irregular, Rate- Normal/Tachycardic Murmurs –Y/N, Systolic, Diastolic, Location: …. Radiaton
Lung: Clear to Auscultate Bilaterally –Y/N; Crackles –Y/N; Wheeze-Yes/No, labored – Y/N
Abd: Bowel sound- Y/N; Soft/hard; Distended –Y/N; Rash: Yes/No; Tender- Yes/No
Ext: Clubbing –Y/N; Cyanosis- Y/N, Edema –Y/N; Pulse- Y/N
Integument: Rash: Y/N
GU: Foley –Y/N; Lesions Y/N; Discharge-Y/N
Labs, cultures
Chest X ray Other Imaging
Assessment and Plan (a) Neuro, (b) Endocrine, (c) Resp, (d) CVS, (e) GI, (f) Renal, (g) I.D., (h) Heme, (i) Other organs, (j) Prophylaxis

Handoff Framework in the MICU



- A single patient handoff is comprised of 15 communication events
- Handoff is interactive and prone to information breakdowns
- **Complexity in the handoff activity arises due to several factors**
  - **Multiple information flow paths**
  - **Uncertainty in information**
  - **Team interactions**
  - **Collaborative problem solving and decision making**
  - **Pragmatic nature of the environment**

2: Information Seeking Behavior during Handoff Communication

Type of Question	No. of Questions (n = 283)	Prominent Form of Question	Information Breakdowns
Diagnostic Evaluation (factors related to diagnosis)	**83**	Concept Completion (Who? What? When? Where?)	5
Treatment (ongoing treatment)	82	Verification (Did the nurse give X?)	**18**
Management (assessment and plan of care)	78	Judgmental (What do you think of X?)	3
Patient-directed (information from patients)	4	Concept Completion	0
Non-clinical (administrative issues in care)	24	Concept Completion	0
Miscellaneous (other)	12	Concept Completion	0

- Diagnostic evaluation, patient-directed, non-clinical, and miscellaneous types of questions were related mostly to concept completion
- Treatment type is comprised of most information breakdowns
- **There is inadequate support provided by the current handoff tool to address information needs of oncoming teams**
- **To minimize handoff communication breakdowns, we need to account for the information needs of oncoming teams in our standardization efforts**

Conclusion

1: The handoff communication framework

- Is *a promising first step for examining the communication events* during critical care transitions
- Highlights *two critical activities* in group handoffs: (1) outgoing team-driven information presentation and (2) oncoming team-driven learning and explanation activity
- Presents *opportunities to evaluate* handoff communication outcomes; *to study* how handoffs contribute to workflow complexity in critical care settings; and *to identify* the different factors that result in information flow breakdowns

2: Analysis of information seeking behavior during handoffs can

- Assist in *developing a program in training* care providers to seek the right information prior to handoff
- Characterize the *cognitive process of the individual asking the question*, which can help in developing a conceptual framework for studying information seeking and giving patterns in handoffs
- Refine the *design of handoff tool* based on the categories of information needs
- Develop effective learning strategies for linking questions and answers

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