

Introduction

- Much of healthcare depends on distributed teams of clinical providers [1]. However, health information technologies (HIT) generally fail to support clinical teams in areas such as communication, collaboration, coordination, and temporal awareness [2].
- Emergent features of teams, like communication through interruptions, require support.

INTERRUPTIONS

- Interruptions are an inherent team activity as they are a form of coordination and communication between team members.
- While unnecessary interruptions have the potential to lead to increased patient risk [3], some interruptions are in fact necessary [4].
- US Emergency Department (ED) Physicians are interrupted on average 10 times per hour and ED Nurses are interrupted at a rate of 1 interruption every 4.5 minutes [3, 5].
- Interruptions have been examined considering rate of interruption, interrupted activities, and those receiving or initiating interruptions.
- *For this project, we use a work design method to delve into the content of interruptions to determine their function with the goal of redesigning communication practices to better align team roles and responsibilities.*

Methods

DATA COLLECTION PROCEDURE

- **Setting:** ED teaching hospital in a major metropolitan area
- **Participants:** Six Attending Physicians
- **Data Collection:** Ethnographic observation of two shifts of four hours each

DATA ANALYSIS

- Interruptions that occurred as part of work were isolated and coded for the participants involved, tasks interrupted, function of the interruption, and other similar features.
- These results were classified based on previous literature to the type of care interrupted, Direct or Indirect Care, Initiator and Recipient of the interruptions, as well as the function of the interruption as Overhead or Domain-type (Table 1).

Results

- 754 interruptions in which Attending Physicians were either the Recipient or Initiator of an interruption ($M = 17.14$ per hour, $SD = 4.86$) were observed.
- 78% of these interruptions occurred during Indirect Care activities such as charting.
- Only 8% of interruptions occurred at the patient's bedside.
- Attendings received interruptions from Residents (41%), Nurses (13%), and Consulting Physicians (28%).

OVERHEAD AND DOMAIN INTERRUPTIONS

- 22% of the interruptions were classified as Overhead-type interruptions unnecessary to the work process which can impede optimal patient care (Figure 1).
- Common Overhead interruptions were: Finding misplaced clinicians; Relaying information to other clinicians; Charting problems (technical issues); Repetition of tasks completed by other clinicians.
- Attendings were the Recipients of 141 Overhead-type interruptions suggesting that other team members, such as Residents (37%), transferred responsibilities unnecessary to the Attendings' work process to the Attendings' list of tasks which can delay patient care (Figure 2).
- As Initiators of Overhead interruptions, Attendings dealt with technical issues (39%) inhibiting their workflow and delegated tasks to or monitored Residents (26%) (Figure 2).

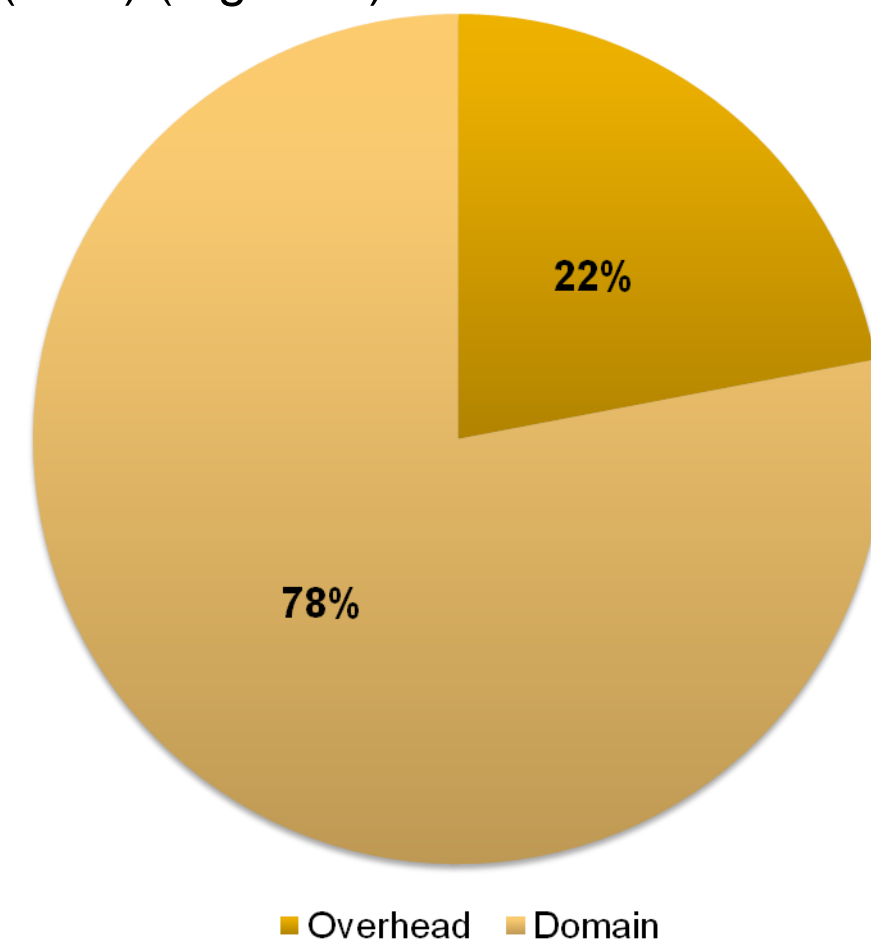
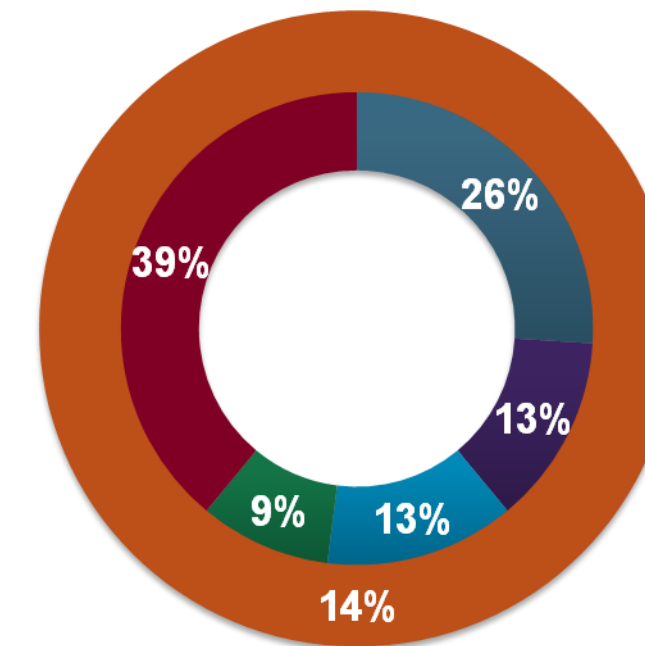
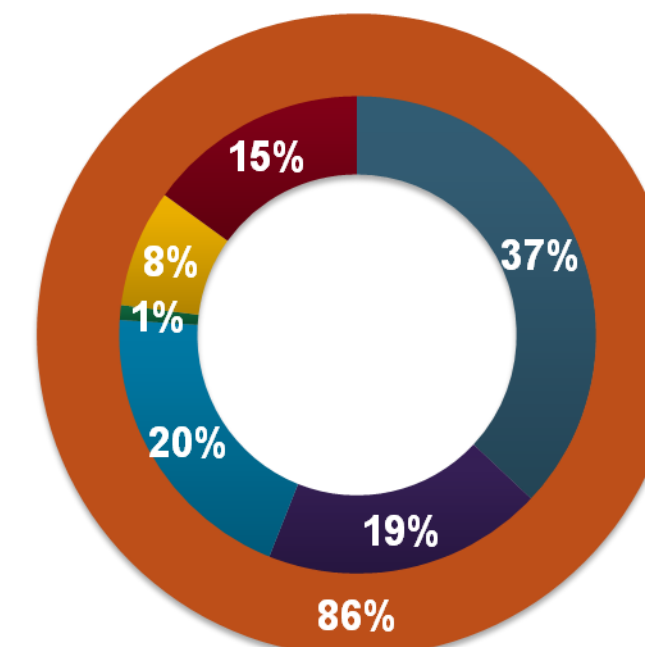


Figure 1: Interruptions by work domain type.

Attendings as Initiators (14%)



Attendings as Recipients (86%)



- Residents & Physician Assistants
- Nurses
- Patients & Families
- Consulting Physicians
- Technicians & Administratives
- Other (Technology, etc.)

Figure 2: Breakdown of Overhead interruptions by role as an Initiator or Recipient.

Table 1. Terms and definitions used to classify interruptions.

TERMS	DEFINITIONS
Interruption	A break in the performance of a human activity initiated by a source internal or external to the recipient. This break results in the suspension of an initial task to perform an unplanned task which results in a break or termination of the primary task [4].
Indirect Care	Care delivered for the patient, but not at the patient's bedside (e.g., Data Analysis, Charting, Reporting) [3].
Direct Care	Care delivered to the patient at the patient's bedside (e.g., Surgical Procedure) [3].
Initiator	A person who initiates an interruption [6].
Recipient	The person to be interrupted [6].
Overhead	Interruptions that are not clinically dependent and create disturbed work processes (e.g., Technology Workarounds). Often caused by the implementation of poorly designed systems or workflow methods [7].
Domain	Interruptions necessary for the completion of clinical tasks and create undisturbed work processes (e.g., Interpreting EKGs) [7].

Discussion

- Examining the content and function of interruptions reveals that assistance is needed to manage Overhead interruptions often initiated during Indirect Care and directed towards the leader to complete tasks unrelated to the work process and their role and responsibility to the team.
- Nearly a quarter of all interruptions are Overhead interruptions (*i.e.*, finding clinicians to relay information or technical problems) and should be removed.
- Team interruptions like interpreting EKGs, patient notifications, and communication between providers need further support.

Summary of Conclusions

- We demonstrate a need and a new way of understanding collective effort by modeling a team activity like interruptions according to content and function. Our model shows that 22% of interruptions are unnecessary. The remaining two-thirds are forms of team activity. Such system-based communication and coordination may require additional support.

References

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