

A Computing Platform to Support Communication and Sense-Making in Intensive Care

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Abstract

We developed a conceptual design of a mobile computing platform to support multi-disciplinary rounds in intensive care units.

Introduction

Activities in intensive care are highly collaborative and inter-dependent. Adverse events in such settings have frequently been attributed to errors related to communication.¹ Studies have demonstrated that multi-disciplinary rounds are important for care coordination, resulting in error reduction and care cost-effectiveness.² Despite the fact that increasing amount of data in healthcare is available in electronic medium, how computers may be used to improve communication are poorly understood. For example, computerized handoff tools have shown to be useful in reducing omissions and time spent in preparation for communication among care providers.³ To explore the role of computers in supporting communication among care providers and in promoting joint sense-making, we developed a conceptual design of a mobile computing platform.

Method

We conducted observations of multi-disciplinary rounds in two intensive care units (pediatric and neuro-trauma), with the objective of developing general principles for a mobile computing platform that may be used during rounds. In these two units, mobile computers were used as well as desktop computers during rounds. The communication patterns were analyzed to extrapolate the desirable features and constraints for deploying computing technology during time-pressured face-to-face encounters.

Results

Key design principles for a computer platform (Rounding Partner) were developed and include support for preparatory activities, random and rapid access to visuals, and shared views on a mobile platform that could be easily pushed aside to allow

unobstructed inter-personal interactions. Based on the principles, a bench-top prototype of Rounding Partner was constructed for exploration both in laboratory conditions as well as in actual patient care (Figure 1). The key concept in the design was "bundle,"⁴ the result of data processing activities. Rounding Partner was designed to support the capture of data during pre-rounding preparation as digital bundles that could be later used during rounds.

Discussion

Previous studies of communication during rounds have not examined the role of supporting artifacts.⁵ Our efforts were focused on artifacts and uncovered a set of potential roles as well as pitfalls in using computing technology during rounds. On-going development of Rounding Partner and in-situ field experiments will further refine design principles.

* Supported by NSF (0534646)

References

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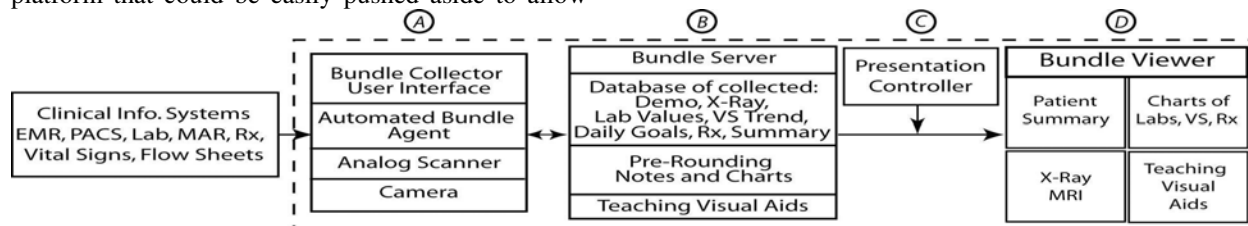


Figure 1. System architecture for Rounding Partner. Interactions with clinical information system were primarily carried out during pre-rounding preparatory phase. A: Tablet PC with Bundle Collector software; B: Bundle Server PC for data storage; C: Wireless handheld computer for rapid control of the presentation flow; D: Multi Screens digital bundle display.