



KEY POINT SUMMARY

OBJECTIVES

This paper presents the use of human factors methods to identify user requirements and workplace design recommendations and solutions before the implementation of the first round of ambulatory EMR in the ENT and an audiology clinic of a tertiary care pediatric hospital in Canada.

Identification of EMR Hardware and Space Design Requirements Using Human Factors Analyses

Campbell, C., Kramer, C., Kelsey, S., & King, W.J. 2013 | *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care: Advancing the Cause Volume 3, Issue 1, Pages 50-57*

Key Concepts/Context

A successful Electronic Medical Records (EMR) implementation depends on factors that impact user experience, such as access, information management, documentation, patient privacy concerns, and potential interference. The authors allude to the significance of the selection of hardware and its placement as key to an efficient EMR workflow. Through this study user requirements were identified for the type of hardware required and how to place it in the existing clinic layout. The hardware and design recommendations were based on (among others) two requirements that could be met through design strategies: maintaining line of sight and maintaining privacy.

Methods

This study involved the use of the following qualitative methods: ethnographic observation, interviews, scenario development, task analysis, and gap analysis. The information from the interviews and observations was used to develop two workflow scenarios. These scenarios were subject to task analysis to come up with user requirements, and this underwent a gap analysis (for example: an information gap –pre-EMR – a patient chart outside an exam room meant a patient was waiting to be seen. Electronic charts meant there was no visual cue to indicate a waiting patient, causing a gap in clinic coordination) that led to recommendations for hardware and placement.

Findings

Without changing the existing physical layout of the clinic, the task and gap analyses resulted in 24 recommendations. Each of these hardware and design recommendations were customized to the specific space and task.



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These recommendations were based on, among others, two requirements that could be achieved through design strategies:

- Maintaining a line of sight with patient/ provider while documenting
- Maintaining privacy and confidentiality

Procedure room: Sit/stand wall-mounted computer with adjustable arm extension that can be folded to be flush with wall to make space for procedures. Designed so that there is access for patient and family seating and for provider to maintain line of sight with patient and family

Audiology therapy and test rooms: Standard computers with height-adjustable monitors in all therapy and most test rooms. In some test rooms (per requirement) computer workstation designed so that provider can maintain line of sight

Hallways: Shared workstations where work schedules can be accessed, thus omitting the need for the visual cue of the patient chart

Physician-Staff room: A wall-mounted display of the shared schedule

Design implications

When incorporating computer hardware into the design of clinic rooms, the following requirements may be considered:

- The provider is able to maintain line of sight with patient and/ or family while documenting.
- The provider is able to maintain the privacy and confidentiality while documenting.

Limitations

The authors mention limitations that were pertinent to the project, and not the study:

- Budget constraints that did not have scope to make any changes to the existing infrastructure and layout of the hospital
- Mobile devices and Workstation on Wheels (WoW) were discouraged because:
 - The EMR interface was designed for a 24" monitor; information would be truncated on screens smaller than 15".
 - The vendor recommended wired, as opposed to wireless, access points to maintain real-time database updates and data integrity.