



## KEY POINT SUMMARY

### OBJECTIVES

The objective of this research was primarily to design an inexpensive, environmental intervention that would reduce interruptions during med prep in a pediatric acute ward of a children's hospital.

### DESIGN IMPLICATIONS

A design implication that can be inferred from this study is:

Cordoning off a section of an open design workstation may be considered as an effective intervention for interruptions.

## Designing for distractions: a human factors approach to decreasing interruptions at a centralized medication station

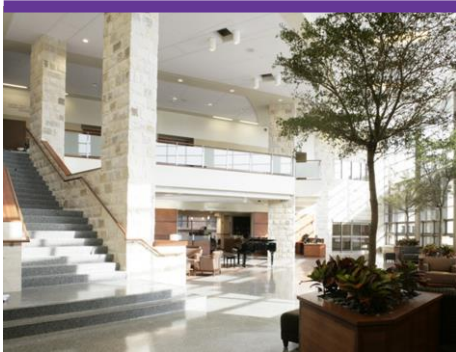
Colligan, L., Guerlain, S., Steck, S.E., & Hoke, T.R. 2012 | *BMJ Quality & Safety*. Volume 21, Issue 11, Pages 939-947

### Key Concepts/Context

According to the authors, literature indicates that interruptions during the administration of medication in healthcare settings can lead to errors, and that such errors are likely to cause more harm in pediatric settings. The medication station in the study hospital is centrally located with an open design targeted to reduce nurse walking and increase time with patients. Its open design allows for both patients and monitors to be continually observed. It also allows the nurse to be interrupted mid-task, especially during the preparation of medications. This study, conducted in three phases, involved the installation of a barrier in one section of the medication station. The last phase evaluated its efficacy. The study found that the barrier helped in the reduction of interruptions during medication preparation (med prep).

### Methods

The research progressed in three phases: 1) evaluation of the existing medication station and tasks for safe med prep, 2) design of the intervention, and 3) determining the effectiveness of the intervention. The methodology in the first phase involved shadowing nurses while they prepared medications for hypothetical patients, semi-structured interviews with nurses, and participant observation during peak medication administration hours. The findings from Phase 1 were used to design the intervention in Phase 2. For Phase 3, six months before implementation of Phase 2, pre-intervention data was collected, and post-intervention data was collected six months after implementation. This data pertaining to nurse perceptions and number of interruptions was collected by a paper-based questionnaire. Nurses were also observed by researchers during peak med prep times and the medication area was video recorded. The survey data was subject to statistical analysis.



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## Findings

At the end of Phase 1, the researchers found that:

- The open design of the medication station was beneficial as it promoted nursing collaboration, communications, ability for staff to view whiteboard and alarm stations, and availability to parents.

In Phase 2, 24-inch high walls made of frosted glass were placed on the corner of the medication station where med prep was performed. The endpoints of the barriers were determined by the nurses' requirement of having visual access to the whiteboard, monitors, and the ward secretary. The placing of these barriers was such that the sight lines to the patient rooms and staff workspaces were clear.

At the end of Phase 3, the researchers found that installing barriers around a section of the medication station yielded the following:

- The number of interruptions ranged from 0-12 per occurrence of med prep.
- Each interruption lasted between 20 to 720 seconds.
- The rate of interruptions per minute per occurrence of med prep reduced from 1.4 during the pre- intervention to 0.27 in the post-intervention period ( $p < 0.01$ ).
- The length of time spent in one med prep decreased from 120 to 117 seconds.

## Limitations

The limitations of this research identified by the authors were as follows:

- The behavior of the participants during the observations and interviews may be changed because of the fact that they are being observed.
- This study focused on interruptions during med prep and administration only. The findings of this study cannot be applied to all medication errors.
- The codings of the interruptions were subjective.

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