

Attitudes toward LEAF patient monitoring sensors for turning patients in an academic intensive care unit (ICU)

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Introduction & Background

To explore the human-technology frontier in healthcare, our group divided into four thematic streams, one of which used qualitative methods to learn about worker experience, concerns, and preferences around technology in the setting of an academic intensive care unit (ICU). As part of these efforts, LEAF patient monitoring sensors (Smith + Nephew, London, UK) were mentioned in several interviews. The study presented here aims to understand the attitudes of workers toward this recently implemented technology.

Manual turning is common practice for reducing the risk of pressure ulcers in non-ambulatory hospitalized patients. LEAF sensors are single-use devices adhered to a patient's torso (Figure 1) that can monitor for adequate turns. In best-use scenarios, the sensor can detect whether patients have been turned within the prescribed timeframe as well as to a sufficient angle.



Figure 1 - The Leaf sensor. Image from <https://www.sn-leaf.com/>

Methods

We conducted qualitative semi-structured interviews of ICU personnel. Our interview guide was designed to gather data broadly about attitudes toward technology in the ICU.

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Methods (cont'd)

Interviews were conducted by a single team of two experienced interviewers.

Our initial round of interviews included 20 participants: 5 physicians, 4 bedside nurses, 4 manager/administrators, 4 advanced practice providers, 1 pharmacist, and 2 physical therapists.

Initial thematic analysis for this study was performed by a single reviewer who did not participate in the initial round of interviews. We applied Argyris's Ladder of Inference in interpreting the emergent themes (Argyris, 1990).

Preliminary Results

Technology involved with turning patients (i.e. LEAF, lifts, or bed alarms) was mentioned in 14 of the 20 interviews.

Three initial themes arose from the first round of interviews:

1. Desire for technology that *helps do* the job, not a *reminder to do* the job
2. Technology that meets the needs of the *problem*, but not the needs of the *users*, interferes with other processes
3. Acceptability of monitoring technology as a data collection tool that supports human systems and patient care

Note: we do not feel we reached saturation in our first round of interviews.

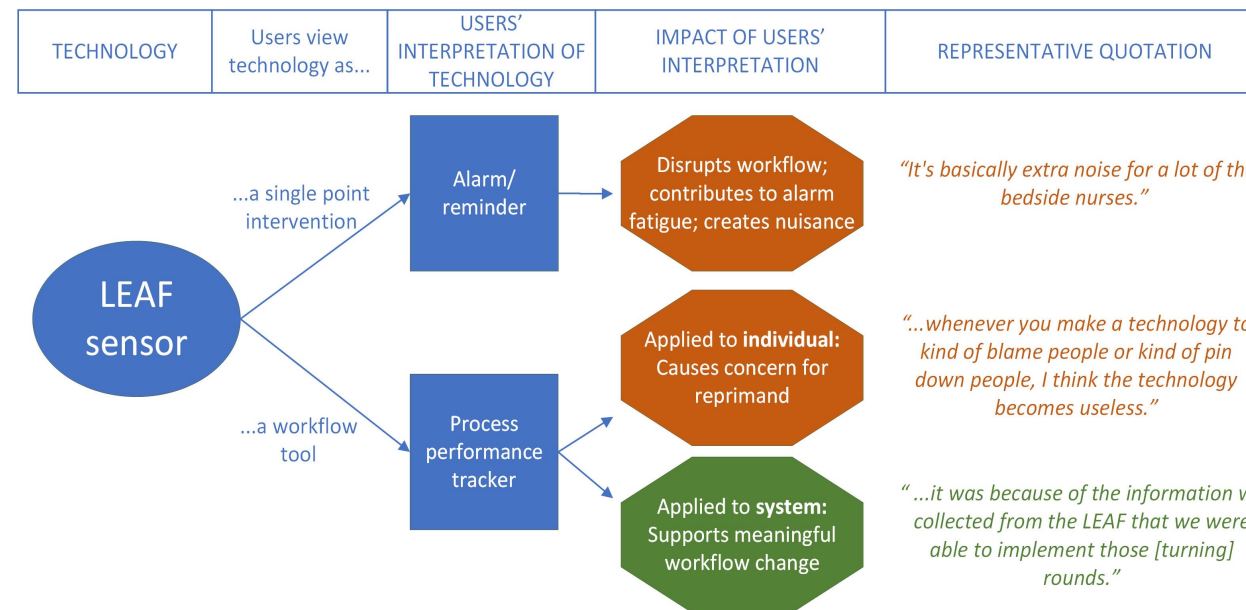


Figure 2 – Initial Conclusions.

Initial Conclusions & Next Steps

New technologies may have highly variable outcomes depending on their implementation. Our work is ongoing, but through user experience interviews with LEAF, we see that one technology may impact work in both disruptive (orange) and supportive (green) ways (Figure 2).

When users view LEAF as an intervention itself to affect the outcomes of a process, then they interpret its use as an alarm that creates a disruption or nuisance. However, when they view the technology as a tool *within* their workflow, they

interpret it as something that can track the performance of a process. When applied to individual users, the tool creates concern for reprimand; but when applied to the system overall, the tool can support meaningful workflow changes.

We plan on returning to the ICU for follow-up interviews specifically about LEAF since our first round asked general questions about experiences with technology. We also plan to interview members of the LEAF adoption and implementation teams.