

PROTOTYPING A MOBILE APPLICATION FOR ANESTHESIA ASSISTANTS

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Background: At BC Children’s Hospital, anesthesia assistants (AAs) help the attending anesthesiologist to keep the patient safe by ensuring that equipment and tools are maintained and readily available, and by providing an “extra pair of hands” when needed. However, requesting their presence using a phone-based paging system is cumbersome and hard to perform from the anesthesia workstation. Therefore, an integrated mobile application facilitating information exchange and communication tasks (such as paging) is proposed.

Method: Participatory user-centered design¹ with three AAs (comprised of shadowing an AA for two shifts, semi-structured interviews, and rapid-prototyping display elements) was used to develop a mobile application prototype. Cognitive Work Analysis^{2,3} was used to develop hierarchical models, which were used to guide the design.

Results: An overview of a preliminary Work Domain Analysis (Fig. 1) highlights the balances, general and physical functions, and sensors required to complete the frequent tasks. The highlighted “aid with intubation” task demonstrates the different ways a task can be initiated: For example, a) a request (page) sent by the anesthesiologist, b) a reminder based on the anesthetic phase, or c) by the AAs themselves looking at the room overview page.

An example of a potential overview screen, consisting of the room number, anesthetic phase and three vital signs (HR, SpO₂ and etCO₂) is seen in Fig. 2a. An example of an urgent request page, with location information as well as captured vital signs, can be seen in Fig. 2b.

Discussion: Work Domain Analysis was found to be a useful technique to structure information obtained in a user-centered design process. It allowed identification of the minimally needed information, interaction between display components, and support for the most commonly performed tasks. Three AAs involved in this project see high potential for the application to improve their workflow and communication with other providers in the OR.

Conclusion: The described mobile application provides an easy method of information exchange and communication of, for example, vital signs, paging and chat messages. It has potential to improve situational awareness⁴ of AAs, thereby improving patient safety. Future work will include refinement of the prototype, implementation of the interface on an iPod touch (Apple, Cupertino, CA), followed by an evaluation in normal clinical practice.

References:

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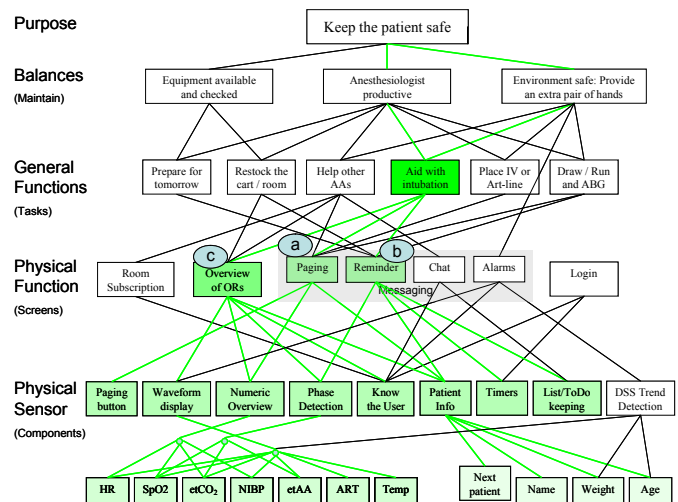


Figure 1: Work Domain Analysis for anesthesia assistants with the “aid with intubation” task highlighted

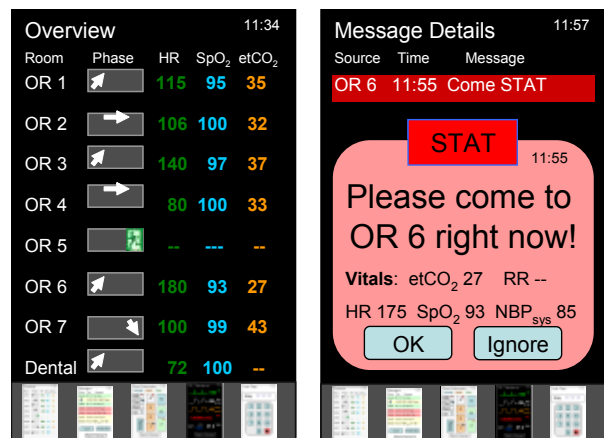


Figure 2: Overview and paging screen examples of mobile anesthesia assistant display prototype