Teaching & Training
Faculty and staff provide guidance in theories, methods and tools related to human factors through simulation-based training and assessment.

Communication & Decision Making
We investigate team communication, adaptive problem solving, cultural effectiveness, and individual and group performance-shaping factors, to generate improved clinical care processes and outcomes.

Work Analysis & Improvement
Using human factors engineering, cognitive psychology, implementation and simulation science, CRRISS studies performance during patient care to understand how and why care deviates from optimal.

CRRISS investigates the design and evaluation of medical devices and health information technology. We have collaborated with the VA, other Vanderbilt centers and outside vendors to develop and improve the user experience.

Usability Testing for Safety Enhanced Design
CRRISS researchers conducted usability validity tests (DUT) according to ANSI/ASC/ISO 11007:2003. Usability validation tests were performed to evaluate the usability of developed medical devices.

Handoff Tool Development, Implementation and Evaluation
A network of high-fidelity simulation programs offering all-day courses mandatory for board-certified anesthesiologists. Maintenance of Certification in Anesthesiology (MOC- Anesth) allows maintenance of learning competency.

Usability issues included poor access to subtasks, lack of process feedback, inaccurate error messages, and confusing device interactions.

Simulation-Based Performance Assessment
A network of high-fidelity simulation programs offering all-day courses mandatory for board-certified anesthesiologists. Maintenance of Certification in Anesthesiology (MOC- Anesth) allows maintenance of learning competency.

Usability issues included poor access to subtasks, lack of process feedback, inaccurate error messages, and confusing device interactions.

Cognitive Aids to Support Emergency Situations in Pediatric Surgery
This study aims to improve operating room emergency response by reducing risks associated with errors in data entry and omissions in the delivery of care during pediatrics emergencies. Simultaneous use of technologies in this form of cognitive aid have been tested as a potential solution to optimize monitoring and fail-safe standards of treatment that occur during crisis situations.

Design & Usability
CRRISS investigates the design and evaluation of medical devices and health information technology. We have collaborated with the VA, other Vanderbilt centers and outside vendors to develop and improve the user experience.

Pre-op UI Redesign
Current Application
- Unstructured knowledge entry process
- No awareness of risk
- Cannot query information
- No clear patient status indicators
- No clear role status indicators
- Restrained UI
- Proprietary disclosed
- No awareness of risk
- Cannot query information
- No clear patient status indicators
- No clear role status indicators

Usability issues included poor access to subtasks, lack of process feedback, inaccurate error messages, and confusing device interactions.

CRRISS conducts usability testing to evaluate the usability of developed medical devices.

Clinical practice frequently varies from optimal care, yet medical errors are reported in up to one-third of cases. Patient harm is often not reported. We introduced two post-surgical checklists as part of the High-Risk Event (HRE) model, modeled after surgical procedures in the operating room, to reduce deviation from standard operating procedures (SOPs) and decrease errors. We introduced a protocol for documenting unexpected events observed by clinicians or trained observers during surgery or ICU admission for post-surgical adverse events. We documented unexpected events and analyzed them for the purpose of identifying strategies for improving care in the clinical situation.

In a series of studies, we have shown that perioperative clinician reported NREs (1) are frequent (in 1/4 to 1/3 of cases), (2) constitute a wide array of system failures, and (2) are associated with increased clinical workload and with significant patient physiological and outcome related problems. The checklist provides a on system safety and can be used in a dependent variable in safety interventions.

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