New technologies for information retrieval to achieve situational awareness and higher patient safety in the surgical operating room: the MRI institutional approach and review of the literature.

Abstract:
Technical progress in the operating room (OR) increases constantly, but advanced techniques for error prevention are lacking. It has been the vision to create intelligent OR systems ("autopilot") that not only collect intraoperative data but also interpret whether the course of the operation is normal or deviating from the schedule ("situation awareness"), to recommend the adequate next steps of the intervention, and to identify imminent risky situations. Recently introduced technologies in health care for real-time data acquisition (bar code, radiofrequency identification [RFID], voice and emotion recognition) may have the potential to meet these demands. This report aims to identify, based on the authors' institutional experience and a review of the literature (MEDLINE search 2000-2010), which technologies are currently most promising for providing the required data and to describe their fields of application and potential limitations. Retrieval of information on the functional state of the peripheral devices in the OR is technically feasible by continuous sensor-based data acquisition and online analysis. Using bar code technologies, automatic instrument identification seems conceivable, with information given about the actual part of the procedure and indication of any change in the routine workflow. The dynamics of human activities also
comprise key information. A promising technology for continuous personnel tracking is data acquisition with RFID. Emotional data capture and analysis in the OR are difficult. Although technically feasible, nonverbal emotion recognition is difficult to assess. In contrast, emotion recognition by speech seems to be a promising technology for further workflow prediction. The presented technologies are a first step to achieving an increased situational awareness in the OR. However, workflow definition in surgery is feasible only if the procedure is standardized, the peculiarities of the individual patient are taken into account, the level of the surgeon's expertise is regarded, and a comprehensive data capture can be obtained.

Zeitschriftentitel / Abkürzung:
Surg Endosc

Jahr:
2011

Band:
25

Heft / Issue:
3

Seiten:
696-705

Sprache:
eng

Pubmed:

Print-ISSN:
0930-2794

TUM Einrichtung:
Chirurgische Klinik und Poliklinik

Occurences:
- Einrichtungen > Fakultäten > Fakultät für Medizin > Kliniken und Institute > Chirurgische Klinik und Poliklinik > 2011

entries: