

Tele-Assist System for Anaesthesia

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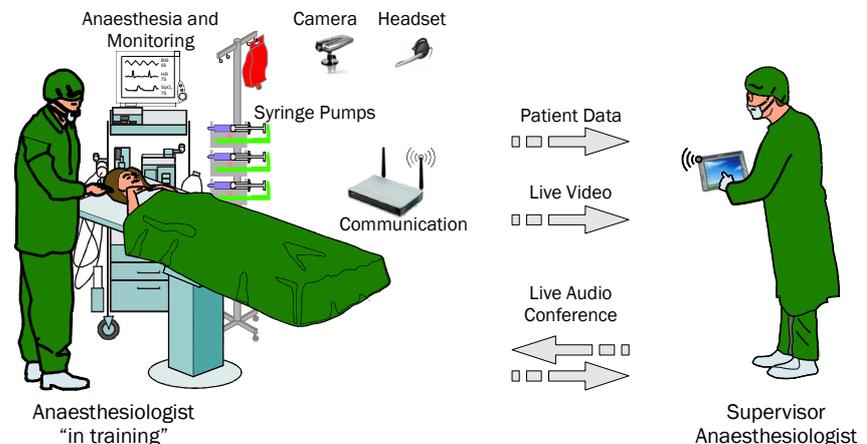
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Introduction: As economic resources become tighter, the efficient arrangement of medical working spaces within hospitals is of particular importance. Specifically in the context of teaching clinics, it is common for a novice doctor to receive supervision and guidance by an experienced colleague. In order to do this efficiently and safe, the supervisor requires comprehensive and immediate medical information about the patient. This is even more important when the Supervisor is responsible for up to 4-5 "students" at the same time. On the other hand, the increasing capabilities of emerging sensing and computing technologies allows for an ever increasing multiplicity of parameters to be monitored and adjusted. In order to handle these parameters in a manageable fashion, a central collection of vital information (physiological as well as technical) and an ergonomic display is essential.



Methods: In the scope of the "Tele-Assistant System" project, a concept for remote anesthesia monitoring has been developed and evaluated. In addition to relevant vital sign signals, all relevant data of involved medical equipment and a video image of the operation field are recorded. Several systems installed in multiple locations enable the supervisor to assess a full picture of the situation in different locations, and thus, enable him to give proper advice using evidence based data.

The System consists of a measurement server located in the OR which is connected to all available anaesthesia related electronic devices. So far we integrated a Draeger Cato Anaesthesia machine, a Datex Ohmeda AS/3 monitoring unit and BBraun syringe pumps, but the concept is open for other devices, provided



specific device drivers are implemented. For Audio/Video recording, off the shelf webcam equipment was used. Wireless data transmission is serviced by several IEEE 802.11b/g WLAN access points distributed in the OR-zone covering also wakeup room and staff area. The supervisor data terminal is a mobile DIN-A5 size tablet PC. Presentation of the data is styled after the accustomed layout of the monitoring system.

Results: The System worked in a test installation without major problems. At some occasions, when walking in between different network cells, network connection was lost but re-establishes within 15 seconds. Physiological Data, both numeric and realtime curves, can be viewed online with only 2 seconds delay. Audio and video link was very helpful in assessing current OR situation. Anaesthesia staff, both "students" and "supervisor", mostly welcomed the system although fears of an "Orwell 1984" scenario were expressed sometimes.

This work was supported by the START program of the University Hospital Aachen