Integrated Consciousness Software and Pulse Oximeter Monitor

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Technology description

Allows Patient In-the-Loop Participatory Care and Monitoring

This monitoring software is incorporated into pulse oximeters or other connected devices to assess a patient’s consciousness and/or provide instruction, allowing for remote analysis of the patient ‘s status of care and automate patient interaction. Available ward assessments of consciousness, pain or therapy require the active involvement of a clinician. Clinicians see the patient to make periodic assessments and therapeutic reminders or to respond to false alarms resulting from a patient’s movement. Spurious alarms can occur as many as 700 times per patient per day, eventually leading to "alarm fatigue," in which the clinicians become desensitized to the alarms. Available technology to determine a patient’s consciousness requires the patient to depress a switch or button. No technology in ward use reminds and audits a patient’s response to an instruction from a medical device. Researchers at the University of Florida have developed software that allows a clinician to monitor and/or instruct a patient activity using the patient’s movement. A patient can answer a question, establish consciousness, or record pain level by moving his or her finger or leg. The software also can prompt the patient to periodically move, use an incentive spirometer, etc. Researchers designed the software to be integrated into pulse oximeters, but it can be incorporated into other patient devices (e.g., IV pumps, electronic anti-embolism stockings, blood pressure monitors, ECGs, and nurse call systems) as well.

Technology

Pulse oximetry is a method used to detect blood pulsation and oxygen saturation using non-invasive optical techniques. An oximeter operates by passing beams of red and infrared light through the capillary beds in the finger. This software, integrated into a pulse oximeter or other device, prompts a patient with questions and reminders and requests responses by sensor movement, rather than by a patient actively depressing a switch or button. Sensor movement linked to a request from the software verifies a patient’s consciousness, quiets a false alarm (e.g. stop moving your hand) or triggers a change in therapy (e.g. change your position in bed to help avoid a pressure sore, wiggle your feet to help avoid a blood clot). Using this software, the oximeter will be able to register movements by

measuring changes in the plethysmogram or other auditable parameter from the engaged sensor and record them as consciousness or responses to prompts. If no response is registered, the software alerts clinicians by issuing an alarm.

Application area

Patient monitoring through integrated medical device software/hardware that prompts patient activity or assesses patient response to a question or reminder

Advantages

Minimizes the number of false alarms, decreasing risk of clinician "alarm fatigue"
Prompts patients for responses by auditing subsequent movement, providing reliable patient monitoring of consciousness and response to an instruction

Institution

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