NEEDS ASSESSMENT AND CASE SERIES: AIMS DOCUMENTATION OF ICU PROCEDURES USING WIRELESS TECHNOLOGY TO TRANSMIT PATIENT DATA

Presenting Author: Allan F. Simpao, MD

Co-Authors: Jorge A. Galvez, MD,1 Mohamed A. Rehman, MD,1 James H. Scott, CNA,2 Michael M. Hamid, Sr.CE3 Joseph Noce, CCE, CBET,4 and Richard H. Epstein, MD5
1Department of Anesthesiology and Critical Care Medicine, 2Information Systems and Biomedical Engineering, The Children’s Hospital of Philadelphia (CHOP), Philadelphia, PA. 4Biomedical Instrumentation, Thomas Jefferson University Hospital, Philadelphia, PA. 5Department of Anesthesiology, Jefferson Medical College, Philadelphia, PA.

Background: In a prior study,1 we developed and validated a simple, reliable method to record ICU anesthesia cases using wireless technology2 on a portable AIMS workstation. We present a needs-based assessment and case series of wireless AIMS documentation of neonatal ICU (NICU) procedures at CHOP. Prior to the wireless AIMS, NICU procedures at CHOP were documented strictly by paper charts.

Methods: Wireless AIMS Implementation: A Bluetooth wireless serial port adapter (BWSPA) (WCSC Inc., #HDWBTRS232) was used to transmit patient’s vital signs and ventilator data from the bedside monitor (GE Solar 8000i) to a portable AIMS workstation that recorded the vital signs every 15 seconds. The BWSPA was paired and configured using a PC Hyper Terminal application. One of the modules was connected to the GE Solar’s RS232 port and the second to the AIMS workstation through an M4/DAC box (data acquisition switch, Baytech Inc). The distance between the patient monitor and AIMS workstation was 15-20 feet. To test for interference, with no patient present, we activated an FX2 Valley Lab electro surgical generator between the wireless links during data acquisition. The electro surgical generator was set at max monopolar coagulation power then activated over the return pad.

Needs Assessment: A paper survey was distributed to attending pediatric anesthesiologists at an information technology committee meeting held at the American Society of Anesthesiologists 2012 Annual Meeting in Washington, DC. Survey forms were collected the same day.

Results: Wireless AIMS implementation: Three NICU surgical procedures were documented via the wireless AIMS. No data gaps were detected in any of the three cases, and there were no issues from a wireless, technical, or ergonomic standpoint. Provider feedback was uniformly positive. There was no data limitation on the number of vital signs collected by the bedside monitor. Testing showed that the wireless modules had the capability of transmission up to 100 feet as a maximum direct distance. The data collected by AIMS during continuous activation of the electro surgical generator had no gaps during 5 seconds acquisition periods, which was a clear indication of no interference.
Needs Assessment: Ten completed surveys were collected. Each survey was from a representative of a different pediatric hospital. All ten respondents had an AIMS installed at their institutions. The mean number of yearly bedside ICU procedures was 96. Four institutions recorded bedside procedures in their AIMS, while six did not. Nine respondents said that they would use a simple wireless connection to connect the patient monitor to an AIMS, while 1 declined.

Discussion: Our previous analysis determined that a wireless AIMS system provided a simple, feasible solution to logistical problems associated with documenting AIMS records in the ICU. Implementation of the system in an ICU has replaced paper documentation with an unobtrusive, reliable, portable AIMS with all of its attendant benefits (e.g. ease of future retrieval of procedural and physiological data).

References