Abstract:

Introduction: More accurate and efficient measures of nursing time allocation are needed to better understand the relationships between nurse staffing and patient outcomes and establish evidence based staffing guidelines. Real time location system (RTLS) technology traditionally used for retail and hospital inventory management is now being adapted to track movement of staff and patients in hospitals. This technology yields a “movement history” that includes an electronic date and time stamp as individuals move from one location to another. The duration of time spent in any monitored location (e.g. patient rooms, nursing station, medication room) by any monitored individual (e.g. nurse, supportive staff) can be derived from this movement history.

Method(s): A pilot study to validate the accuracy and usefulness of this electronic measure of direct nursing time (defined as time spent by nursing staff in a patient room) was completed on three medical surgical nursing units in a single facility. RTLS equipment was installed and calibrated to capture clinical staff movement and time in patient rooms and common public areas on each unit for seven consecutive days. The validation process included a descriptive analysis of movement histories and comparison of the electronic measure of direct nursing time with direct observation in both simulated and real life settings.

Results: The data generation process yielded over 175,000 time stamps across the three units. Initial inspection of the movement histories indicated a high incidence of suspected artifact among the time entries (75%). Significant data scrubbing, involving generation of decision algorithms, was required to remove probable artifact and isolate signal entries. The high degree
of artifact was attributed to equipment sensitivity settings, position and type of RTLS receiver
tags, and limited number of monitored locations within each unit during the study.

**Discussion & Conclusions:** Electronic capture of nursing time and movement may ultimately
yield valid nursing time metrics, but further adaptation of equipment and development of
empirically tested algorithms to enhance the signal to noise ratio of the output are indicated
prior to widespread application for research purposes.

**Abstract History:**
This abstract has not been presented or accepted for presentation in whole or in part at the SNRS
or other scientific meeting.

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