Relocation of IV Pumps During COVID-19 Pandemic to Minimize Room Entry

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In early 2020, the unknown elements regarding spread and severity of the COVID-19 pandemic caused stress and anxiety amongst the healthcare team at UC San Diego Health (UCSDH). Additional nursing units were asked to care for COVID-19 patients as the number increased. Healthcare providers' risk of exposure and the implications for personal and familial wellbeing were a large source of worry. Nurses are at patients' bedsides frequently and for a longer duration than other healthcare workers; therefore, the shortages of personal protective equipment (PPE) amplified feelings of concern. As a result of the continually changing environment, regulatory bodies waived various requirements (reduced staffing during intubation, reuse of PPE, modification of work areas), and new internal UCSDH policies were developed. Social media became a popular forum for healthcare workers to share new knowledge and ideas about the novel virus. One idea that captured the attention of UCSDH ICU staff was moving the intravenous (IV) pumps outside of the patient rooms by using extension tubing. Photos of this practice idea were shared by hospitals across the country on different social media platforms.

Cassia Yi and Laura Chechel assessed the unit environment, IV pumps, and feasibility of this practice implementation. A practice guideline was developed to move IV pumps outside of the patient rooms. This guideline outlined the need for extension tubing, assessment of the IV with each room entry to ensure safe infusion, and delineated the medications appropriate for this venture. The intent was to reduce room entry frequency by nurses for alarms, IV bag changes, and titrations. We hypothesized hypothesis this practice change would reduce exposure and PPE use. The guideline was sent for approval, where concerns were voiced regarding risk for central line infection, extravasation or infiltration, and necessity. A literature review was performed and the team noted there were no publications on the safety and efficacy of this intervention. Considering the concerns and the lack of literature, this implementation was turned into a quality improvement project. The project was submitted to IRB and was approved.

From April to May of 2020, the IV pumps were moved out of airborne and contact isolation rooms for COVID-19 patients in one 24-bed medical surgical ICU. Nurses were asked to document IV pump interventions and adverse IV events each shift. Adverse IV events included IV infiltration and unintended disconnection. Events were compared between those that occurred with the pump inside the room to those

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with the pump outside of the room. A retrospective analysis was also performed to compare the number of Central Line Associated Blood Stream Infections (CLABSI) from the same time period in 2019 to the number of CLABSIs during the intervention period.

During the 6 week intervention period, there was a total of 3,428 interventions to IV pumps located outside of the patient rooms and 5,507 interventions performed to pumps located inside patient room. There were fifteen noted adverse IV events during this time, seven IV tubing disconnections and eight IV infiltrations. Eight of the events occurred with the IV pump at the patient's bedside and two with the IV pump located outside of the room. 5 were of unknown origin. During the intervention period, there were a total of 0.49 CLABSIs per 1,000 patient discharges in the medical surgical ICU studied. During the same period in 2019, there were a total of 1.08 CLABSI per 1,000 patient discharges. Based on the average daily census and the number of responses received, the data showed no increase in adverse IV events or CLABSIs when the IV pump was relocated to outside of the patient room.

PPE donning and doffing were observed and timed. On average, RNs took two minutes to don or doff the required PPE to enter a COVID-19 room. This average was used to calculate a total of 171.4 hours of nursing time saved and exposures inside the room were reduced by 3,428 during the six-week study period. The reduction in use of PPE saved over $7,000 in PPE costs. The cost of the added extension tubing was minimal in comparison at $288 total over 6 weeks. Nurse satisfaction was not evaluated, but during the trial the nurses expressed feeling cared for and gratitude.

The results showed moving IV pumps outside of patient rooms could be executed safely and effectively. As a result of this project, the original guideline was approved for implementation and the practice change was adopted. This practice is still in effect today in the medical-surgical ICU. Other levels of care have expressed interest in implementing this practice and a subsequent project is being considered.

COVID-19 has forced organizations and clinicians to think outside of the norm and use innovative processes to care for a new patient population. Moving IV pumps outside of patient rooms was a disruptive change that effected standard practice and caused a reevaluation of regulatory and infection control practices. This project showed that creative thinking can lead to practical innovations and new best practices that are safe and cost-effective.