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Reducing Errors Through Implementation of Standardized Electronic Order sets in the Intensive Care setting

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Introduction of the Problem

The project's primary aim was to convert current paper order sets over to electronic order sets to streamline workflow, reduce errors, and improve the quality of care in the intensive care unit. A secondary goal was to evaluate nursing knowledge in electronic order sets and re-educate the use and functionality. The organization identified several errors related to using paper order sets through an error reporting system. The defined process for placing paper orders was to have the provider complete the paper order set and put it into the chart. Nursing would then transcribe those orders electronically, one by one, with the pharmacy placing medication orders. A delay in care or omission in care was noted to have occurred when staff was unaware that paper orders had been placed in the chart. If verbal communication between nursing and providers delays were found to be a couple of hours, but if communication had not occurred, uncertainties were found to be from a few hours to even days. Other errors found related to paper ordersets were that the unit had outdated versions of the orderset available on the unit that did not contain updates or new evidence-based practices. Furthermore, it was found that education needs related to the functionality of electronic powerplans were lacking due to staff turnover. The project's scope was to convert the last three remaining paper ordersets to electronic in the intensive care unit setting, monitor for adoption, and reduce the error rate by 25 percent.

Literature Review

The literature review found that CMS guidelines dedicated that providers order 60 percent of their orders electronically through computerized provider order entry. The literature supported the use of electronic ordersets as evidence has shown that evidence-based ordersets use standardization to increase the quality of the orders by ensuring all the parameters for treatments and orders had occurred. Through the use of the EMR, the risk of errors was reduced through clinical support decision tools and helped achieve guidelines set by the Center for Medicaid services and meaningful use.

Articles reviewed during the literature review provided several critical topics about using standardized electronic ordersets. The first was processes to create standardized regimens. When creating standardized regimens or ordersets, key stakeholders should thoroughly review and vet them before implementation. These reviews should take a collaborative and multidisciplinary approach to ensure that all aspects of patient care and patient advocacy are considered. The proper steps advised included first looking at the current guidelines and practices at a national level, then organizations should take their proposals through governance councils for approval.

Research also supported that negative consequences also surrounded the use of electronic ordersets. Standardized ordersets provide providers recommendations, but ultimately providers have varying practices, and electronic care plans were optional. Ordersets that were available and not used then created legal risks when they were not used, and adverse outcomes occurred. Another negative is that electronic ordersets need to be reviewed and maintained regularly. Paper allows for revisions to be made by anyone as they were done on a word document. Electronic ordersets had to be scanned and then submitted to individuals with specialized skill sets to modify electronic ordersets. Electronic order sets also created additional challenges in that communication barriers occurred and time challenges when urgent changes were needed.

Benefits of using electronic were found as well. Ordersets allowed for guidelines for specific care processes such as admission or disease processes. Benefits to the patient were decreased length of stay, reduced morbidity, and mortality, and allowed for guidance in evidence-based care.

Electronic ordersets provided providers an easy way to implement new evidence-based care into their practice by providing an effective way to guide patient care through the ideas of using a checklist. Established review and maintenance processes ensured order sets were up to date and allowed for a multidisciplinary team approach for review and discussion. Electronic order sets were found to reduce variation in care between providers who cared for specific populations of patients but at the same time allowed for patient-centric care for the patient.

Project Methods

The author conducted a series of reviews related to unusual occurrences, safety catches, and errors associated with paper ordersets in the intensive care setting. Common themes identified were delay in care, transcription errors, and inconsistent use of evidence-based practice. Delays of care occurred when nursing staff was unaware paper orders had been completed and were waiting to be transcribed electronically. Furthermore, errors occurred during transcription when the wrong dialysate fluid would be placed electronically compared to the paper orders. Finally, multiple versions of the paper orderset could be found, including old versions that did not contain up-to-date information or orders. IRB approval was attained through SIUE but was not needed for the clinical site. Before implementation, staff completed a survey regarding paper order sets and their comfort levels using electronic powerplans. Staff was asked to rank their level of agreement on a 5 point Likert scale. A Post-implementation survey was sent out to assess staff the success of reducing errors related to the ordering process, the

effectiveness of education, and what could have been done differently. Resources used for implementing electronic ordersets in the ICU setting consisted of the surveys, just-in-time teach tools, Logicstream for data mining, and MIDAS for monitoring unusual occurrences and safety catches. Additional resources consisted of a project team and Information technology (IT) resources from Cerner to complete the electronic build. Risks to the project were updated evidence-based practices, staffing shortages, and temporary assignment holds due to resourcing from IT with increased workload due to COVID.

Evaluation

The ICU continuous renal therapy electronic power plan was implemented on April 15th, 2021. Since that implementation date, the program has treated 89 individual patients. Ultimately the project was ordered 272 times and takes into account adjustments were made to orders based on patient condition and treatment needs. Two nephrology providers were impacted during the implementation. Evaluation of ordering practices of providers shows that standardization of the ordering process did occur—variations in the ordering process related primarily to medications and dialysate fluid types. Upon data review, three unusual occurrences were logged related to CRRT errors. Those errors are associated with the incorrect orders being transposed from paper to electronic single order workflow. Patients were found to have correct dialysate back hanging per the electronic orders but the wrong fluids hanging per the paper order set. Post-implementation, no errors have been recorded.

Additional identified paper order sets to be reviewed and implemented electronically related to the Induced Hypothermia orders. This order set has not been reviewed since 2018. A small team was created for review, including an ICU nurse, a provider champion, and a pharmacist. Initial work started to review current evidence-based practice for this treatment;

however, due to a Covid surge, staffing shortage, and a system-wide halt on projects, this project was held for several months. Once project work is resumed, new evidence has shown that normal therming a patient before an open-heart procedure is best practice. This further information determined not to convert the current paper order set to electronic as the initiative would be discontinued.

The TPN order set was the final paper order set to be converted to paper. Multiple unusual occurrences have been written about delays in care and inconsistent care for patients. This is on paper and is often missed in the chart for several days. Although errors are still being reported due to a lack of resources, multiple Covid surges, and severe staffing storage, this has been put on hold indefinitely.

Staff completed a survey regarding paper order sets within the intensive care unit. Frontline staff were given statements and asked to rank their level of agreement on a 5 point Likert scale. The strong disagreement started at one and progressed to a five for strongly agreed. A survey has been completed both pre and post-implementation. The post-implementation assessed the comfort level and reduction in error related to eliminating the paper order sets. Open-ended questions will also include the thoughts of implementation and usefulness the new electronics provide. Two providers completed both the pre and post-surveys.

Twenty-five nurses also completed the pre and post-survey related to the implementation of the project. One hundred percent of staff felt that errors are seen among CRRT orders associated with the transcribing process from paper to electronic. One hundred percent of staff wanted to convert from paper to electronic power plans. Twenty-five percent of nurses were personally impacted by errors related to the transcription orders for CRRT. Responses varied on the need for education for using electronic power plans but trended on the side of needing

education. When asking staff if they submit unusual occurrences for errors related to CRRT, many responded that they were inconsistent with raising due to poor staffing, high acuity patients, and the length of time it took to complete. The post-implementation survey revealed that staff felt a reduction in errors related to CRRT and that patient safety had increased.

Impact on Practice

Multiple practice improvements were achieved by converting paper order sets to electronic. Standardization of the ordering process ensures that evidence-based practice is followed. Electronic ordering increases patient safety through clinical decision support and reduces errors during transcription. Staff surveys showed satisfaction with the implementation and education processes using step-by-step teaching tools for just-in-time education.

Plans include converting the paper order set for total parental nutrition when information technology resources a hat and projects are released from a hold status due to staffing crisis. Furthermore, education for new hires regarding the ordering and use of power plans should be created to ensure service standardization of the service system.

Conclusions

The health system can easily update and ensure evidence-based practices are being completed for patients with specific treatments and diagnoses through order sets. These can improve patient safety, reduce order time, and decrease order placement to implementation. Key stakeholders' in-depth evaluation from all impacted areas should be completed when implementing electronic power plans. Stakeholders who acted downstream, such as radiology, lab, etc., should be included in testing and education to prevent delays in implementation or re-

work. Education can be done via team teaching, but tools should ensure consistent education practices. Monitoring during go-live and after should be completed to troubleshoot issues in real-time. Often, additional needs are identified when staff is working through the new workflows.

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