Performance Improvement Using Early Warning Scores

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Early intervention with a declining patient can result in a better outcome for that patient. Quick interventions for serious medical issues can reduce the rate of transfers to the ICU and mortality. Rapid response teams (RRT) were created to do just that, get immediate care to the critically ill. This team relies on the nurse caring for that patient to notify them of changes in the patient's condition. Garretson, Rauzi, Meister, & Schuster (2006) say "that two thirds of cardiac arrests are potentially avoidable, and that when changes in the patient's clinical condition are identified early, cardiac arrest outcomes may improve" (p. 38). If the length of time between the patients decline and the rapid response team is too long, the outcome for that patient may not be good.

With the use of informatics, clinicians can be alerted to these declining patients through Early Warning Scores (EWS). Data collected in the electronic medical record (EMR) is combined to create a score of the patient's condition at that time. If the score represents a decline in their condition, an alert is created to warn the providers the patient needs to be assessed immediately. The EWS and RRT combined can create a higher level of quality care for the critically ill.

Rapid Response Teams

The use of a Rapid Response Team (RRT) is to get immediate care to the critically ill to prevent mortality. Rapid response teams, usually lead by a nurse (Leach & Mayo, 2013), are set up to be quick responses to patients that show signs of deterioration. According to Alshehri, Ljungberg, and Rüter (2015), RRT decreases the rate of mortality and transfers to the intensive care unit. They also found through a study, that cardiac arrest rates decreased from 7.6 per 1000

to 3 per 1000 after implementation of an RRT (Alshehri, Ljungberg, & Rüter, 2015). The

quicker the response team, the better the outcome may be for that patient.

  The nurse lead of the RRT will be alerted to the decline in the patient's health when the

nurse caring for that patient calls them. The communication from the unit nurse gives the first

impression of the patient's condition to the RRT nurse. Harris (2013) says that "communication

of deterioration is imperative to the management of deterioration on the general wards" (p. 432).

The RRT nurse has critical care experience so they can better assess if the patient is in need of

immediate care. Leach and Mayo (2013) say that the RRT nurse needs to be a skilled critical

care nurse because the goal of an RRT is to bring that expertise to patient's outside of the ICU.

This experience will ensure the patient is getting the proper care when critically ill.

Early Warning Scores

  Research has shown that patients show signs of deterioration before they go into cardiac

arrest. Mitchell, Schatz and Francis (2014) report that "up to 84% of patients show signs of

deterioration 6-8 hours preceding cardiac arrest" (p. 42). In order to see these signs, a scoring

method called an Early Warning Score (EWS) was created to alert nurses and physicians if their

patients are exhibiting signs of deterioration. According to McClelland (2015), the first early

warning score was published in 1997 and was "designed to escalate the care of the deteriorating

patient" (p. 81) and Groarke et al. (2008) state that "early warning scores are used to identify

physiological deterioration in patients" (p. 803). The deteriorating factors are documented over a

period of time which can sometimes be missed if not seen as a whole. The scoring system gives

the information together for the providers to see the decline pattern. An Early Warning Score

can be automated in the EMR to gather data on a patient in a given amount of time and create a

score on their level of stability. The alert can then be routed to the nurse caring for that patient.

The EWS was created to aid in the quick response of critical care to those in need, used in combination with rapid response teams, patient care can be greatly improved.

Process Improvement for Immediate Care of the Critically Ill

In a small community hospital of 200 beds, there is a Rapid Response Team (RRT) set up to assist in the care of deteriorating patients throughout the hospital. The team lead for the RRT is a critical care nurse who has a process in place to get other disciplines to help as needed. The RRT nurse gets a verbal report and reviews documentation in the electronic medical record. The response time of the RRT depends on when they receive the call from the nurse caring for the patient. Alshehri, Ljungberg, and Rüter (2015) say the average response time for an RRT member should be less than five minutes. After gathering data on response times for all RRT's, nursing leadership found that the response times were below average, an average of 10 minutes. This did not include the time from the first EWS. The time was calculated on what time the patient's nurses documenting seeing a change in status to when the RRT nurse was called then arrived. That means that the first signs of deterioration were detected sooner than the assessment by the nurse.   So total time from first signs to RRT response was greater than 10 minutes. This prompted the nursing team to propose a change in process to use the current Early Warning Score along with the RRT to improve response time and ultimately get immediate critical care to the patient.

The Early Warning Score (EWS) in place includes data collection of systolic blood pressure, heart rate, urine output, oxygen saturation, respiratory rate, and level of consciousness. The score is from 0-21, whereas each component carries a weight of 0-3. For example, systolic

blood pressure from 100-179 equals 0, 180-200 or 80-100 equals 1, 201-220 or 70-80 equals 2, and greater than 220 or less than 80 equals 3. The higher the score, the less stable the patient is and needs to be re-assessed by the nurse. The system automatically scores the patient when a new assessment with one of these components is saved. It then gathers the information for the last known value for all the other components and scores it. A score of 4 or greater is alerted to the nurse through the EMR. This prompts the nurse to re-assess and evaluate the condition of the patient. Depending on what the nurse thinks, an RRT may be called after her re-assessment. Nursing leadership wants to change this process to alert the nurse caring for the patient and the RRT nurse at the same time of the high EWS score.

Data Representation

A trial was done on one unit using the EWS to alert the nurse caring for the patient and the RRT nurse. A pager was set up to alert the RRT nurse for any patient in the hospital that scores a 4 or greater. The purpose of this was to get critical care to the patient before the need for an RRT. Nursing leadership wanted to show that a quicker response time would decrease the number of transfers to the intensive care unit.

To thoroughly collect the necessary information to compare before and after the RRT nurse alert for EWS scores, the following data points were used: time of EWS alert, EWS score, time of RRT call, length of time for RRT nurse response, and disposition of the patient after the RRT was finished. These data points show the total response time and the outcome of the situation. This will prove or disprove the theory that alerting the RRT nurse for a high EWS will improve response time and decrease the rate of inpatient transfers to the ICU.

The original process was a phone call to the RRT after the patients nurse had gotten a high EWS alert, re-assessed the patient, then decided an RRT was needed. The new process

sends an alert for a high EWS to the RRT nurse via a pager, as well as the patient's nurse. The RRT nurse opens the patient's medical record in the EMR and calls the floor. The patients nurse and RRT nurse discuss the patient's current condition and together decide on a plan of action. The main point in the process is the increase in collaboration and communication. Leach and Mayo (2013) say that effective teamwork and communication result in safe, high-quality care delivery. With both nurses being alerted at the same time, this gives them time to talk about the plan of care and still get critical care to the patient quickly. The response time of the RRT nurse from time of deterioration to face-to-face assessment improved with the new process.

Patient Outcomes

Using the EWS to alert the RRT nurse as well as the unit nurse proved to be an asset to the critically ill patient. Nurses were aware of deterioration sooner and were able to intervene. The average response time of the RRT is under 5 minutes. An even better outcome was the decrease in transfers to the ICU. The number of deaths following cardiac arrest did not decrease when compared in percentage but overall the number of inpatient cardiac arrests did decrease.

Leadership Approval

The trial outcomes were presented to hospital leadership in the form of reports and line graphs. It was shown that collaborating and communicating more, and decreasing the response time in minutes resulted in better patient outcomes. The decrease in response time of the RRT was obvious. The significant decrease in transfers to the ICU was also apparent. Hospital leadership saw this as an opportunity to save money which lead to the decision to make this process change throughout the hospital.

Conclusion

Prior to the use of computers, gathering data and analyzing it was a manual process. It was difficult to accomplish a sure set of findings. With the use of computers, gathering data is faster and more efficient. Healthcare policies and procedures sometimes need a change to improve the care of their patients. Without the use of informatics, those trends of processes that need improvement may not be found.

Using data analytics to show the response time of a critical care trained nurse to those in need of immediate care, proved that a change was needed. To make this known and give a reason for this change, data analytics was able to show the before and after response time and the outcomes of those situations. The process of getting immediate critical care to patients in need was improved with the help of data analytics. Ultimately, all healthcare organizations want their patients to receive the best care and quickly to avoid negative outcomes. Technology today can help with those improvements, especially with the use of data analytics.

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