Implementation of an Early Warning Scoring System to Identify Patients With Cancer at Risk for Deterioration

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Early warning scoring systems are tools for nurses to help monitor their patients and improve how quickly a patient experiencing a sudden decline receives clinical care. Nurse leaders and frontline staff at a major academic medical center implemented a new early warning system that gives clear guidelines to nurses, nursing assistants, and other clinicians about vital-sign parameters and changes in patients’ mental status.

At a Glance
• The early warning scoring system has been implemented on two inpatient units and in an outpatient infusion clinic.
• Nurses and patient care technicians carry color-coded cards that remind them who to notify and how frequently to reassess after a patient is found to have abnormal vital signs.
• Nurses and other staff members reported that they perceive improved interprofessional communication and greater confidence in their ability to recognize subtle signs that a patient may be at risk for rapid deterioration.

With clinicians striving to improve patient outcomes and reduce preventable adverse events, attention needs to be paid not only to caring for the patient in immediate distress, but also to predicting if a patient is in danger of deterioration and intervening in a timely manner. Clinical personnel are trained to recognize and initiate a code blue, but are they trained to identify aggregate warning signs that are far subtler than an absent pulse, yet nonetheless critical determinants of patient decompensation or even mortality? This column discusses the experience of the Johns Hopkins Hospital Sidney Kimmel Comprehensive Cancer Center (SKCCC) in creating and implementing an effective early warning scoring system with the goal of significantly improving the identification of and intervention with deteriorating patients and enhancing communication among nursing staff, patient care technicians, and providers.

Research shows that the inability of clinical personnel to recognize signs of patient deterioration (e.g., unusual change in vital signs, change in level of consciousness) and to document and communicate abnormal findings in a timely and actionable manner leads to potentially preventable morbidity and mortality (Stewart, Carman, Spegman, & Sabol, 2014). Patients can have physiologic changes as many as eight hours prior to an arrest event (Stewart et al., 2014), but these early warning signs are too often unrecognized or simply ignored. Although patient care technicians and other frontline personnel are well positioned to identify and intervene with deteriorating patients, such personnel are often not equipped with decision-support algorithms that could easily assist in the early identification of a patient showing warning signs of decompensation.

After the unexpected death of a patient in 2014, nursing staff members at SKCCC, a National Cancer Institute–designated comprehensive cancer center, asked themselves, “What would it look like if we had intervened sooner?” (Mooney, Olsen, & Shelton, 2014). SKCCC did not have a standardized tool to alert nursing leadership and providers about deteriorating patients. Nursing staff members determined that an early warning scoring system could improve detection and communication of deterioration, and facilitate escalation of care for these acutely ill patients. A pilot started in March 2014 on two designated units.

Literature Review

After reviewing the literature, the nursing leadership at SKCCC found examples of successful early warning scoring systems, such as the Modified Early Warning System (MEWS). First introduced by Morgan, Williams, and...
Wright (1997), MEWS uses physiologic measurements of patients' vital signs to detect patient deterioration (Stewart et al., 2014). MEWS and other similar early warning scoring tools have demonstrated a decreased incidence of cardiac arrest calls, admissions to the intensive care unit, and mortality (Stewart et al., 2014). Implementation of this type of tool has been found to increase the decision-making confidence of nurses and patient care technicians, driving reassessment of abnormal patient parameters and prompting more effective communication with appropriate clinical personnel of possible patient deterioration, resulting in an opportunity for effective and timely intervention (McDonnell et al., 2013).

Implementation

Using MEWS as a prototype, nurse leaders at SKCCC custom created their own early warning system. In determining the specific parameters of their tailored scorecard, the first step was performing an electronic health record (EHR) audit of 50 admissions to assess current practice related to documentation of abnormal assessments, frequency of reassessments, and communication to providers. Next, the nursing leadership surveyed the staff to inform the creation of an effective and usable algorithm. A preintervention survey was administered to unit RNs to identify beliefs regarding which assessment parameters are most important in determining a change in a patient condition and how these changes should be communicated.

The end result of this first phase of the initiative was the creation of color-coded, laminated badge cards that clearly show which signs are critical to assess (e.g., blood pressure, temperature) and what the danger zones are, and also how to react when a patient falls out of the "green zone" (Mooney et al., 2014). If a vital sign is severely abnormal—for example, if the respiratory rate is greater than 30—the card reminds the nurse or patient care technician to immediately notify the physician, charge nurse, and shift coordinator, and to reassess the patient every 15 minutes. If a vital sign is only moderately abnormal—for example, a systolic blood pressure of 165—the card instructs them to notify the physician and charge nurse and to reassess the patient in two hours. RNs and patient care technicians attended educational sessions on the use of the MEWS badge card. Nurses and patient care technicians use the same badge cards. Patient care technicians are instructed to report abnormal vital signs to the RN or covering RN immediately.

Although this early-phase solution is low-tech, it gives nurses and other clinical personnel not only a reminder that they need to watch for warning signs, but also an at-a-glance means of determining whether a patient is heading for trouble.

SKCCC has not yet published on the effectiveness of its modified scorecard system, but anecdotal reports suggest that the system is effectively promoting early recognition and intervention. Based on the scorecard’s success, leadership expanded implementation of MEWS to the outpatient oncology department. Many patients being seen for infusion therapy are high-acuity despite being ambulatory. These patients have vital signs taken and blood drawn before their appointments. Patient care technicians or other personnel involved with registering patients and doing pretreatment vitals have historically not been formally trained based on a scoring system, and opinions about what constitutes an abnormal varied. They take vitals, collect required demographic and financial data, and move on to the next patient. However, the literature shows that these frontline personnel—if given the right tools—are best poised to identify when something isn't right with their patients (James, Butler-Williams, Hunt, & Cox, 2010). In a second phase of the initiative, patient care technicians and phlebotomists in the outpatient oncology unit at SKCCC were trained on the use of MEWS and provided badge cards identical to the ones created for the inpatient units.

SKCCC is currently working to take the simple scorecard solution to the next step by integrating an early warning algorithm into its EHR, which will alert all relevant personnel to deteriorating patients rather than relying on the continuous evaluation and judgment of the patient care technicians. This innovation will flag decompensating patients to allow for immediate evaluation, thereby improving patient safety and operational flow in the oncology and phlebotomy departments. The use of a stepwise approach to implementing MEWS at SKCCC allowed them to learn from the inpatient experience prior to expanding to outpatient settings.

Conclusion

The use of an early warning scoring system is important in the prediction of clinical deterioration in patients and recommended by the Institute for Healthcare Improvement 5 Million Lives Campaign. Nursing leadership at SKCCC continues to refine and improve the first iteration of MEWS. Staff nurses have been resurveyed for their feedback on the use of MEWS and suggestions for refinements. The postintervention survey showed that nurses’ confidence in their ability to detect patient changes that could indicate deterioration increased to 100%. Staff properly identified respiratory rate as one of the most indicative parameters of patients’ clinical deterioration. The nurses noted that an opportunity to improve communication with providers and more frequent early interventions for deteriorating patients were valuable. Overall, the nurses reported personally seeing the positive results of MEWS and feeling ownership for the success.

The early results of MEWS at SKCCC may have potential profound implications for ambulatory infusion clinics with respect to planning and resource use. For example, say three patients who are scheduled for infusion appointments arrive at the clinic exhibiting criteria that would flag them in the danger zone based on MEWS. Without MEWS, these patients would likely occupy their scheduled infusion chair, where they may deteriorate and end up in the emergency department or admitted. The application of an early warning scoring tool has given SKCCC the ability to identify patients as high-risk upon presentation to the ambulatory area to triage the patient to the appropriate location. If the patient cannot be cared for in the clinic, staff can immediately triage the patient to the emergency department or to an inpatient oncology critical care bed for
admission. This improves operational flow for the infusion clinic and inpatient units. Additional plans include pre- and postimplementation analysis of arrest events, intensive care unit transfers, and mortality.

References


Do You Have an Interesting Topic to Share?

Safety provides readers with information on potential hazards affecting patients with cancer and those caring for them. Length should be no more than 1,000–1,500 words, exclusive of tables, figures, insets, and references. If interested, contact Associate Editor David G. Glenn, RN, MS, at david.glenn@umaryland.edu.