Implementing Change: Training for Adult Emergency Assessment, Recognition, and Stabilization for Novice and Non-Critical Care Nurses

Shannon C. Clancy-Burgess
*University of New Hampshire, Durham, shannonclancyburgess@gmail.com*

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Implementing Change: Training for Adult Emergency Assessment, Recognition, and Stabilization for Novice and Non-Critical Care Nurses

Shannon Clancy-Burgess, RN, BSN

University of New Hampshire

Faculty Mentor: Pamela S. Kallmerten, PhD, DNP, RN, CNL

Practice Mentor: Tara Drew, MSN, RN, CCRN

Date of Submission: May 23, 2024
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Abstract

**Background** At a macrosystem in New England hospital nurses are requesting more training for better preparedness in situations of clinical deterioration in the patient. Current education offerings were focused on cardiac and respiratory arrest situations. Review of the literature reveals the need for training in recognition and response to clinical deterioration. Simulation training can be a useful training tool.

**Methods** Several assessments were conducted to determine the need for a new course that focuses on recognition and response for stabilization. These assessments included an AHRQ Gap Analysis, a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, Stakeholder feedback using Qualtrics™, and an examination of Resource Allocation.

**Results** Analysis of the development of a new program for training that involves simulation revealed the implementation of this new course is possible. It will be cost saving for the facility in education hours in comparison to other educational offerings. The outcome on improved patient outcomes will be studied through the rest of 2024 and throughout 2025.

**Discussion** The implementation of this course is feasible due to the reduction of resources compared to other course offerings. Attendees of this course will be able to maintain a full clinical point of care work week, with minimal overtime. Outcomes on the confidence of the nurses prior to the course and post-course will be tracked with evaluations of the subjective experience. Patient outcomes will need to be trended prior to the implementation and post course to validate its effectiveness.

**Keywords:** Patient deterioration, new nurse, training, recognition, emergency preparedness, rapid response team.

**Introduction**
**Problem Description**

New Hampshire hospitals are experiencing a loss of experienced bedside nurses. During the pandemic, New Hampshire lost 500 nurses from 2020-2022 (Nursing Shortages in 2024, 2024). While the labor force of healthcare and social assistance personnel in New Hampshire remained 325 positions lower than average, the population in the state increased by 1.3% during most of 2023 (Health in New Hampshire, n.d.).

The population in New Hampshire is more acutely ill compared to previous decades (Timmins, 2022). Educational opportunities for clinical situations have been lacking due to the recent pandemic (American Hospital Association, 2023). An increase in patient acuity and a decrease in experience at the bedside creates safety concerns for patient care. Patient outcomes can be improved when bedside nurses can recognize a clinical change in the patient and act quickly to gain stabilization before the patient deteriorates into full cardiac or respiratory arrest (Fernando et al., 2018).

In response to the decrease in the experience levels of the inpatient bedside nurse and the increase in acuity in the patient population, staff at a local New Hampshire hospital are eager for training to gain a better response to deteriorating clinical situations. Patient outcomes can be improved when bedside nurses can recognize a clinical change and act quickly to gain stabilization before the patient deteriorates into full cardiac or respiratory arrest (Fernando et al., 2018). The goal of increased training is to recognize clinical deterioration, implement interventions, and prevent cardiac and respiratory arrest. A current educational offering at this hospital includes American Heart Association’s Advanced Cardiac Life Support© (ACLS) course, which is offered approximately twice per month in the Update format, and every other month in the Initial format (Advanced Cardiovascular Life Support, n.d.). The Update course is
approximately a ten-hour education day. The Initial course is approximately two ten-hours days. Additionally, in recent months, quarterly Code Blue Team Training has been reinstated after being canceled during and since the pandemic. Three sessions have been offered during the first quarter of 2024, with a 12-seat maximum occupancy. Staff and educators are requesting more Code Blue Team Training as well as more ACLS classes. In both educational offerings the scenarios have a focus of a patient in full cardiac or respiratory arrest and do not focus on the pre-arrest clinical deterioration.

At this local hospital, leadership and educational teams are requesting more novice staff attend the ACLS-Initial course. Some of these requests are coming from areas of the hospital that do not require ACLS training in their job description. The content of the ACLS program poses a challenge for the lesser experienced nurse, as well as the resources available to support the successful completion of the course. In 2024, two staff members have been unable to complete an ACLS-Update course. Both staff members had previously completed an ACLS Initial course at a different facility. One staff member did not have this as a job requirement. She was encouraged to take the two-day ACLS-Initial class to assist with her learning deficits. She was also unable to complete all components of the ACLS-Initial class. An additional staff member, for which course completion is required, participated and was unable to complete the requirements. An individualized education plan has been made for her to enroll in a Basic Dysrhythmia class, and then take the two-day ACLS-Initial class. Both individuals utilized resources of a 10-hour education day attempting to complete the ACLS-Update course, and then have or will utilize a two-day 20-hour ACLS-Initial course. The challenge here is allocating the resources to provide the educational content that facilitates competency and progression. When
resources are used for staff that do not require any specific training, it decreases the resource pool.

At this local hospital, the areas that require nurses to maintain ACLS course completion every two years are the following: the Emergency Department, the Intensive Care Unit, the Progressive Care Unit, the Post-Anesthesia Care Unit, and procedural sedation departments, like the Endoscopy Center. Areas that encourage nurses to take the ACLS course are the Telemetry Care Unit and Operating Room. Lastly, nurses that work primarily in the Clinical Decision Unit, the Observation Unit, and Obstetric units are supported in the decision to complete the ACLS course.

A steady increase in attendance rate of the ACLS-Initial as well as the Update courses were noted during the pre-pandemic years to 2023. Enrollment numbers for 2020-2022 are not an accurate reflection of increased demand due to the impact of the pandemic. Both participant and instructor availability were impacted. Enrollment was also impacted by the Center for Disease Control guidelines to avoid unnecessary close contact. In 2024, we begin to see a sharp uptake in enrollment. To date there have 48 participants complete the ACLS-Update course with a projection of 258 participants through the remainder of 2024. This is an increase of 25 percent from the previous year. To date there have been 6 participants complete the ACLS-Initial course with a projection of 66 participants through the remainder of 2024. This is an increase of 9% from the previous years. Some of those classes have taken place in the first quarter of the year (Table 1). There has not been any change to the par level of available ACLS course instructors with this increase in demand (Table 2.).
Table 1.

**Attendees of ACLS Participant Trending, pre-pandemic to current**

<table>
<thead>
<tr>
<th>Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACLS Update</td>
<td>182</td>
<td>202*</td>
<td>186*</td>
<td>173**</td>
<td>195</td>
<td>59/258 as of May 16th</td>
</tr>
<tr>
<td>ACLS Initial</td>
<td>51</td>
<td>31*</td>
<td>39*</td>
<td>45**</td>
<td>60</td>
<td>10/66 as of May 16th</td>
</tr>
</tbody>
</table>

*Multiple scheduled classes were canceled due to the pandemic. ACLS-U capped at 12 seat capacity, without exception.

**February ACLS-U class with 12-seat enrollment capacity canceled to send staff back to bedside due to acute medical surge. January ACLS-U capped at 6 seat capacity due to surge, and lack of instructors. No classes were held in February.

Table 2.

**ACLS Course Instructor Availability Trending, Pre-pandemic to Current**

<table>
<thead>
<tr>
<th>Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Instructors</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Available Knowledge

A research question guided the review of the literature regarding the best practices for the education of nurses in recognizing and responding to clinical deterioration. The question is: does additional training and education in recognition and responding to clinical deterioration improve patient outcomes? Through the Boolean method of search, the key words “nurse” and “early recognition” were in the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) format (Figure 1). The years 2014-2024 were included, along with filters for “adult” and “systematic review.” A total of 22 sources were discovered from PubMed, 5 sources from
the Cumulative Index of Nursing and Allied Health Literature, and 5 sources from Medline. Two duplicate records were removed. A total of 30 records were screened by title and abstract. Twenty-five records were excluded for the following reasons: 18 for diagnosis specific, 2 for screening tool related, 1 for academic setting, 1 for family focus, and 2 for being an unrelated topic. The three remaining records were determined to be high level systematic reviews and were therefore included. In addition, an integrative review was included related to resources reviewed. All evidence reviewed was applicable to adult patient units without specialty populations. Literature addressing Emergency Departments and Intensive Care Units was excluded and not applicable to this area of focus. In total, the literature review included three systematic reviews and one integrative review.

**Figure 1.**

*Prisma Flowsheet*

<table>
<thead>
<tr>
<th>Identification of studies via databases and registers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Records identified from:</strong> Databases (n = 31)</td>
</tr>
<tr>
<td><strong>Records removed before screening:</strong></td>
</tr>
<tr>
<td>Duplicate records removed (n = 2)</td>
</tr>
<tr>
<td>Records removed for other reasons (n = 0)</td>
</tr>
<tr>
<td><strong>Additional records identified through other sources, screening reference lists (n = 1)</strong></td>
</tr>
<tr>
<td><strong>Records screened (n = 30)</strong></td>
</tr>
<tr>
<td><strong>Reports sought for retrieval (n = 4)</strong></td>
</tr>
<tr>
<td><strong>Reports excluded</strong> (n = 26)</td>
</tr>
<tr>
<td><strong>Reports not retrieved (n = 0)</strong></td>
</tr>
<tr>
<td><strong>Reports excluded:</strong></td>
</tr>
<tr>
<td>Diagnosis specific (n = 18)</td>
</tr>
<tr>
<td>Screening tool (n = 2)</td>
</tr>
<tr>
<td>Vital sign triggered (n = 1)</td>
</tr>
<tr>
<td>Academic setting (n = 1)</td>
</tr>
<tr>
<td>Family focus (n = 2)</td>
</tr>
<tr>
<td>Unrelated to topic (n = 2)</td>
</tr>
<tr>
<td><strong>Studies included in review (n = 4)</strong></td>
</tr>
</tbody>
</table>

Review of Evidence

In the systemic review from Douw, et al (2015) the idea of nurses’ intuition was explored. The foundation of the review is that nurses often recognize clinical change before changes can be clearly defined through measurable evidence, for example, with vital signs changes. The goal of this review was to identify themes in the signs and symptoms that cause nurses to feel worried or concerned for their patients. To highlight the history of “nurse intuition” these authors refer to experts like Benner et al (2009) defining this intuition as, “a judgement without a rationale, a direct apprehension and response without resource to calculate rationally” (p. 2).

The focus of this systematic review is to validate this feeling of worry and associate it to early signs of deterioration that may not be part of existing rapid response team (RRT) activation criteria. Ten general categories of indicators of deterioration were discovered. These indicators include a change in breathing, a change in circulation, temperature, impaired mentation, agitation, pain, no progress, patient reports of feeling unwell, subjective observations by the nurse, and knowing there is a concern without rationale (Douw et al., 2015). Each category was broken down into further specifics that included thirty-seven signs and symptoms. While each of these categories can be broken down into more specific signs and symptoms, subtle changes in one or more category that may not be considered sufficient to activate a RRT can be early warning signs of a worsening condition that is evolving (Douw et al., 2015).

This systematic review used the Strengthening and Reporting of Observational Studies in Epidemiology (STROBE) instrument to assess the quality of the quantitative data. Qualitative studies were evaluated using the National Institute for Health and Clinical Excellence Methodology checklist. A total of eighteen studies were included. Low methodology studies
were excluded. The authors identified a few areas of limitations. These areas include results from observational and qualitative studies, the heterogeneity of the studies, and the lack of focus on the nurse’s worry and concern as the specific area of their focus (Douw et al., 2015). This systematic review is a high level of research based on the Joanna Briggs Institute (JBI) hierarchy (Joanna Briggs Institute., 2011).

Connell et al., (2016) looks at the validity of simulation with medium to high fidelity training scenarios to impact the recognition and management of clinical deterioration. In support of training these authors highlight the evidence of the changes that occur in most patients during the 8 hours prior to critical events. The goal of this systematic review is to separate the well-established evidence of better outcomes after the implementation of RRTs from the education toward identifying the recognition of clinical deterioration (Connell et al., 2016).

Through the systematic review evidence found determined that education done through simulation with low fidelity can improve staff knowledge and skill. There is an increased benefit to medium and high-fidelity simulation and in situ scenarios. These conclusions were based on staff self-reporting increased confidence, increase in utilization of RRT activation, and through measurable patient outcomes (Connell et al., 2016).

In this systematic review by Connell et al., (2016) twenty quantitative, two mixed methods, and one qualitative studies were included in the review. This systematic review used several tools to evaluate results. These tools include the Evaluation Tool for Quantitative Research Studies and the Evaluation Tool for ‘Mixed Methods’ Study Design. Additionally, the Critical Appraisal Skills Program was used to evaluate the qualitative results. The authors recognize the limitations due to the level III evidence from the quasi-experimental study. Additionally, the randomized control trial does not include any adaptation for education that may
be needed for a learner. They also note due to overwhelmingly positive subjective feedback there may be response bias (Connell et al., 2016). This systematic review is a high level of research based on the Joanna Briggs Institute (JBI) hierarchy (Joanna Briggs Institute., 2011).

A 2017 integrative review (Massey et al., 2017), looked at the importance of recognition and responding to clinical deterioration. This recognition and response determines patient outcomes, with both short- and long-term consequences. In this review recognizing patient deterioration and responding to patient deterioration were broken down into further sub-categories (Massey et al., 2017).

The authors of this integrative review sub-divide “recognition of clinical deterioration” into four themes: assessing the patient, knowing the patient, education, and equipment (Massey et al., 2017). Assessing patients, making observations, and checking vital signs were key to identifying concerns of a clinical change. Nurses often use vital sign changes to “package” or solidify a clinical picture when contacting a provider with an expectation of an escalation of care. Being familiar with a patient was linked with an increased likeliness in recognizing subtle clinical changes. The educational background of the nurse plays an important factor in early recognition with 4-year degree responding faster than those with a 2-year degree. Postgraduates were noted to have more confidence in their response. Finally, equipment is noted to play a factor in recognition. Utilizing equipment for frequency of assessments, trending and alerts can improve the recognition time (Massey et al., 2017).

“Responding to patient deterioration” was sub-divided by the authors into three themes: non-technical skills, accessing support, and negative emotional responses (Massey et al., 2017). Non-technical skills include the support provided to the nurse. This support includes how effective leadership, teamwork, communication, and situational awareness can impact a nurse’s
response to patient deterioration. Access to support is important for successful response. Having the availability of a more senior nurse, or providers is crucial. When negative emotions are associated with responding, the nurse can be delayed in the response. If there is fear or anxiety there may be a delay. If there is concern for negative consequences for the nurse, this can also impede the response to patients (Massey et al., 2017).

In Massey et al. (2017)’s integrative review, qualitative and quantitative studies were included along with mixed methodologies. The quality of studies included were moderate to high. The tool used by the authors was Mixed Methods Assessment Tool. JBI hierarchy does not provide guidance for rating in the integrative review (Santos et al., 2018).

The most comprehensive systematic review that resulted from the search is by Treacy and Stayt in 2019. In this review they examine the influencing factors identifying the barriers to recognizing and responding to clinical deterioration. These factors are clearly defined into categories and include the following: knowledge and understanding of clinical deterioration, organizational factors in both managing deterioration as well as staffing levels, and communication through inter-professional relationships as well as through professional to patient (Treacy & Stayt, 2019).

An interesting discovery in the category of “knowledge and understanding of clinical deterioration” is the reliance of vital sign trending as a guide toward recognizing deterioration. While this is often a key trigger for inpatient nurses to activate RRTs, the frequency that vital signs are trended is not always as often as it should be clinically indicated. This section also highlights the lack of basic assessment skills in nurses along with the preference of providers to have these findings reported when calling with concerns. The largest issue with lack of knowledge and understanding of clinical deterioration reported is the level of clinical
deterioration before recognition occurred. The delay often was the cause of a poor outcome (Treacy & Stayt, 2019).

Organizational challenges fall into two categories. The first is from a perspective of early warning screening tools or Early Warning Scores (EWS). While there is supportive evidence that these screenings can benefit outcomes for patients, it is often not the case. From the nursing perspective, the screening can be incomplete, or the nurse can feel the process is complete when an abnormal score is reported. Providers may not know what to do when the EWS alerts or feel as though they need to initiate some intervention though none would be clinically indicated. Additionally, vital sign frequency may not be ordered appropriately. This can lead to nurses following orders rather than using clinical judgement causing delay in recognition of changes (Treacy & Stayt, 2019).

The second organizational factor is related to staffing. Reports of not having enough time to check vital signs or lab results lead to a lack of recognition of early signs of clinical changes. This can particularly be true for night shift staffing. Further concern should occur for units that require contracted employees. These temporary employees are less familiar with facility escalation processes when they have concerns about a patient. All these factors can lead to delay in recognition and response, which further delays intervention (Treacy & Stayt, 2019).

The last category of contributing factors in recognizing and responding to deterioration to come of this systematic review is communication. Communication impacts occur from two factors. Communication between nurses and providers can impact the process of recognition and response. This review found that nurses can be both unaware of workloads of providers and over report concerns, contrarily nurse could also be aware of workloads and avoid notifications. The topic of the nurse reporting a EWS and “being done” with the patient situation again comes up in
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this area. Communication between nurse and provider can end with the notification and fail to advocate for timely interventions. Providers also report challenges in having EWS reported without any assessment or supportive findings (Treacy & Stayt, 2019).

Communication can also be an issue between patients and health care professionals. Language barriers, cognitive impairment, and cultural or religious beliefs can challenge early recognition of changes in the clinical picture. For these reasons, a patient may be unable to communicate concerns or symptoms to their health care team. This can cause delay in recognition (Treacy & Stayt, 2019).

Treacy & Stayt (2019), conducted a systematic review with both qualitative and quantitative studies. However, these authors did not eliminate any studies based on quality level. They determined inclusion of all the studies was justified. The result of this justification is a range in quality in studies from weak to moderate. The Critical Appraisal Skills Programme was used to evaluate the qualitative studies as well as portions of the mixed method data. For the quantitative studies, the Effective Public Health Practice Project tool was used. This systematic review is rated a high level based on JBI hierarchy (Joanna Briggs Institute., 2011).

Evidence Synthesis

Based on the reviewed evidence, it can be concluded that bedside inpatient nursing staff are less experienced, and education has been sub-optimal. An additional area of concern is that patient acuity is increasing. Also, challenges have risen from the impact of the pandemic on learning opportunities and staffing.

Several themes were noted in this literature review including barriers to recognition and response, vital sign monitoring and workforce impacts (Connell et al., 2016; Douw et al., 2015; Massey et al., 2017; Treacy & Stayt, 2019). Nurses can delay reporting patient deterioration out
of fear or anxiousness (Massey et al. 2017). Failure to give or understand a proper report by Situation, Background, Assessment, and Recommendation (SBAR) to illicit the providers attention when reporting is a barrier to responding to patient deterioration (Treacy & Stayt, 2019).

Vital sign monitoring was another theme with some seeing it as routine task and others realizing the importance of more frequent assessment for early recognition. Treacy & Stayt (2019) reported out how respiratory rate is often estimated and not counted. This vital sign can frequently be utilized to recognize warnings of deterioration. Douw et al. (2015) addressed the reporting of nurses’ intuition of deterioration can delayed if there is lack of validation in vital signs. In other words, if the nurse was concerned about a non-measurable issue, reporting was delayed if vital signs were stable or unchanged. Connell et al. (2016) reported a measurable increase in vital sign frequency after education training around early recognition and response. Frequency of physical assessments and vital signs can escalate or deter the timeframe of recognition and response of patient deterioration (Massey et al., 2017). Massey et al. (2017) goes on to express concerns on a growing belief from nurses that vital signs are a task to be done, rather than an essential component of a more complete clinical picture of the patient. Treacy & Stayt (2019) illuminate the clinical decision making when the provider order does not match what is required in clinical deterioration. For example, if a patient has vital signs ordered every four-hours, but is showing a concerning trend, the trend will be recognized later without clinical judgement to increase the frequency.

Workforce, defined as nurse-patient ratios, is another common theme. This ratio can contribute to a delay or failure of timely recognition and response to patient deterioration (Connell et al., 2016; Massey et al. 2017). Massey et al. (2017) further reports that the nurse
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Patient ratio can impact the ability to know the patient at a level to provide the ability to recognize subtle changes. Larger ratios make it harder to achieve and maintain that level of assessment frequency when the nurse’s time is further divided.

Due to cost and resource allocation, it is important to validate the effectiveness of simulation training with measurable outcomes. Simulation training can mean a variety of things. It is often accompanied by a didactic, but not always. The length of the simulation session can impact outcomes as noted by Connell et al. (2016). Connell et al. (2016) summarizes the improvements in confidence of staff, communication within an interdisciplinary team, and in the time to recognize patient deterioration. The average duration of a simulation training is eight-hours, with a demonstrated effectiveness time for learning at just 40 minutes. This discrepancy in average time versus effective time does not consider the didactic portion of training, however. Massey et al. (2017) reports the benefits of simulation for nursing students but did not find supportive evidence for inpatient nurses included in the focus of their review.

Douw et al. (2015) highlights many of the issues in the themes of this review by summarizing assessment finding that could be reviewed in a didactic environment and then practiced in a simulated training exercise. Symptoms like chest pain, respiratory distress, or altered mental status could trigger a nurse’s intuitive skills to activate a RRT, or at minimum notify the provider. Many times, these clinical changes or symptoms will precede vital sign changes. Responding to these situations can prevent further deterioration.

Of the four articles included, three were systematic reviews. Systematic reviews are considered a high level of research based on JBI hierarchy. The integrative review was robust, however, as this is a literature review rather than a systematic review, it not reflected on the JBI hierarchy. Overall, this research is high level and supports evidence-based practice.
Rationale

Through the process of this gap analysis, it was determined there was a need to bridge changes in care for patients to current workforce and educational deficits in a post-pandemic state. Data was collected to validate the increase in educational requests and determine the educational content did not meet the needs of patients or staff. A sustainable, more cost-effective course was developed that included content directed specifically toward the point of care nurse in non-critical care areas as well as novice nurses in a variety of patient care units. Effectiveness of this new course will be monitored through enrollment of this course, as well as other offerings, it will be measured through data trending of RRT and Code Blue incidents per month, and it will have a subjective report from participants on the confidence level in managing clinical deterioration for both pre-course and post-course self-assessments.

Content for this program was modeled after the American Heart Association’s (AHA) Pediatric Emergency, Assessment, Recognition, and Stabilization (PEARS) program that trains emergency nurses in the care of their pediatric patients. This program is a well-established program that teaches a systematic approach to clinical deterioration or changes observed in a patient. AHA does not offer this course for adults.

Implementation of this new course aligns with the strategic educational plan by the hospital. This is based on observations by educators and preceptors who onboard new staff. This is also based on trending of RRTs and Code blue incidence and the objective to improve patient outcomes. This is in response to an increase request in education from point of care staff. Education directed at the point of care nurse, without critical care experience, or novice nurses is
intended to contribute to improvement in quality in several areas. Most importantly, the area of improvement that would be a top priority is the care of the patient. Secondly, the goal would be to improve staff confidence and morale. Additionally, if this increase in staff response resulted in higher retention, that would be a considerable gain for the patients and hospital. Framework for this gap analysis is taken from Davis-Ajami et al. (2014).

**Specific Aims**

The goal of this new program would be to improve recognition of clinical change. The course teaches the participants the importance of the “across the room glance.” From that quick visual assessment, does the nurse proceed with intended plan, or does the plan change to a systematic approach to assessing emergencies? The focus is also on assessing if the nurse comfortable alone with the patient and how soon do you call for help. Data will need to be collected and evaluated for trends prior up to and following the implementation of this course. It is the goal of this educational intervention, that RRT activation will increase, SBARs to providers will improve, and early interventions will be implemented. These improvements should result in a decrease in Code Blues, as well as less transfers for an escalated level of care.

Current state offers a variety of training for adult and pediatric cardiac and respiratory arrest but lacks any offering to address how to assess and respond to a clinical change and deterioration of a patient condition. Nurses are requesting education to support their knowledge and skill in being more prepared to appropriately respond to these situations. Post pandemic, the staff have a lower average of years of nursing experience, are working with higher patient ratios,
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and the community has an increasing acuity. To optimize the care and outcome of the patients, education needs to be provided.

To measure the impact of the educational content of this course, RRT and Code Blue will be trended by month. The goal will be to increase RRT activation and decrease the occurrence of Code Blue situations. Participants will be surveyed at the conclusion of each course to obtain their subjective confidence and feelings of preparedness in clinical deterioration situations prior to attending class and after the completion.

**Methods**

**Context**

The topic for this Gap Analysis was selected based on educational requests from point of care nurses, educators, and members of the leadership team. Based on observations made by educators, current educational offerings were not meeting the needs of the request. This conclusion is based on observations of staff struggling through the content of current courses, without any subjective increase in confidence in responding to emergent patient situations. The current focus of educational content is focused on cardiac and respiratory arrest response, and lacks response to clinical deterioration to prevent arrest and promote stabilization of patients. Current offerings were taking large amounts of educational hours, with inappropriate content for inpatient adult point of care nurses.

**Resource Allocation**

This local hospital has ample opportunities for training in response to cardiac and respiratory arrest. Hospital educators utilize American Heart Association (AHA) programs for
Basic Life Support as well as Advanced Cardiac Life Support courses. In the pediatric population, the educators also offer, through AHA, the course Pediatric Emergency, Assessment, Recognition, and Stabilization (PEARS) in addition to the Pediatric Advanced Life Support (PALS) course. There are also a variety of other offerings, like Code Blue Team training for both adult and pediatric staff. A gap was noted in the provision of staff training to assist in learning about early recognition and intervention for clinical deterioration in the adult patients. This gap in educational content seems to be most applicable to non-critical care areas.

To address the gap and improve recognition and response time to deterioration of the adult patient, a course was developed to model the PEARS educational format. This course is called Concord Hospital Emergency, Assessment, Recognition, and Stabilization (CHEARS). Nurses at the point of care are trained in head-to-toe or focused assessment as part of their pre-licensure nursing education. This course provides an alternative systematic approach to assess quickly and consistently, then intervene, with the goal of preventing further deterioration. The resources needed for implementation include those for human, physical, printed material, and other requirements.

**Human Resources**

An instructor is needed for the morning didactic portion, for up to eighteen participants. One instructor is required for each simulation, ideally, with simulation groups being between six and seven participants. The small group facilitator would provide a technology review, as well as the simulation scenarios for each nurse. Scenarios would run to provide a simulation for each primary nurse an opportunity to practice systematic recognition and assessment.
Physical Resources

A large classroom with the occupancy of a maximum of eighteen participants is required for the didactic portion of this course. This same room would be utilized at the end of class for a question-and-answer period, as well as for completing evaluations. A manikin or a Standardized Patient is needed for each simulation group. Additionally, supplies for airway support are needed in each simulation room. This would include but not limited to, a bag-valve-mask, an oral pharyngeal airway, a nasal pharyngeal airway, a non-rebreather, a nasal canula.

In each scenario, participants would need access to a Zoll™ defibrillator, with safe cords, electrodes, and defibrillation pads. The instructor would need a rhythm generator as well as the live cords to safely control any energy delivered during simulation scenarios. A simulation phone should be available in each setting for communication during the simulation.

There is no concern for physical space, availability of manikins or other items to increase fidelity. These items, including monitors for generating vital signs, already exist in the Simulation and Education Center. No additional purchases would need to be made.

Printed Reference Material

Each scenario will have reusable laminated printed reference material. This will include the across the room glance assessment triangle, a reference for Signs and Symptoms, Allergies, Medications, Past medical history, Last meal, and Events (SAMPLE), Rapid Response order set for the macrosystem with dry erase maker and eraser. In addition, specific protocols for the
macrosystem for sepsis, naloxone, and anaphylaxis will be printed and laminated for each scenario.

In the didactic setting the participants will be provided with resources to refer to during the course. These reference sheets are printed material for each participant to annotate during class and keep as a reference for the future. Included in these materials is the Systematic review, Management of Cardiac, Management of Shock and Management of Respiratory Emergencies.

Name tags will be provided, not as the individuals name, but for the purpose of identification of the role they play as the participants rotate through each scenario. The instructor will need a schedule to rotate the participants to ensure each has an opportunity to participate in all the roles. The participants will need a white board with dry erase maker as well as eraser to record a visual record of events in each scenario to add in debriefing. The printing of course material is never a budgetary concern. If printed material became significant, there is an internal copy center for large orders.

**Intervention**

The AHRQ Gap Analysis tool was used to compare current state to best practice and facilitate decisions about the implantation. Support for the identification of strategies to improve early recognition and response to clinical deterioration was noted. A second strategy included the use of simulation-based training to meet the educational needs of adult inpatient point of care nurses (Table 3).
## AHRQ Gap Analysis Tool

<table>
<thead>
<tr>
<th>Best Practice Strategies</th>
<th>How Current Practices Differ From Best Practice</th>
<th>Barriers to Best Practice Implementation</th>
<th>Will Implement Best Practice (Yes/No; why not?)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best Practice #1:</strong> Identify strategies to improve early recognition and response to clinical deterioration</td>
<td>Current educational offering includes Code Blue Team Training and ACLS. No current offerings for recognition and response to clinical deterioration in the adult population.</td>
<td>Under staffing limits availability for staff to attend training, often only while accruing over-time. Lack of existing course content in established program with AHA. Limited availability of educators with open positions unfilled.</td>
<td>Yes. The organization has made the decision to allocate the resources to build and implement a new program.</td>
</tr>
<tr>
<td>Provide additional education and training to staff (American Hospital Association, 2023; Connell et al., 2016; Massey et al., 2017)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Best Practice #2:</strong> Include simulation as part of the education program</td>
<td>Use of simulation in training is regularly used in other programs.</td>
<td>The willingness of leadership to allocate the expense of a six-hour education day, which will require some overtime expenses.</td>
<td>Yes: classes have been built once per month through the end of 2024. There is availability to increase class size as the program builds.</td>
</tr>
<tr>
<td>Provide simulation training (Connell et al., 2016; Massey et al., 2017)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The SWOT analysis further assisted in identifying facilitators and barriers for the implementation of a new program. Identified strengths includes evidence-based literature validating the need for education. It also includes the framework for the existing AHA program for pediatric patients. Weaknesses identified include the financial cost of a six-hour education
day, the availability of staff in an ongoing staffing shortage, the availability of educators, in both developing and facilitating the course.

The opportunities that were identified included the potential of earlier recognition for intervention, improving overall patient outcomes and a decrease in Code Blues. Additionally, there is opportunity to revise the policy in the form of ACLS course requirements. The opportunity of implementation is increased by the existence of a simulation space with all necessary supplies available for this educational content. Threats to the implementation of this program include reluctance from staff to participate due to additional work time, as well as the reluctance of policy makers, both at the hospital and regulatory level. Additional threats are derived from staffing shortages, particularly with last minute staffing needs, that would cause participants to be withdrawn from this course for point of care needs. Space availability in the form a calendar that is built the year prior also poses a threat to implementation (Table 4).
### Table 4.

**SWOT Analysis**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Origins: People, Resources, Innovation, Marketing/Communication and Finance</strong></td>
<td><strong>Cost of six-hour education day for educators as well as participants</strong></td>
</tr>
<tr>
<td>▪ Existing evidence in support of the need for this new program</td>
<td>▪ Availability of staff for additional workday</td>
</tr>
<tr>
<td>▪ Framework for the Intervention is well-researched by the AHA for their comparable PEARs course</td>
<td>▪ Availability of educators with several open positions</td>
</tr>
<tr>
<td></td>
<td>▪ Time to build a new course, with time to make improvements with feedback from participants</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Origins: Environmental Attributes, Economic and Social Trends, Policy/Regulation</strong></td>
<td><strong>Reluctance of staff to add additional time at work</strong></td>
</tr>
<tr>
<td>▪ To have improved patient outcomes with early recognition and response to deteriorating clinical situations</td>
<td>▪ Policy makers, both at the hospital level in Human Resources and Nursing, as well as regulatory bodies, unwilling to change views on ACLS course requirement and encouragement</td>
</tr>
<tr>
<td>▪ To decrease Code Blues</td>
<td>▪ Last minute staffing changes forcing withdrawals from class</td>
</tr>
<tr>
<td>▪ Potential to change policy of ACLS requirement with this new program</td>
<td>▪ Space availability in the Simulation and Education Center that builds the calendar the year prior</td>
</tr>
<tr>
<td>▪ Existing Simulation and Education Center that allows for fidelity trained staff, space, and educators to facilitate course</td>
<td></td>
</tr>
</tbody>
</table>
Stakeholder Feedback

A big stakeholder in the recognition and response to clinical deterioration is the patient. Outcomes after a critical illness include weakness impacting loss of mobility and independence, mood disorders, including depression, and long-term multi-organ failure (Herridge et al., 2023). The patient’s family, who may be in a position to deal with the sequela of a deterioration situation, is also a key stakeholder. The need for care at home, or loss of independence can transition responsibility to the family. There are also impacts on mental health on the patient’s family, with an increased incidence of anxiety, depression, grief, and post-traumatic stress disorder (Herridge et al., 2023).

The nurse is also a key stakeholder. Moral distress can occur with a poor patient outcome. Blame can be placed on the nurse. In addition to the feelings of moral distress, this blame can affect staff retention, morale, and turnover. Some of the guilt felt by nurses may be the blame placed internally. It can also come from external sources like the patient’s family, the provider, or from members of leadership (Davidson et al., 2018). There is also a financial consequence for failure to recognize clinical deterioration. The hospital is included in the list of stakeholders. Lawsuits with significant monetary settlements have been awarded for lack of recognition (Oyeleye, 2019).

With these stakeholders in mind, and with the increase in acuity, decrease in nursing experience and increase in patient ratios, it is important to look at trending prior to the pandemic through current data. It is concerning that the trending of RRTs and Code Blues at this local hospital are increasing. For the current calendar year, there have been more RRTs and Code Blues per month as previous years show ranges from 20-25 per months for RRTs and 4-6 Code
Blues activations per month. For the current calendar year, we are noting approximately 36 RRTs per month which translates to an increased demand on our current resources (Table 5).

Table 5.

*Frequency of Rapid Response Team (RRT) and Code Blue Activation*

<table>
<thead>
<tr>
<th>Year</th>
<th>RRT frequency</th>
<th>Code Blue frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>246</td>
<td>57</td>
</tr>
<tr>
<td>2020</td>
<td>255</td>
<td>61</td>
</tr>
<tr>
<td>2021</td>
<td>263</td>
<td>72</td>
</tr>
<tr>
<td>2022</td>
<td>295</td>
<td>71</td>
</tr>
<tr>
<td>2023</td>
<td>307</td>
<td>70</td>
</tr>
<tr>
<td>2024</td>
<td>198 (as of 5/16/2024)</td>
<td>41 (as of 5/16/2024)</td>
</tr>
</tbody>
</table>

*These numbers do not include Code Blues in the Emergency Department or Intensive Care Unit, as those areas are not the target areas of this course.

Based on conversations with educators and those in leadership positions, feedback from the Nurse Residency Program participants, staff at the point of care, and event reporting, there has been an increase in request for education. Due to lack of other options, Code Blue Team Training and the ACLS courses are in high demand. The ACLS course is not required for all nurses at this hospital. With the increase in RRT activation, justification can be made for equal parts stakeholder ownership between the patients for better outcomes and for staff for better preparedness for recognition and response to deterioration. It is in response to these needs that a new course was built. The course is called Concord Hospital Emergency Assessment, Recognition, and Stabilization (CHEARS). It models American Heart Association’s Pediatric Emergency Assessment, Recognition, and Stabilization© (PEARS) course, with material adapted for the adult population of patients (PEARS Provider Course - American Heart Association International, 2021).
Study of the Intervention

To establish direct feedback a survey using Qualtrics™ was sent to nine staff from this local hospital. An initial pilot of this class was conducted on March 27, 2024. There was a total of 6 participants. This group included a nurse educator from the Progressive Care Unit (PCU), a nurse educator from the observation units, a nurse educator from the medical-surgical unit, and a nurse manager of the Telemetry Care Unit. Additionally, two nurses who graduated in 2023, who had not yet completed the Nurse Residency Program, were also included in the pilot. After the pilot implementation, adjustments were made based on observations by instructors as well from feedback of participants. On April 18, 2014, a class was held with seven participants. This group included a clinical lead of the Respiratory Care Unit (RCU), a clinical lead of the medical-surgical unit, a clinical lead of the Progressive Care Unit, and a night shift nursing supervisor. This first course also included three point of care nurses, one from RCU, one from the medical-surgical unit, and one from PCU. These point of care nurses were not included in the survey due to the nature of the questions. The survey was also sent to a member of the Quality Assurance Department that has been trending event reporting in relation to clinical deterioration for content validity.

Measures

The first questions about the perception of preparedness asked Currently, do you feel staff are prepared to recognize and respond to patient deterioration? Three options including most of the time, about half the time, or rarely were offered. The second question asked Are you supportive of the creation of CHEARS to improve recognition and response to patient
deterioration? Participants were asked to choose: definitely not, probably not, might or might not, probably yes, or definitely yes. Question three asked participants How likely are you to encourage staff to take or enroll staff in CHEARS? Answer options included extremely unlikely, somewhat unlikely, neither likely nor unlikely, somewhat likely, or extremely likely. Question four was an opened question that asked What other information would you like to share about CHEARS?

Analysis

The survey questions included response options in categories. Therefore, descriptive statistical analysis for quantitative data noted frequency and percentage. In addition, free text options were available and qualitative data comments analyzed noting patterns and themes.

Ethical Considerations

A gap analysis is a form of quality improvement. It is exempt from a full Institutional Review Board (IRB) review. Therefore, there are no ethical considerations. However, participation in the survey and providing comments was not mandatory so consent was implied with participation. Enrollment in this course is voluntary.

Results

Survey

Seven of the nine recipients responded to the survey. All respondents reported staff are prepared to recognize and respond, “about half the time.” All respondents reported that they
would be “Extremely likely” to encourage or enroll staff in this new course. All respondents reported “Definitely yes” to their support of the creation of CHEARS to improve recognition and response. Respondents also contributed the following comments in their survey:

“This is a great way to prepare for the rapid response - an event which can help patients due to recognition of deterioration- a guide for working through a rapid response. This is a supportive training and technique for preceptors to guide a new RN through during orientation.”

“This class has the opportunity to create a uniform way to assess the deteriorating patient which can increase effective communication in stressful situations.”

“I would like my staff to gain independence in assessing and intervening when a patient decompensates. I think this class provides a wonderful educational framework for nurses to grow and gain confidence in the area.”

“Excellent class format and content. It will be very beneficial to staff.”

“This was an incredibly well done, engaging class that I feel all nurses should be encouraged to take (new grads at-least 8 months after hire-no sooner)! Great Job!”

“I support it wholeheartedly and want to plan who goes and be able to support then on the unit using it on their patients to help support active learning- the learning that happened in the Sim Lab then we need to plan out support to make it real at the bedside and support the process there as an educator team/ clinical leader team.”

Initial Steps of the Intervention and Evolution
To establish support of CHEARS, there will need to be approval of funds for this education day. When initially building this course, it was thought to be an eight-hour day, only slightly shorter than the ten-hour ACLS-Update course or the twenty-hour ACLS-Initial course. Upon completion of the pilot, it was believed the course could be completed in six-hours. That theory was tested successfully on April 18, 2024, with the first class. To increase support of this education day it will be argued that not only is the content more appropriate for staff in non-critical care areas, but the cost is several hours less than ACLS-Update and many hours less than ACLS-Initial. It will also be highlighted that the number of RRTs in comparison to Code Blues makes this course more appropriate. Additionally, all bedside staff are required to maintain AHA’s Basic Life Support (BLS) course completion every two years as well as the defibrillation competency in Automated External Defibrillator (AED) mode or full use capability (Basic Life Support, n.d.). These two pieces of training help staff to prepare for the first few minutes of a Code Blue until the code team arrives. The belief that acquiring an ACLS course completion, or attending Code Blue Team Training, will make you more prepared for recognition and response to deterioration is a not supported by evidence-based data. The content of both of those offerings focuses on cardiac and respiratory arrest in the adult.

The course will be offered once per month for the remainder of 2024. It is built with existing space and instructor availability for six to seven participants. We have the resources to increase the opportunity for to twelve to eighteen participants. In 2025, the course could be offered twice per month.

Staff, educators, and members of the leadership team should be surveyed to determine the rationale behind requests for the ACLS courses from areas that do not require it. There are times
this is an appropriate request due to career goals and growth to higher acuity areas. However, it can be argued that the CHEARS course remains the better option for growth for additional training until some experience is gained in those higher acuity settings.

Additionally, the course should be incorporated in the Nurse Residency Program in 2025. Two of the participants from 2023 Nurse Residency were included in the first course. They were able to give feedback that the content would have been overwhelming before approximately nine to twelve months of experience. This will need to be considered before implementing changes to the program. The content could improve patient outcomes and the confidence of the newly graduated nurses. However, if this new approach occurs too soon, the training would not be helpful.

Discussion

Summary

The goal of this gap analysis was to improve recognition of clinical change. This led to a request for an increase in education for the nurses at the point of care who are not in critical care areas that require ACLS completion. The current education offerings may not always be appropriate. Staff experience has decreased, staff ratios are increased, and patient acuity is increasing. A key finding is that nurses at the point of care must be better prepared to recognize a clinical concern from an “across the room” glance. When a concern about this assessment occurs, nurses must be prepared to make a rapid, systematic assessment and prepare interventions to stabilize the patient and prevent further deterioration. Prior to the creation of this
course, there were no educational offerings for the recognition of clinical deterioration in the adult patient population.

**Interpretation**

The CHEARS course was created to help meet the educational needs of nurses at the point of care in non-critical care areas to improve outcomes for the patients. This course is designed to enable the nurse to learn a rapid, consistent assessment in the presence of clinical deterioration. The systematic approach teaches a method that is consistent, so nothing is missed. This course teaches the participants to learn to anticipate interventions that will be requested with the SBAR or RRT activation. The course has received positive feedback from participants so far. Requests for available participants slots in courses are filling quickly.

This course emphasizes the nurse’s utilization of the assessment from the *across the room* to pivot from the intended purpose of the patient interaction to a systematic approach in assessing when the nurse has feeling of concern or makes observations of change. This course is intended to increase the confidence of non-critical nurses to act on their feelings of intuition and determine clinical findings to activate appropriate help for the patient. This approach helps support evidence in the literature concerning for the need for validation of vital sign changes before notifying the provider. The systematic approach emphasizes the consistency in responding when clinical change is detected. This course also allows for practice in delivering a SBAR to facilitate appropriate interventions with improved communication. The course is intended to increase the confidence of nurses when they have less resources to call upon due to lack of
Implementing Change: Training for Adult Emergency Assessment, Recognition, and Stabilization for Novice and Non-Critical Care Nurses

experience in the team, increased patient to nurse ratios, and less training in preparedness due to the pandemic.

Recommendations

Promotion of the class and its content will need to occur. Support from unit educators and members of leadership will be necessary. The content of this new course is most appropriate in areas where the ACLS course is not required but can be offered as a steppingstone for the new nurse in intermediate care settings. This course does require a six-hour educational day, creating the expense for both educators and participants. However, the education team facilitating is also the team for ACLS courses. This course should lessen the time burden on those instructors by reducing education hours with less ACLS courses. The CHEARS course is fourteen hours less of education time than the ACLS-Initial course. Highlighting this fact should aid in support. It is also reasonable to expect attendance to a six-hour class and be able to work three 12-hour point of care shifts to avoid an added strain of staffing. Typically, when attending the ACLS-Initial course, participants would not be expected to work a full clinical week. The biggest challenge will be in changing policy of what is currently required. There may be some opportunity to change policy at the hospital level, but there may be a bigger barrier in making change in requirements from regulatory bodies.

To promote the class to possible participants, a flyer was created and sent to educators and members of leadership. It was also loaded into the online educational system of the hospital. Educators and members of leadership were invited to attend the run-through and initial class to assist in awareness of content and to provide feedback. In conversations with these stakeholders
the emphasis on content and the application to improve patient outcomes is being emphasized. Also, the decrease in education time and schedule availability is highlighted in these conversations. Promotion seems to be effective. Class size will be increasing to 14 participants by June of 2024.

**Potential Resources**

Consideration should be made for changes in policy that require the ACLS course. For example, should it be the requirement for nurses to complete and maintain the ACLS course in areas such as the Post Anesthesia Care Unit? In this area there is always the presence of a licensed anesthetist. Additionally, should we require our nurses that are working remotely and providing Telehealth services to maintain completion of the Basic Life Support (BLS) course? Current policy requires that all nurses maintain the BLS course every two years. It begs the questions, why do we utilize resources for remote workers to maintain this? With policy change, there would be less need for BLS courses, opening more resources for courses like CHEARS.

**Limitations**

There are currently only three instructors that have a thorough understanding of content to be able to teach to both the didactic and simulation components. This includes the debriefing to focus on the learning objectives. It is intended that other possible instructors will gain knowledge through observing the didactic, familiarizing themselves with the material, and acting as the standardized patient to gain understanding of simulated scenarios. The current instructors are proficient in simulation and debriefing techniques. Therefore, the additional instructors will need more onboarding and support. The time to educate these new instructors will not be of
additional cost to the budget, but at a cost of available hours in a work week to other responsibilities.

Limitations of participants may be an issue due to staffing deficits. It is the intention that this six-hour class will not impact the ability of the participant to work three 12-hours clinical shifts. Authorization for the additional two hours of overtime pay for participant is necessary. It is anticipated that this will be supported because of the decrease in resources and cost for ACLS-Initial course. This will be particularly true of departments where the ACLS course is not required. The reduction is significant when comparing the twenty hours of education the ACLS-Initial course, compared to a six-hour CHEARS course.

There is no concern for physical space, printing of paperwork, availability of manikins or other items to increase fidelity. These items, including monitors for generating vital signs already exist in the Simulation and Education Center. No additional purchases would need to be made. The printing of course material is never a budgetary concern. If printed material became significant, there is an internal copy center for large orders.

Conclusion

A gap in educational offerings was identified. It was in response to the current post-pandemic state. Due to an increase request for ACLS-Initial classes, which is not always the most appropriate content of the nurse at the point of care for the adult inpatient non-critical units, a course was created. This course teaches the nurse to enter every patient encounter with a quick “across the room” assessment that determines if the nurse proceeds as planned or assesses for concerning clinical changes. If concerning clinical changes are observed, the nurse then proceeds
with a systematic rapid approach to assessment to determine the types of interventions to anticipate for stabilizing the patient and prevent further deterioration.

The success of the outcomes of the course will be measured by the trending of RRT and Code Blue data to reflect our patient outcomes. Nurses will be surveyed on their subjective measurements of confidence in recognizing and responding to clinical deterioration. Tracking of educational hours, with the focus on the increase of CHEARS course offerings rather than the ACLS-Initial course, when it is not required, will be an important measurement.
References


