2014 Gage Awards

Reference #	7490610
Status	Complete
Name of hospital or health system	Harbor-UCLA Medical Center
Name of project	Detecting and Managing Deterioration in Children Using the Pediatric Early Warning Score
CEO name	Delvecchio Finley
CEO approval	Check here to confirm that your CEO approves of this project being submitted for a 2014 Gage Award
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Within which of the two categories does your application best align?	Quality

1. Provide a brief description of the project. (This section should resemble an abstract for a poster presentation or an abstract for a peer reviewed journal. Include an objective, data sources, study design, findings, and conclusions.)	Background: The incidence of cardiopulmonary arrest in hospitalized children is low, ranging from 0.7-3%. Mortality from in-hospital arrests ranges from 50-67%. Almost three-quarters of children who suffer an in-hospital arrest demonstrate warning signs up to 18 hours prior to arrest. These statistics indicate that failure to recognize and treat clinical deterioration remains a source of serious preventable harm for hospitalized children. PEWS is a severity of illness score developed for hospitalized children. This standardized assessment tool uses objective criteria from routine observations of behavior, cardiovascular status and respiratory status. The impetus for this project was the "unexpected" cardiopulmonary arrest on our pediatric ward of a 9-month old ex-25 week gestation infant who had been admitted for vomiting. During the root cause analysis, it was noted that the infant had signs of clinical deterioration hours before his arrest. One of the findings was the lack of standardized processes for documentation of clinical deterioration and escalation of care. Objectives: The goal was to create a system whereby clinical deterioration would be identified in a timely fashion and a goal-directed, time-bounded care plan could be implemented with a defined strategy for escalation in care, if needed. Study Design: Prospective, observational. Structures and processes to support implementation of PEWS included adoption of a standardized risk assessment tool (PEWS), training of pediatric nursing and medical staff, creation of an interdisciplinary form, and development of visual aids such as posters with PEWS criteria and standardized actions for staff reference. Findings: During the four months after implementation, there were 613 admissions to the pediatric ward with an age range of 7 weeks-19 years. 13 Sick Kid Forms were generated due to a PEWS score of +/>3. - 3 patients required transfer to PICU - 1 patient was moved to a Step Down bed - 9 patients were managed on the ward 12 patients required transfer to the Pediatric ICU (PICU) not in response to a PEWS score. Three of these patients were incorrectly scored, two were transferred for procedures and seven had deterioration/clinical changes in between scoring periods. After implementing PEWS, 87% of nurses knew to whom to voice concerns about a patient compared to 47% before PEWS. 93% of nurses felt supported when voicing a concern about a patient to the interdisciplinary team compared to 60% before PEWS. Conclusions: Implementation of PEWS has been a useful strategy to remove barriers that prevent timely referral of children who are deteriorating and require immediate help. PEWS has

	enhanced multidisciplinary team communication and encourages efficient and appropriate resource utilization. PEWS alone is not a substitute for clinical judgment but rather an adjunct. Because it is a “snapshot”, patient changes in between scores may warrant escalation of care.

2. Describe the methods use in this project. Include where, why, and how the project was accomplished.	Our project was implemented to identify the deteriorating pediatric patient, mitigate the causes, if possible, and escalate level of care as needed. Objectives were: - Provision of a clear, standardized assessment process - Early identification of children who are deteriorating outside the PICU - Alert the multidisciplinary care team to signs of deterioration - Remove barriers that prevent timely referral of children who are deteriorating - Improve interdisciplinary communication - Enhance understanding of signs/symptoms of clinical deterioration - Empower nursing staff to call for assistance - Develop predictable responses by all levels of the interdisciplinary team A multidisciplinary team was assembled in December, 2012. Members included: Director for Patient Care Services for Pediatrics, Pediatric Ward Nurse Manager, Pediatric Ward Medical Director, Pediatric Clinical Nurse Specialist (CNS), PICU Nurse Manager, Pediatric Intensivist and PICU CNS. A review of the literature was conducted. We selected the original PEWS tool published by Monaghan as our standardized assessment tool. A score of 0–3 is given for each of three domains: behavior, cardiovascular status, respiratory status. An additional 2 points are given if the child requires nebulizer use every 15 minutes or has persistent vomiting after surgery. Scores are summed; the total score ranges from 0-11. A total score of =/>3, or score of 3 in any one domain, may indicate that the patient is at risk for clinical deterioration. We identified standardized and specific actions assigned to each healthcare team member based on PEWS score. A PEWS score =/>3 earned by the patient generates a defined, time-bounded, goal-directed action plan as well as a carefully designated group of multidisciplinary medical personnel that would evaluate the child based on the score. A score of 6 or greater calls for transfer to the PICU. Visual resources of the PEWS tool and Actions to Take were placed at each child's bedside. Finally, we developed a form (Sick Kid Form) on which physicians and nurses document PEWS team response when PEWS is =/>3. The form requires documentation of team member notification and response, plan, deadline for plan objectives being met and reassessment. A one-hour education program was implemented for nursing and physician staff. Although PEWS is intended to be used on an acute care pediatric unit, nurses working in all of the inpatient neonatal and pediatric units were required to attend the training because nurses float between these units. With the assistance of a central educator, the Pediatric ICU CNS conducted 12 classes. One-on-one and small group sessions were held to capture staff that were unable to

	attend the classes. Similarly, the Pediatric Intensivist held classes for all pediatric residents. The class was didactic in nature using case-based lessons. Following training, PEWS was implemented on May 1, 2013.
3. Describe the results of the project. What data was used to support improvement results?	During the four months after implementation, there were 613 admissions to the pediatric ward with an age range of 7 weeks-19 years. During that time, 13 Sick Kid Forms were generated due to a PEWS score of =/>3. Based on the outcomes of the interventions or decisions made because of the PEWS score: - 3 patients required transfer to the PICU - 1 patient was moved from a ward bed to the Step Down Unit for higher level of care - 9 patients were able to be managed on the ward after response to their goal-directed care plan. Interestingly, 12 patients required transfer to the PICU not in response to a PEWS score. Three of these patients had incorrect scoring on their PEWS, 2 were transferred for procedural needs and 7 had deterioration/clinical changes in between the scoring periods. Three months following implementation, nurses were surveyed and asked to provide feedback related to healthcare team communication and response. After implementing PEWS, 87% of nurses knew to whom to voice concerns about a patient compared to 47% before PEWS. Additionally, 93% of nurses felt supported when voicing a concern about a patient to the interdisciplinary team compared to 60% before PEWS.
3A. Attachment, if applicable (Only graphically displayed data such as charts will be accepted. Data should include baseline and improvement data)	PEWS_Staff_Questionairre_Results.pdf (138k)

4. Describe what happened as a result of the project. Was the improvement related to the intervention? Can the project be duplicated by other organizations?	The major improvement was the ability for nurses to know when to call and who to call for their patients who are deteriorating. Nurses also feel more supported when they do express their concerns. Implementation of PEWS has been a useful strategy to remove barriers that prevent timely referral of children who are deteriorating and require immediate help. PEWS has enhanced multidisciplinary team communication and encourages efficient and appropriate resource utilization. It is currently unknown if the patients who were transferred to a Step Down Bed or PICU bed would have been transferred before the implementation of this project. Seven of 12 children transferred to the PICU not in response to a PEWS score had deterioration/clinical changes in between the scoring periods. This is a reminder that PEWS alone is not a substitute for clinical judgment but rather an adjunct. Because it is a “snapshot”, patient changes in between scores may warrant escalation of care. Based on this early analysis of data, it is clear that there is a need to increase knowledge about scoring through case based educational modules. The three patients who received inaccurate PEWS scores were at high risk for further deterioration had they remained on the general pediatric unit. This project could be easily duplicated by other institutions. The PEWS project did not require additional funding except that needed for creating the bedside visual aids. PEWS was implemented at our institution based on the need for clear interdisciplinary communication and standardized responses to the deteriorating child.
5. Describe how patients, families, and if appropriate, community was included in the work.	Prior to implementation, the PEWS project was shared with executive leadership, as well as the Patient Safety Officer. Project outcomes have been shared with executive leadership, Patient Safety Officer, and staff. Our poster, “Pediatric Early Warning Score (PEWS): Detecting and Managing Deterioration in Children” was presented at the 2013 Los Angeles County Department of Health Services Patient Safety Conference. Families were not directly involved in this project but they have indirectly benefitted from the work by hopefully limiting or potentially eliminating preventable harm for their child.
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