Implementation of an Early Warning System to Decrease Intensive Care Unit Transfers

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Abstract

Problems & Purpose: Extended periods of unrecognized clinical deterioration lead to increased intensive care unit (ICU) admissions and mortality. When deteriorating patients are recognized, appropriate interventions can be implemented, which leads to a decrease in unplanned ICU admissions and improved outcomes. The ability to detect deterioration requires critical appraisal of assessment data, and evaluation of trends. Early warning systems (EWS) have been shown to help clinicians predict deterioration based upon objective physiologic parameters and assessment data. At a 187-bed hospital in Western Maryland, no standardized protocol existed to aid in the detection of early deterioration. Current practice is calling the rapid response team (RRT) based upon a single vital sign or symptom. Retrospective chart review of RRT calls, discovered patients often exhibited deterioration several hours before recognition.

Methods: The purpose of the quality improvement project is to implement an EWS, specifically the national early warning system 2 (NEWS2), in a medical-surgical intermediate care area (IMC) to increase early recognition of clinical deterioration. Process measures monitored during implementation included compliance with calculating and accuracy of the calculated NEWS2 score. Outcomes included rate of ICU admissions and rate of RRT calls.

Results: Throughout the twelve-week implementation phase, compliance with NEWS2 score decreased from 86% during week one of implementation, to 26% in the final week, however NEWS2 score accuracy increased from 86% in week one to 94% in the final week. Pre-implementation the rate of RRT calls for the IMC were 7.2 per 1000 IMC patient days (IPD) and 30.7 per 1000 IPD post-implementation. The rate of ICU transfers was 26.5 per 1000 IPD pre-implementation and 16.1 per 1000 IPD post-implementation.

Conclusion: Overall uptake of the intervention was low, desired outcomes of increased RRT calls and decreased ICU transfers was achieved. Plans to overcome compliance include integration of the NEWS2 in the electronic medical record (EMR). NEWS2 integration into the EMR with best practice advisory may increase compliance by decreasing the workload of score calculation and providing a notification for staff that must be acknowledged. NEWS2 education for new hire orientation may increase compliance and foster a culture of patient safety.

Introduction

Failure to rescue (FTR) is the idea that not all complications are preventable but, healthcare organizations should be able to quickly identify when complications are present and quickly act to mitigate deterioration, disability, or death. Extended periods of unrecognized deterioration lead to increased mortality. When deteriorating patients are successfully recognized and appropriate interventions are provided, literature has reported a decrease in unplanned intensive care unit (ICU) admissions, decrease in mortality, and decrease in length of stay (LOS) (Kitto et al., 2015). Many of these FTR events are considered preventable severe adverse events because patients exhibit signs of clinical deterioration hours before the event (Padilla et al., 2018).

At a 187-bed community hospital in western Maryland, for the fiscal year 2018, there were a total of 967 adult inpatient RRT calls, for a total of 806 patients, with an overall hospital RRT call rate of 11.52 per 1000 patient days. Of those patients who experienced an RRT, 37% transferred to another unit. Transfers to higher levels of care result in an increased LOS, increased cost, and increase mortality.

The ability to quickly identify these patients and rescue in place has been shown to improve clinical outcomes. The ability to detect deterioration takes a trained eye, critical appraisal of diagnostics, patient assessment data, and trends. The use of an objective early warning system (EWS) can assist clinicians to recognize the risk of deterioration based on physiologic parameters and assessment data that provide a numerical value for deterioration.

The purpose of this quality improvement project is to implement a protocolized early warning system, specifically the NEWS2, on a mixed medical-surgical immediate care unit to assist staff in the timely recognition of deterioration at the first sign of physiological

changes. With the successful implementation, the expected outcomes are to increase RRT calls and decrease ICU transfers.

Literature Review

The use of an EWS has been shown to decrease mortality, decrease the length of stay, and decrease unplanned ICU admissions. There are multiple EWS and risk stratification tools available to hospital organizations to objectively apply a numerical value to deterioration. Many organizations have implemented an algorithm or protocol to work in tandem with the EWS, because, scores from the EWS are only useful when they are acted upon quickly and with the appropriate interventions and follow-up.

Three studies reported that the use of an EWS decreased unplanned ICU admissions (Mathukia et al., 2015, Mestrom et al., 2019, and Sutherasan et al., 2018). All studies were performed at a single center and used a protocol in conjunction with an EWS. Mathukia et al., (2015) conducted pre and post-implementation retrospective observational study with a primary outcome measure of mortalty, and took place at a community hospital with less than 200 beds. Previously, this hospital had not used an early warning system (EWS) and piloted the project on their medical-surgical units (Mathukia et al., 2015). In contrast, Sutherasan, et al., (2018) conducted a prospective observational cohort study with a pre-protocol control group and a protocol group. The study setting was a large university hospital that already had an EWS integrated into their charting and was performed in Thailand at a university hospital of unknown size. Although, Sutherasan, et al., (2018) did not implement an EWS, but rather strengthening the EWS with the use of an associated rapid response and monitoring protocol, since studies show that an EWS is just a number unless staff knows how to appropriately act on the number

calculated. This was key for project design since calculating a numeric value does nothing to assist or alert the RRT.

The study by Mestrom et al., show that here was no significant decrease in unplanned ICU admission from the pre-implementation period to the post-implementation period. There was however increased compliance and accuracy with the EWS once automated into the EMR. Limitation to the study discrepancies of data due to moving from paper charting to an automated EMR and during the pre-implementation period resulted in data that missing.

One systematic review had mixed outcomes on the use of an EWS to decrease ICU admissions, 21 total articles were reviewed and only five had an outcome measure of unplanned ICU admissions. These five studies had mixed reviews with 2 articles having an increase in ICU admissions but they were not clinically significant (Smith et al., 2014). Two studies show no difference in the number of ICU admissions pre and post-implementation (Smith et al., 2014). Only one study had and decrease in ICU admissions from the general units (Smith et al., 2014).

Based upon the Johns Hopkins Evidence-Based Practice (JHEBP) model three of the articles by Mathukia, et al., Mestrom et al., and Smith, et al., are graded a level IV for level of evidence and the article by Sutherasan, et al., is graded a level III for evidence, since the study did have a control group but there was no randomization present (Dang et al., 2018). The articles by Sutherasan, et al., were graded a level B for quality while the article by Smith, et al., was graded a level C for quality since the article lacked statistical evidence and there was sampling bias of the articles that were included (Dang et al., 2018).

Theoretical Framework

Lewin's Change theory is the theory used to structure the implementation of the protocolized EWS. Lewin's change theory consists of three phases unfreeze, change, and refreeze (Wojciechowski et al., 2016). During the unfreeze phase, it was determined that the institution had opportunities for improvement in the timely recognition of patient deterioration. Key stakeholders were committed to change and supported implementation of the NEWS2 and staff were committed to unfreezing by exploring a different RRT trigger method to improve patient outcomes. The change phase required frequent communication with team members on both the IMC and the RRT, appraisal of barriers that might arise during implementation, sharing of current data with team members, and promoting change from current practice. In the refreeze phase sustainability is promoted, with a clear plan for success in the future, which includes integrating the NEWS2 into the EHR, and hospital wide education to promote a culture of the organization for a lasting change (Wojciechowski et al., 2016).

Hospitals are considered complex adaptive health systems, and once a change is made, that specific change can alter how other systems of function interact with each other. It is important to have a theoretical framework like Lewin's that can allow for frequent appraisal of how implementations and projects affect others and allow for the process to unfreeze to accommodate for those conflicts (Wojciechowski et al., 2016).

Methods

On a 20-bed mixed medical surgical IMC, that provides care for an average of 210 patients a month with an average length of stay of 2.6 days was the setting for implementation. This unit is staffed by 32 RNs that are associate and bachelor's degree nurses. Due to the drastic changes in vital signs at end of life and the focus of care shifting towards comfort rather than preserving

life hospice patients, patients with a code status of do not resuscitate comfort measures, or DNRB were excluded from this project.

Education about the NEWS2 and how to use the NEWS 2 scoring tool form (See Appendix B) was distributed to nurses on the IMC. Once educated about the NEWS2 scoring tool, nurses were given a post-test that consisted of two case studies and a total of four questions to evaluate education effectiveness. NEWS2 scoring forms were distributed every shift by the charge nurse. These forms were used to audit uptake of the intervention and assess accuracy of the NEWS2 calculation. To increase compliance with the NEWS2 score calculation and form completion, weekly raffles were held, staff was provided a raffle ticket for every form completed for the week, and two tickets were drawn weekly for gift cards. In addition, weekly breakfast and dinners for dayshift and nightshift were provided to incentivize staff to increase compliance. Every week forms were analyzed, data collected included the daily unit census, transfers to the ICU, RRT calls, number of forms collected, number of possible forms collected, and accuracy of the forms. Originally charts were reviewed to determine if the appropriate interventions were documented for each score but after week two of the project, the forms was changed to reflect the intervention and entire documentation process moved to paper. Data were displayed on the unit white board to reflect NEWS2 form data on unit outcomes in the form of run charts with rates of transfers and RRT calls, and percentage of accuracy and compliance were provided.

Results

During the project period there were 423 IMC patients, 36 RRT calls and 18 transfers to the ICU. During the implementation compliance with calculating the NEWS2 score (See Figure 1)

was variable from 15-86% with a median overall compliance with NEWS2 calculation during the project period being 53%. Accuracy, however (See Figure 2) was consistently high with a median of 90% during the implementation period. Although compliance was lower than expected throughout implementation, accuracy of the correct score calculation remained consistent. Furthermore, RRT calls (See figure 3) increased from a median of 5 per 1000 IMC patient days pre-implementation to a median of 26 per 1000 IMC patient days post-implementation, and transfers to the ICU (See Figure 4) from the IMC decreased from 34 per 1000 IMC patient days in the pre-implementation period to 10 per 1000 IMC patient days during in the implementation period.

During implementation process changes for trigging an RRT were augmented to include the use of a NEWS2 score of 8 or greater. Previously, to trigger the RRT solely relied on a single vital sign parameter, chest pain, or stroke like symptoms. Additionally, bedside nurses would consult the RRN for patients that they felt were deteriorating but, the patient had not significant vital sign to prompt a code RRT. These patients were labeled at “awareness patients” and the RRN would assess the patient and review their chart. With the addition of the NEWS2 score tool the RRN was made aware of patients with a score of 5-7.

Use of the NEWS2 scoring form had greatest benefit in the 5-7 score (orange) category, with the appropriate associated intervention being to alert the charge nurse, RRT nurse, and provider. This intervention led to a collaboration among nurse, RRT nurse, and provider to more closely assess the patient across the deterioration trajectory and intervene. When the NEWS2 score was 8 or greater, the appropriate action was to call a code RRT, which is where

the compliance declined, some staff felt it easier to call the provider and RRT nurse to see the patient, instead of calling a code RRT which would have lead to additional staff at the bedside and additional charting. This led to awareness of the patient which subsequently led to an intervention or transfer.

Discussion

During implementation there was poor compliance with the NEWS2 scoring tool, staff felt that to manually calculate the score and complete the form was time consuming. Staff voiced concerns that the felt the forms added additional work load when vital signs were automatically in the computer and having to re-write them on the form to calculate. Implementation of the NEWS2 form led to process changes for the RRT activation, post implementation on the IMC the prompt to call a RRT was a score of 8 or greater, pre-implementation calls were based on a single vital sign. Initially during implementation NEWS2 scores were to be calculated every four hours with vital signs. After staff grievances related to the time needed to calculate on paper forms, NEWS2 calculations were changed to once per 12-hour shift.

When comparing data from pre-implementation to post-implementation there was decrease in the rate of transfers from the IMC to the ICU. It is unlikely that this decrease was solely due to implementation of the NEWS2 scoring tool since only about half of the IMC patients received a NEWS2 score. During the pre-implementation period provider coverage for the IMC was the hospitalist service which was an advanced practice provider that covered all inpatients outside of the ICU. In week 1 of implementation, however, the provider staffing model changed to include an intensivist in the IMC due to the increase in complex patients and high risk COVID-19

patients. With a lower provider to patient ratio and critical care knowledge of the intensivist it is likely that this contributed to the decrease in transfers. Additionally, during this time there was limited ICU bed availability due to the second surge of the COVID-19 pandemic, and many patients that required transfer lead to an increased use of palliative care and supportive care for end of life decisions.

During implementation the majority of the patients on the IMC that scored 8 or greater were COVID-19 patients requiring high levels of non-invasive positive pressure ventilation. These patients were well known to the RRT nurse and the provider, so no RRTs were called on these patients due to the disease trajectory and waiting for the need for intubation. Many of these patients were made do not resuscitate B (DNRB) before every being transferred to the ICU.

Based on the literature review and article by Mathukia and associates (2015) when implementing an EWS which includes the RRT in the protocols, there is an expected increase in RRT calls and a decrease in ICU transfers. Not all RRT calls are associated with a patient that is rapidly deteriorating but when a patient is intervened on in the early stages of deterioration, interventions augment the deterioration trajectory leading to a decrease in transfers to a higher level of care and mortality. The NEWS2 scoring form with associated protocol of staff to alert and vital sign frequency aimed to catch patients in the early stages of deterioration before requiring transfer to the ICU.

Limitations to this project included competing priorities, with the COVID-19 pandemic staff was stretched and managing more critical than normal patients for the IMC. The IMC was

supplemented with travelers and supplemental staffing who were unaware of the NEWS2 scoring system. Additionally there were threats to internal validity with the project design, it was observed that many times at the end of the shift staff completed the sheet and used vital signs that where hours old and not in real time, resulting in additional periods of unidentified deterioration.

Conclusion

EWS scores have shown useful in decreasing mortality and morbidity associated with prolonged periods of deterioration. This project showed usefulness in demonstrating the positive effects and potential of implementing a NEWS2 score hospital wide. Based on the results of this pilot project, the NEWS2 will be integrated into the EMR and used hospital wide for all inpatient and observation adults outside of the ICU and emergency department thereby increasing the spread of the NEWS2. With quality of care linked directly with reimbursement timely recognition of deterioration will lead to decreased mortality and morbidity, decreased ICU admissions, decreased length of stay, increased health care savings, increased quality measures, and increased revenue for the health care organization.

It is unknown when NEWS2 is expected to be incorporated into the EHR. Once adopted hospital wide and electronically calculated education will be provided to all nurses on the NEWS2 and the scoring system and significance of scores. Scores that are populated will be associated with a best practice advisory stating the intervention and requiring a receipt of acknowledgement by the nurse and provider this will lead to sustainability of the project over time.

Further quality improvement projects is needed to determine if the NEWS2 could be used in other areas of the hospital outside of the general floors such as its usefulness to triage patients from the emergency department, to place the right patient with the right level of care resulting in decrease transfers to higher levels of care. Additionally, the NEWS2 can be used as a tool for readiness to downgrade from the ICU, and decrease the rate of ICU readmissions. Lastly, the NEWS2 scoring tool can improve clinical outcomes and increase patient safety hospital-wide when implemented properly and paired with an associated protocol.

References

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Mestrom, E., De Bie, A., Steeg, M., Driessen, M., Atallah, L., Bezemer, R., Bouwman, R., & Korsten, E. (2019). Implementation of an automated early warning scoring system in a surgical ward: Practical use and effects on patient outcomes. *PLOS ONE*, *14*(5), e0213402. https://doi.org/10.1371/journal.pone.0213402

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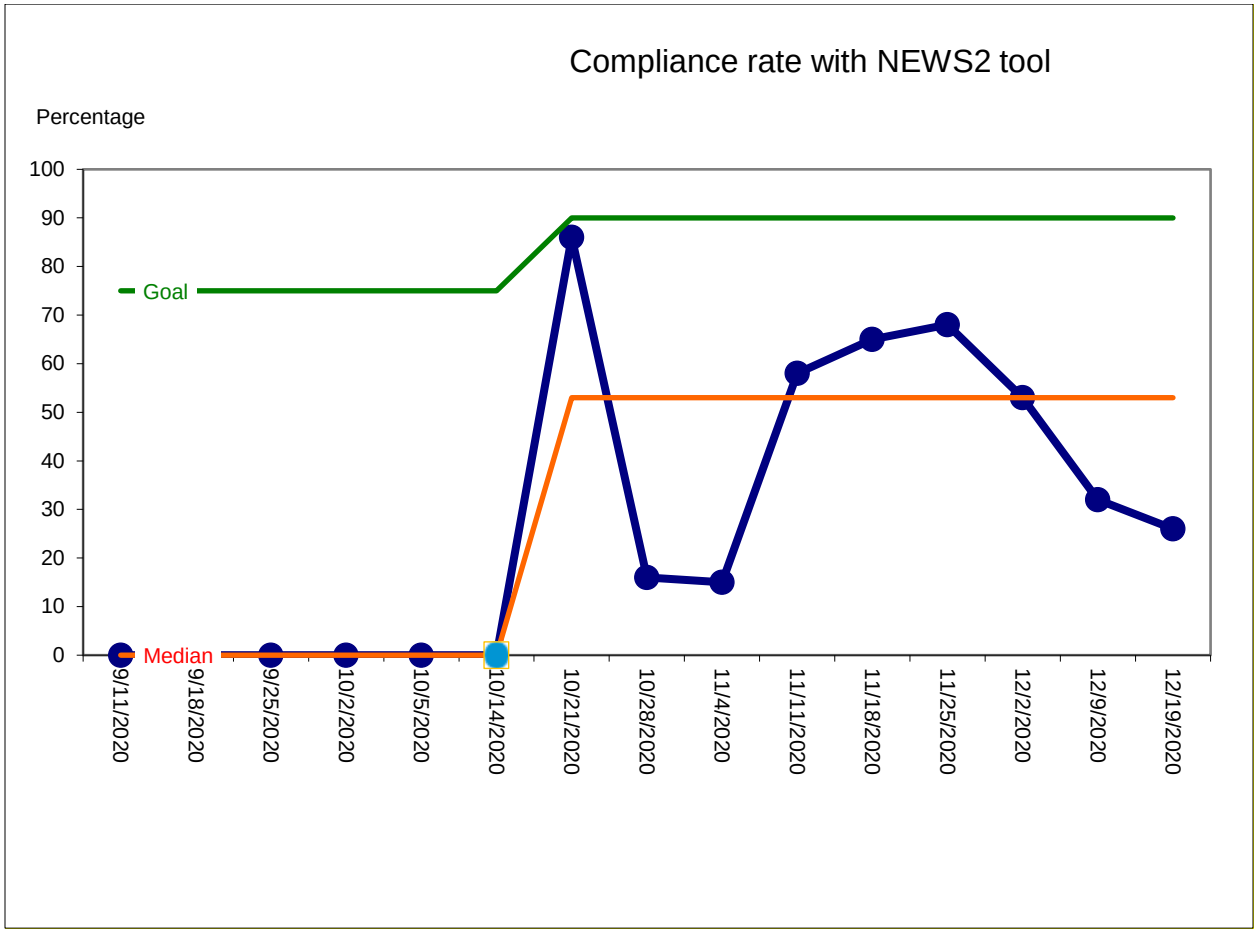
Journal of Issues in Nursing. https://ojin.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol-21-2016/No2-May-2016/Integrating-Lewins-Theory-with-Leans-System-Approach.html

Figures

Figure 1

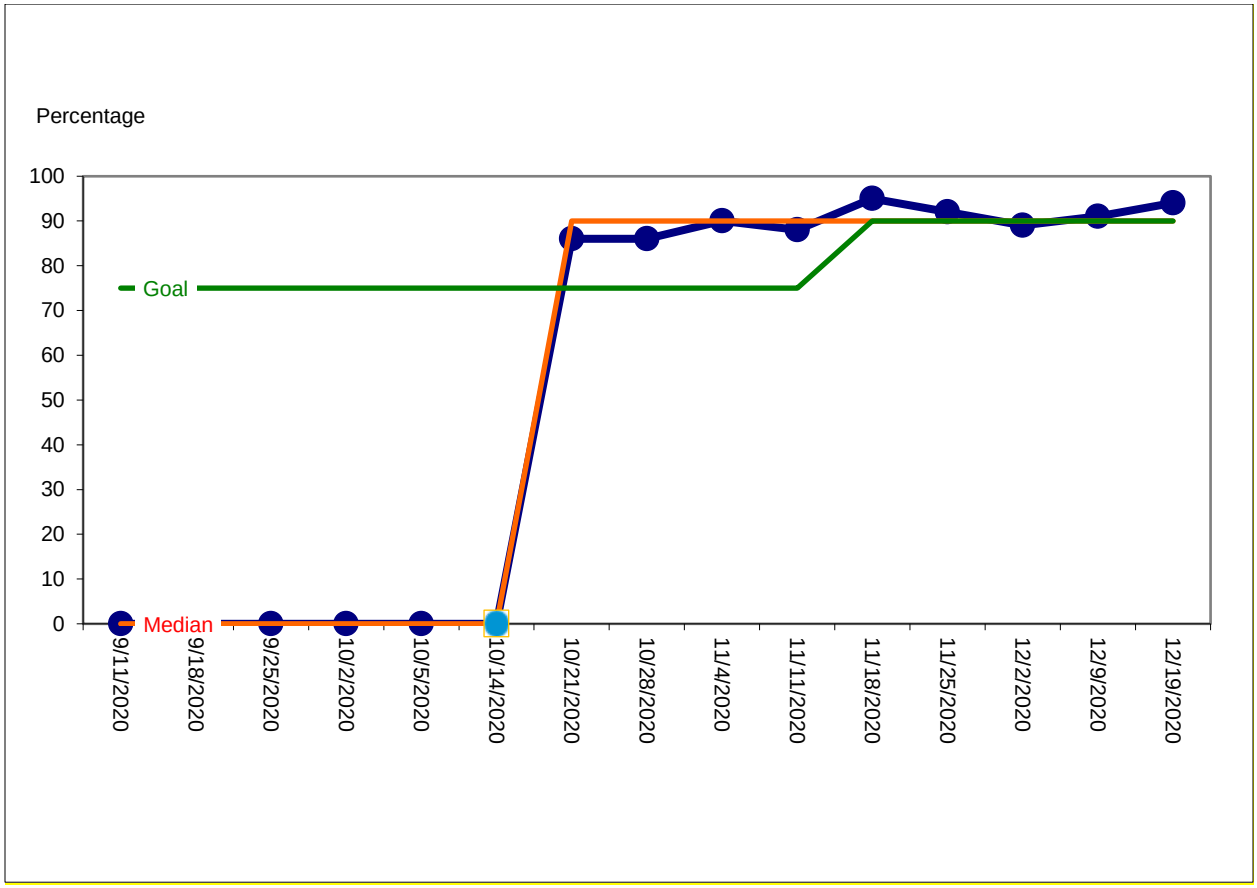
Compliance with NEWS2



Note: Implementation occurred on 10/15/2020

Figure 2

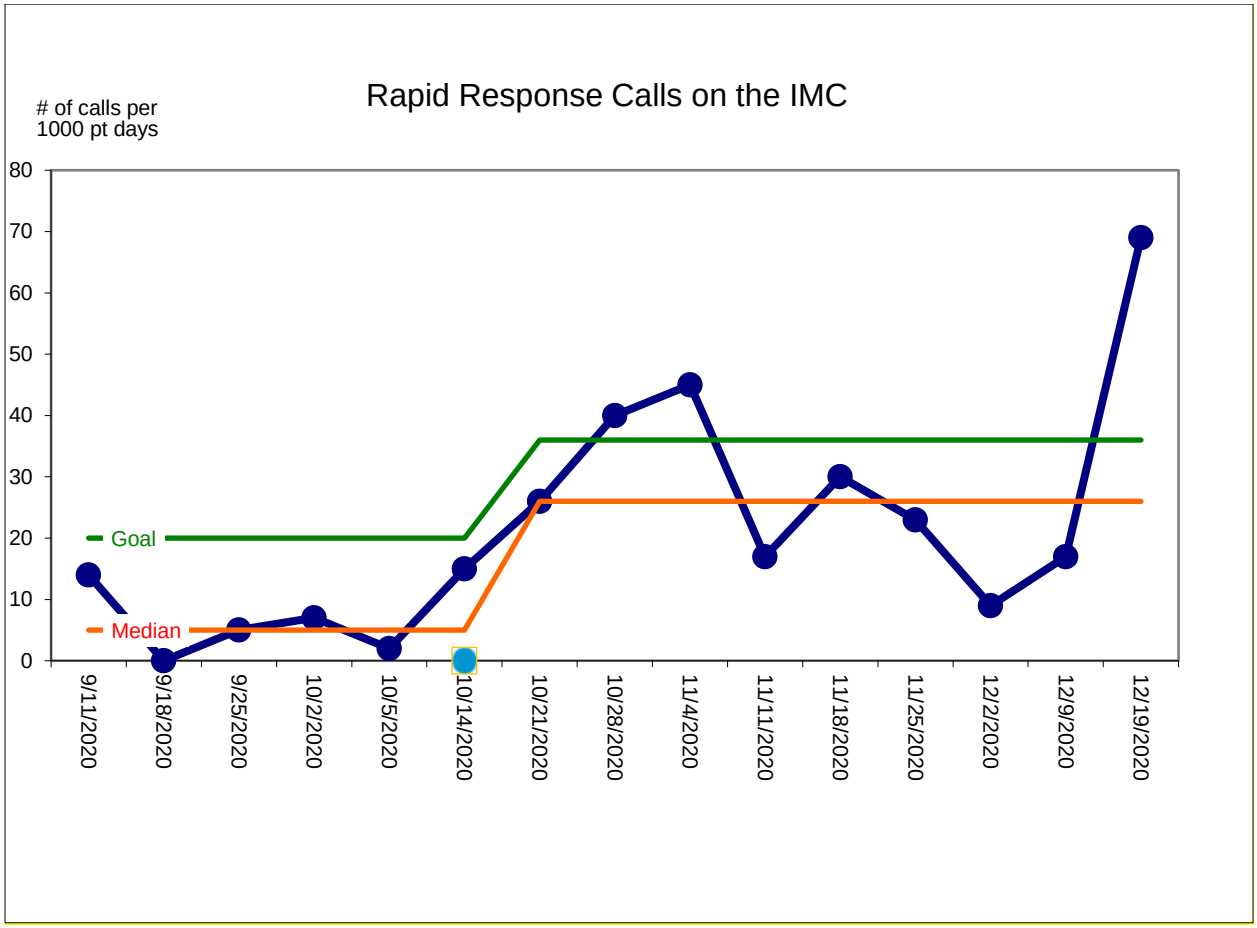
Accuracy of the NEWS2



Note: Implementation occurred on 10/15/2020

Figure 3

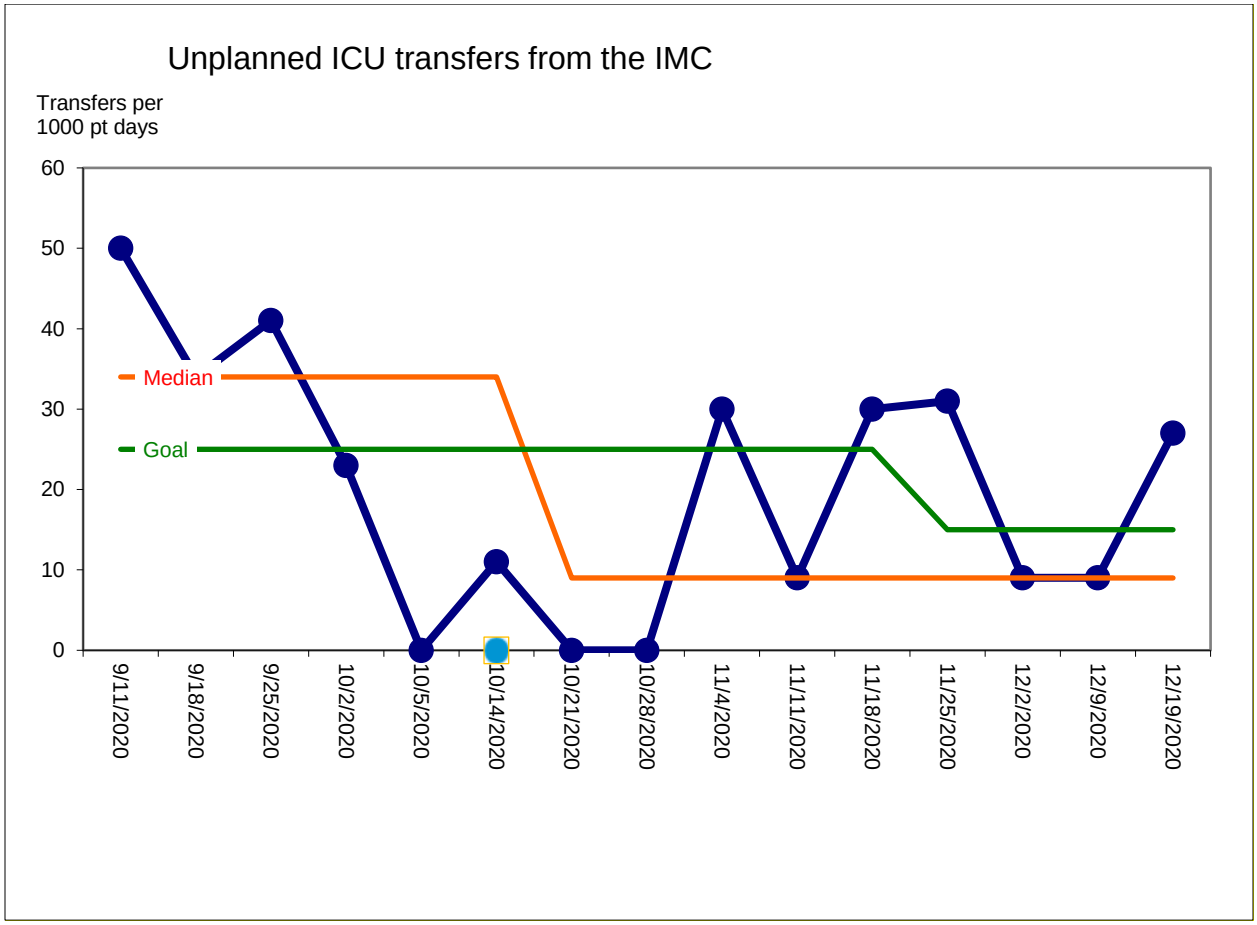
RRT Calls on the IMC



Note: Implementation occurred on 10/15/2020

Figure 4

Unplanned ICU Transfers from the IMC



Note: Implementation occurred on 10/15/2020

Appendix A: Evidence Review Table

Citation: Mathukia, C., Fan, W., Vadyak, K., Biege, C., & Krishnamurthy, M. (2015). Modified early warning system improves patient safety and clinical outcomes in an academic community hospital. *Journal of Community Hospital Internal Medicine Perspectives*, *5*(2), 26716. https://doi.org/10.3402/jchimp.v5.26716					Level IV
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
"The purpose of this study is to share experiences and the impact of MEWS implementation on patient care at an academic community hospital in Northeastern Pennsylvania."	A retrospective data review of data collected monthly on RRT calls pre and post implementation of a protocolized MEWS system.	Convenience sampling 726 patients were included in the study Inclusion Criteria: Over 18 years of age and experienced a RRT call. Accepted-726 patients Pre-implementation -384 patient were part of the pre-intervention group. Intervention-342 patients were included in the post MEWS implementation group. Power analysis and group homogeneity were not included due to study design.	Pre-implementation - group where RRT calls were based off single vital sign predictors or nursing judgement. Intervention-Implementation of a procolized Early warning system. Intervention fidelity-Staff were to calculate a MEWS score and implement an associated action dependent upon the score which included increased vital sign frequency and notifying the provider.	Dependent Variables- 1) Number of RRT calls per 100 patient-days (100PD). 2) Number of Code Blue per 100PD. 3) Result of each RRT and Code Blue (RRT progressed to Code Blue, higher level of care/ICU transfer, etc.). Measurements from RRT chart reviews in the EHR, are considered reliable.	Level of Measurement- Chi-Squared test were performed with a level of significance of p=0.01. Pre-implementation-120 RRTs had been called over 480 100PD Intervention- 176 RRTs had been called over 463 100PD (P value is 1.7E-05. This result is significant at p=0.01) Data collected showed a decrease in the percentage of RRT patients who ended up being transferred to higher level of care.
Citation: Smith, M., Chiovaro, J. C., O'Neil, M., Kansagara, D., Quiñones, A. R., Freeman, M., Motu'apuaka, M. L., & Slatore, C. G. (2014). Early warning					Level I

system scores for clinical deterioration in hospitalized patients: A systematic review. *Annals of the American Thoracic Society*, *11*(9), 1454–1465. https://doi.org/10.1513/annalsats.201403-102oc					
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
” To systematically review the evidence on the ability of early warning system scores to predict a patient’s risk of clinical deterioration and the impact of early warning system implementation on health outcomes and resource utilization.”	Systematic review	11,183 citations studies reviewed which included: -1 controlled trial -20 observational studies. 202 articles were reviewed full text and reviewed by 2 investigators. Inclusion criteria: - predictive ability -English-language studies - populations of adults admitted to medical or surgical wards. No power analysis	This is a systematic review therefore not control or intervention groups are included	Outcomes analyzed: -Predictive value of the EWS -Length of stay -Admission to the ICU -Use of the RRT and code team -Nursing -Quality assessment	5 of the 21 studies reported ICU transfers. -2 found an increase in ICU transfers -1 had no difference -2 reported a not significant decrease 4 of the 21 studies reported use of the RRT and code team. - All of the studies found at least a 50% increase in the number of RRT or ICU liaison team calls.
Citation: Sutherasan, Y., Theerawit, P., Suporn, A., Nongnuch, A., Phanachet, P., & Kositchaiwat, C. (2018). The impact of introducing the early warning scoring system and protocol on clinical outcomes in tertiary referral university hospital. *Therapeutics and Clinical Risk Management*, *Volume 14*, 2089–2095. https://doi.org/10.2147/tcrm.s175092					Level IV
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results

"The aim of this study was to evaluate the impact of a hospital protocol in response to patient deterioration in general wards, stratified using the national early warning score (NEWS), on primary patient outcomes of in-hospital mortality and percentage of patients transferred to the intensive care unit (ICU)."	Single-center prospective observational cohort study with a per-protocol control group and a protocol group.	1,145 patients were included in the analysis: 564 patients in the pre-protocol group and 581 in the protocol group. Inclusion criteria: -over 18 years of age -admitted or transferred to the general medical ward from either the emergency department or ICU. No power analysis conducted	Control- 4 month pre-protocol group Intervention: 4 month protocol group Intervention: On admission, vital signs were used to calculate the NEWS. Patients were classified according to the NEWS at admission as being at low risk (score ≤4), moderate risk (scores 5–6), and high risk (score ≥7). Either essential management or ICU transfer was provided to patients based on the hospital protocol.	Outcome: -In-hospital mortality -% of patients transferred to ICU. Secondary outcome: -CPR rate in the general ward -time to ICU transfer. Data were obtained from chart reviews which are reliable. Data obtained using NEWS data collection forms can be unreliable.	ICU transfer: -Higher among high-risk patients in the protocol period compared with those in the pre-protocol period, but this was not statistically significant (17 [40.5%] vs 6 [20.7%], respectively, *P*=0.08) . -Moderate risk, the in-hospital mortality and percentage of ICU transfer in the protocol period were lower than in the pre-protocol period (2.9 vs 15.4%; *P*=0.03; RR 0.19, 95% CI 0.04–0.97, and 8.7 vs 26.9%; *P*=0.02; RR 0.32, 95% CI 0.12–0.87, respectively
Citation: Mestrom, E., De Bie, A., Steeg, M., Driessen, M., Atallah, L., Bezemer, R., Bouwman, R., & Korsten, E. (2019). Implementation of an automated early warning scoring system in a surgical ward: Practical use and effects on patient outcomes. *PLOS ONE, 14*(5), e0213402. https://doi.org/10.1371/journal.pone.0213402					Level IV
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
"The aim of this study was to evaluate the clinical use of an automated modified EWS (MEWS) for patients after surgery."	This study conducted retrospective before-and-after comparative analysis of non-automated and automated MEWS for patients	Sample size: -594 patients Control group- 320 patients Intervention group- 274 patients No power analysis was conducted and	Control: All measured parameters were manually recorded in the EMR. Nurses could manually calculate the MEWS using cards containing the	Primary outcomes: -practical clinical use of the automated EWS system -% of complete MEWS	The adherence to MEWS hospital protocol improved when the automated MEWS system was involved, from 1.1% in the control group to 25.4% in the intervention group.

	admitted to the surgical high-dependency unit in a tertiary hospital	homogeneity of the control and intervention group noted.	MEWS algorithm. Intervention: The electronic EWS system Philips IntelliVue Guardian Solution was implemented. This system facilitated the acquisition of vital signs and the completion of MEWS automated, clinical decision support and awareness to the nursing staff.	-Time interval between assessments Secondary outcomes: -Length of stay -in-hospital and 28-day mortality -ICU readmission rate.	The number of readmitted patients to the ICU and their severity of illness at readmission based on the SAPS II, and APACHE II and–IV did not significantly differ between the control and the intervention group.

Appendix B: NEWS2 Scoring Tool

National Early Warning System Scoring Tool

Date:_____ Shift: AM/PM Patient initials:_____ Room Number:_____

	+3	+2	+1	0	+1	+2	+3
$Sp0_2$ % Scale 1	</=91%	92-93%	94-95%	>/=96%			
$Sp0_2$ % Scale 2 (use this scale if patient has COPD or Hypercapnic Respiratory Failure)	</=83%	84-85%	86-87%	88-92%, >/= 93% on room air	93-94% on oxygen	95-96% on oxygen	>/= 97% on oxygen
Use of Oxygen		Yes		No			
Heart Rate	</=40		41-50	51-90	91-110	111-130	>/=131
Systolic Blood Pressure	</=90	91-100	101-110	111-219			>/=220
Respiratory Rate	</= 8		9-11	12-20		21-24	>/=25
Temperature	</=35.0 (95)		35.1-36.0 (95.1-96.8)	36.1-38.0 (96.9-100.4)	38.1-39.0 (100.5-102.2)		>/=39.1 (102.3)
Level of Consciousness	New-onset confusion, agitation, disorientation, or unresponsive						

	Monitoring	Intervention
0-2 Low	Continuing monitoring per unit policy	No intervention
3-4 Low-Medium	Monitor Vital signs every hour x 1	Make charge nurse aware of patient's score. Call Resource Nurse to evaluate patient.
5-7 Medium	Monitor Vital signs every 30 minutes x 2	Make charge nurse, resource nurse, and provider aware of patient's score and have patient evaluated by resource nurse and provider.
>/= 8 High	Monitor vital signs every 10 minutes x 3	Call a "code rapid response" for urgent evaluation by the critical care team.

(Enter vital signs in blue, for LOC and O2 if positive put + and NEWS2 score in white.)

Time						
SpO2						
Oxygen						
RR						
HR						
SBP						
Temp						
LOC						
Total						

Did this patient have an RRT called for them? Yes/No

Was this patient transferred to a higher level of care? Yes/No