Implementing A Predictive Analytics Tool In An Acute Care Hospital

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Background

With the implementation of electronic medical records, large amounts of data are entered throughout a patient's stay. However, retrieving meaningful information is difficult. Predictive analytics is used to identify early decline in patient status, enabling early intervention. The tool aggregates vital signs, general lab results and more than 50 nursing assessment data items into a Universal Patient Score. The pilot was completed in the fall of 2017 on critical care units by the collaborative effort of the project team. The full implementation was completed on the adult acute care and rehab units in February 2018.
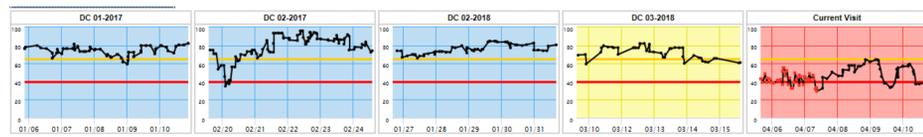
Project Goals

- Reduce sepsis mortality
- Facilitate appropriate assignment of resources
- Increase Rapid Response Team (RRT) calls to support early intervention of the patient's decline in status
- Reduce Code Blue outside Intensive Care

Timeline

- Hardware deployment: September 2017
- Technical Go Live: September 2017
- Initial Education: October 2017
- Go Live for Critical Care: October 30, 2017
- Go Live for Acute Care: January/ February 2018

Clinical Work Group Team Members

- Nursing Informatics Specialist
- Quality Nurse
- Clinical Nurse Specialists
- Staff Nurses
- Nurse Educators
- E-Learning Specialist
- Physician Champion
- PeraHealth Specialists

Education

Phase 1- Critical Care (ICU, IMC, PACU and CICU)

- Mandatory education for all nurses on the pilot units during the October 2017 Competency Marathon.
- Handouts provided: The Rothman Index and its components, Braden Scoring Tool©, and the Clinical Work Flow diagram.
- ❖ Feedback from nurses indicated they did not perceive this education was sufficient to prepare them for go Live; a new strategy was created.

Phase 2- Acute Care and Rehabilitation

- Reconfigured the rollout schedule from "big bang" to a geographic rollout, bringing one floor Live at a time.
- HealthStream module created and assigned to nurses several weeks before roll out.
- One-to-one training one week before scheduled go Live, reviewing specific patients to make learning more meaningful.
- Educated nurses on **SBAR** Script for communication with providers:

> S: "I'm very concerned because Joe Smith, in room 4012, has had a change in mental status and his respiratory rate has increased from 17 to 30. Additionally, his Rothman Index has declined from 60 to 45 over the past four hours."
>
> B: "Patient was admitted with CHF and shortness of breath."
>
> A: "Mr. Smith was alert and oriented x4; however, he is now confused about date and location. His respiratory rate has steadily increased over the past two vital sign checks."
>
> R: "Could you come and assess Mr. Smith?"

- The Clinical Work Group and Physician Champion created a work flow for monitoring and reporting changes in the patient's Rothman Index Score.

PeraHealth Rothman Index Clinical Work Flow
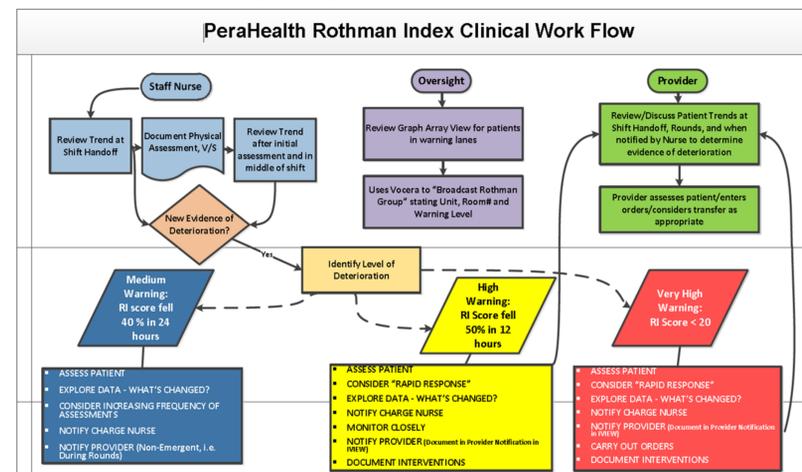
Go Live Support

- Super Users (purple jackets) provided at-the-elbow support 24/7 for five days.
- Vendor support was on-site for two days (day and night shifts).
- Physician Champion rounded with providers.
- Super User Huddle conducted by Nursing Informatics Specialist at 8 am and 8 pm.
- Daily unit rounding by Clinical Work Group leaders.
- Active involvement of Nurse Managers and Assistant Nurse Managers to follow patients' trends.

Post-Implementation

- Action plan initiated for discrepancies in documentation and communication.
- Issues log maintained; weekly updates reported to Steering Committee.
- Post-Live survey indicated one-to-one education was successful in preparing nurses for incorporating the prescribed work flow into their daily routine.
- Encouraged nurses to review historical graphs, monitor trends, and check their documentation for accuracy.

Implications for Practice

- Mitigate "failure to rescue" through early identification of changes , activation of the Rapid Response Team, and communication with providers.
- Highlight the importance of timely, accurate nursing documentation.
- Identify opportunities for palliative care referrals.
- Increase confidence in nursing assessments by validating "gut feelings."
- Confirm appropriate resource allocation (right patient, right bed).
- Support throughput by identifying patients ready for transfer out of the ICU and IMC.
- Executive support is crucial in obtaining buy-in from nursing and medical staff.

Early Outcomes

- Rapid Response Team Calls Increased by 46%
- Transfers to Higher Level of Care Decreased by 11%
- Sepsis Mortality Rate remains below 22%

Next Steps

- Support nurses to identify changes in patient's status
- Use "good catches" and "missed opportunities" to educate nurses and providers on the importance of accurate, timely documentation and communication.
- Implement PeraAnalytics to monitor the impact on project metrics.
- Update mapping when changes are made in nursing documentation.