

NorthBay Health's Adoption of the Rothman Index Results in Decrease in Mortality Rate

HIGHLIGHTS

- During the COVID-19 pandemic, NorthBay Health replaced MEWS with the Rothman® Index to improve overall clinical surveillance.
- Post adoption, there was a 16% decrease in observed mortality rate and 30% decrease in unplanned transfers to the ICU, resulting in financial savings from prevented, avoidable ICU days.



NorthBay Health is a locally based, independent, nonprofit healthcare organization in Solano County, California. The health system includes two hospitals: NorthBay Health Medical Center in Fairfield (home to Travis Air Force Base) and NorthBay Health VacaValley Hospital in Vacaville; a 100-provider primary and specialty care medical group; the NorthBay Cancer Center, and several advanced keynote services, including heart and vascular, neuroscience and spine and orthopedics.

The 154-bed NorthBay Medical Center is Solano County's most comprehensive hospital. Services include a Level II Trauma Center, maternity care and a neonatal intensive care unit. It is also the only civilian hospital in the county capable of performing open heart surgery. NorthBay VacaValley Hospital in Vacaville offers 24-hour emergency care, oncology care and diagnostic services.

CHALLENGES:

While it is surrounded by corporate giants such as Kaiser Permanente and Sutter Health, local families and individuals of all ages rely on NorthBay to receive high quality healthcare services close to home. The system serves a large proportion of high-acuity, under-insured and uninsured patients and seeks to provide top-notch care to all residents. NorthBay's vision and strategic initiatives include four pillars: focus on people, quality, cost and convenience.

"Our patients don't do a lot of proactive health; it's more reactive medicine, so we're seeing people when they're really sick," said Seth Kaufman, MD, Chief Medical Officer and Chief Quality Officer. "Then, COVID turned things upside down. It's even more important now from a business standpoint that we are aggressive in evaluating patients early when they're decompensating to keep them out of the ICU."

NorthBay had been using a Modified Early Warning System (MEWS) as part of their process to transfer deteriorating patients into their ICU, however "it was not real-time and was not working well," said Natalie Correll-Yoder, MN, CCRN, CCNS, Clinical Nurse Specialist/ Clinical Practice Manager. Aside from the need to better identify deteriorating patients, the system was challenged with sepsis mortality, maintaining ICU staffing, and enhancing palliative care services.

SOLUTION:

Correll-Yoder introduced the Rothman Index (RI) to NorthBay Health's leadership after learning about it at the American Association of Critical Care Nurses (AACN) national conference. Using a shared decision model, she gathered feedback about current challenges and requirements for a new system from frontline staff and a leadership workgroup that included Dr. Kaufman and representatives from the quality and information technology teams.

Ultimately, NorthBay decided to implement Rothman Index (RI) TREND, impressed by the solution's unique and powerful approach to accurately recognizing the physiological status of patients. Correll-Yoder shared that "a deciding factor for us was the fact that the RI captures subtle changes in patient condition since it includes nursing assessments. We expected that this would set the RI apart from the vitals-based algorithm we were using. We were also intrigued with the outcomes that other customers had achieved with RI TREND." Correll-Yoder was alluding to fact that other hospitals have used the Rothman Index to impact mortality, readmissions, ICU bouncebacks, and unplanned transfers, to name a few.

When implementation began NorthBay expected some challenges given it was during the COVID-19 pandemic, however Mother Nature had even more difficulties in store -- historic wildfires disrupted health system operations and dramatically impacted the surrounding patient population. Despite these challenges, the NorthBay team persevered and proceeded with a phased rollout, unit-by-unit, with the ICU nurse rounders serving as the core team of superusers. The clinical team incorporated the RI into their workflows (i.e., daily safety huddles), with specific use cases to recognize deteriorating patients to help prioritize the sickest patients for proactive rounding, enhance the discharge readiness process and improve their communication through a common language, supporting the objective view of each and every patient.

Heather Resseger, MSN, RN, CNL, CPHQ, Chief Nursing Officer, said, "We are a Magnet facility that emphasizes education and evidence-based practice and research. It resonates with our culture for our staff to be able to speak the same language using the RI to highlight when we need to do something to prevent an event."

NorthBay nurses respond to all RI alerts and look at RI TREND when doing full body patient assessments; ICU rounders check the RI score and trendlines throughout every shift; clinical managers report out on RI warnings during the daily organization-wide safety call, which includes all executives and managers. Changes in patient condition are identified, communicated among the team, and addressed quickly and efficiently.

RI is also integral as part of the chart review process and used to better analyze hospital metrics. "I do all the code blue analyses, and 70% to 80% of the time, the RI is already trending and had identified the patients before they coded," said Correll-Yoder. "We had a nice decline in the rate of unplanned transfers to the ICU after our RI implementation -- we are making a difference!"

SUMMARY:

Outcomes attributed, in part, to the Rothman Index utilization include:

- Improved frequency and identification of patients at risk in safety huddles
- Overall improvement in team communication using the RI as "common language"
- 16% decrease in observed mortality rate, excluding Covid patients (Figure 1)
- 30% decrease in unplanned transfers to the ICU resulting in financial savings from prevented, avoidable ICU days (Figure 2)

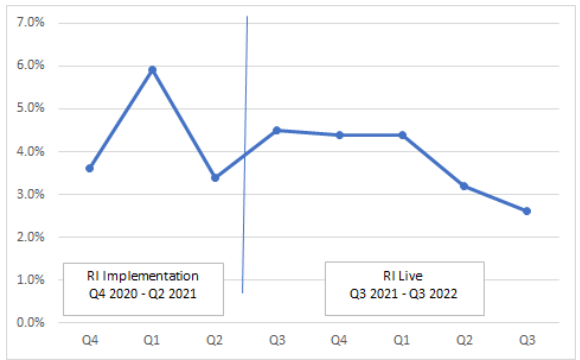


Figure 1 - Observed Mortality Rate

Utilization of the Rothman Index has also proven invaluable as a safety net, especially during a time of staff shortages with many novice nurses on the floors. In one instance, a patient with a chronic cardiac condition began to show signs of deterioration, triggering a medium level warning. The rounder and the staff nurse quickly used the information brought forward by the RI TREND warning in communication with the physician, resulting in successful intervention for the patient and a few days later, discharge.

Looking forward, NorthBay Health hopes to add RI MOBILE, which enables clinicians to identify at-risk patients with alerts and data coming directly to their mobile devices while moving throughout the hospital. Also, the Palliative Care and Case Management teams are beginning to incorporate the Rothman Index into their workflow as they continue their phased rollout.

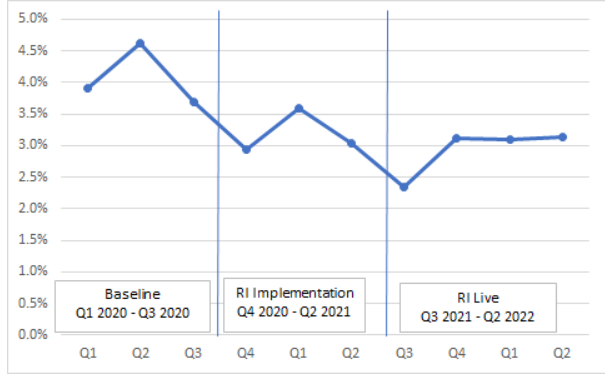


Figure 2 - Unplanned Transfer Rate