Yale NewHaven Health
Bridgeport Hospital

A multidisciplinary approach to identifying and managing very ill patients improves sepsis survival and overall survival while reducing cost

S. Hoq MD, R. O'Connell MD, M. Misra MD, J. O'Neil RN, S. Gazi MD, S. Afrin MD, J. Palumbo MBA, Bridgeport Hospital, Bridgeport CT.
Yale-New Haven Health

Summary

Objectives:

1. Early detection and reduced variation in management of deteriorating patients on the medical floor through electronic medical record tool
2. Reduce overuse of Intensive Care Unit (ICU) resources
3. To create a Hospitalist lead team approach to manage deteriorating patients in a Progressive Care Unit (PCU)

Background:

Daily hospital-wide safety huddles identified delays and variation in the management of critically ill patients on medical/surgical units were occurring too often. Delays and variation in management of these patients may cause:

- Increase mortality
- Increased cost
- Increased length of stay
- Lower patient satisfaction

Multidisciplinary groups determined it was not possible to transfer all deteriorating patients to the ICU and building a new ICU was not practical for multiple reasons. Early detection and 'Right Patient, Right Bed, Right Time' is essential to improve the quality of care.

Methodology:

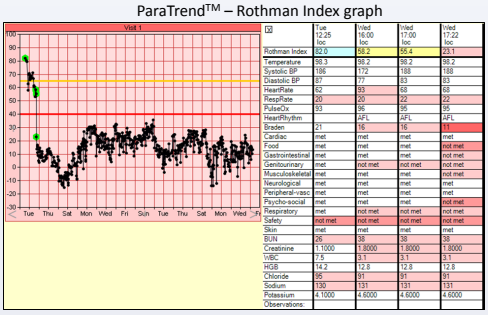
A clinical redesign comprised of a multidisciplinary team was created to manage the implementation of:

- Early surveillance
- Rothman Index (RI) – uses a 26 variable model to measure patients condition
- PCU & ICU admission criteria
- PCU is a closed unit with Hospitalist Leadership

Initial phases of this initiative began July 2015 and was at full capacity of a 16 bed PCU on December 14, 2016.

Project Description

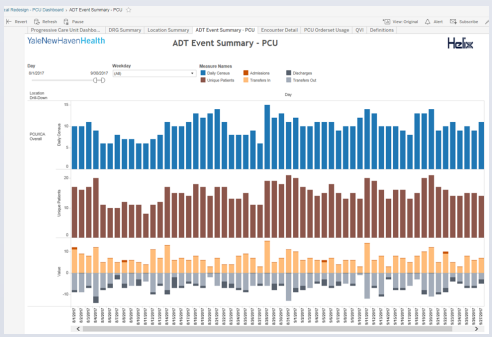
ParaTrend™ – Rothman Index graph

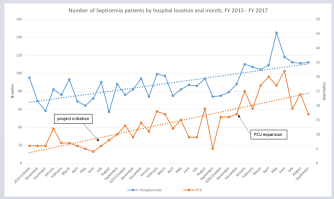


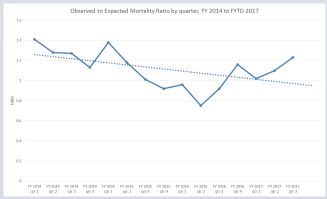
	Tue 12:25 tec	Wed 16:00 tec	Wed 17:00 tec	Wed 17:22 tec
Rothman Index	82.0	86.2	86.4	83.1
Temperature	98.3	98.2	98.2	98.2
Systolic BP	186	172	188	188
Diastolic BP	87	77	83	83
HeartRate	92	93	93	93
RespRate	20	20	22	22
PulseOx	93	96	95	95
HeartRhythm		AFL	AFL	AFL
Braden	21	15	15	15
Cardiac	met	met	met	met
Food	met	met	met	not met
Gastrointestinal	met	met	met	not met
Genitourinary	met	not met	not met	not met
Musculoskeletal	met	met	met	not met
Neurological	met	met	met	met
Peripheral-vasc	met	met	met	met
Psycho-social	met	met	met	not met
Respiratory	met	not met	not met	not met
Safety	not met	not met	not met	not met
Skin	met	met	met	met
BUN	26	30	30	30
Creatinine	1.1000	1.8000	1.8000	1.8000
WBC	7.5	9.1	9.1	9.1
HGB	14.2	12.8	12.8	12.8
Chloride	95	91	91	91
Sodium	130	131	131	131
Potassium	4.1000	4.6000	4.6000	4.6000
Observations:				

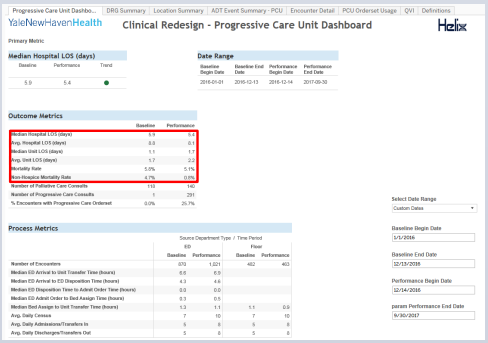
Results

As of December 14, 2016, 1,021 patients were transferred into the PCU of which 237 (23%) were septicemia patients which has been increasing month over month. Patients who transferred to the PCU have an average PCU LOS of 2.2 days which has impacted and improved total hospital LOS from an average of 5.9 to 5.4 days. Direct cost per case initially decreased, resulting in a roll-up saving of ~$200 per case. Hospital mortality rate has also improved from 5.8% to 5.1% with a non-Hospice mortality rate improvement from 4.7% to 0.8%. The observed to expected mortality ratio has also improved since FY 2014.









Lessons Learned

Discussion

- Although average daily census may be between 10 to 15 patients, there may be upwards of 20 unique patients daily as patients frequently are transferred in and out of the PCU
- A very low percentage of patients are directly admitted to the PCU with a slightly higher percentage discharged directly home
- The unit's low LOS allows more patients to receive higher level of care before deteriorating further causing longer LOS or suboptimal outcomes. Since this initiative began average and median hospital-wide LOS has decreased
- Managing patients care in the appropriate level of care impacted a total hospital LOS savings of 0.5 days
- 'Right-patient, right-bed, right-time, allows the appropriate level of care to be provided and has improved overall hospital mortality rate from 5.8% to 5.1% and has improved PCU non-hospice mortality rate from 4.7% to 0.8%

Implications

This initiative highlights that it is possible to provide better care at lower cost. Some components of this initiative can be replicated elsewhere to address the variation in the management of deteriorating patients. Having a Hospitalist led and staffed unit allows better control of patient flow of the care provided by decreasing variation in the management of deteriorating patients.