

Authors: Principal Investigator/ Rutgers Chair: Mary Stachowiak, DNP, RN, CNL
 Co-Principal Investigator: Christine Salmon, BS, BSN, RN, CCRN, DNP student
 Team Members: Anne Sutherland, MD LaVern Allen, MSN, MBA

Introduction/ Significance

Mechanical ventilation is a life-saving intervention that is associated with a high mortality rate and potential complications including:

- Pneumonia
- Acute respiratory distress syndrome
- Delirium
- ICU-acquired weakness

Reducing the duration of mechanical ventilation and the length of time spent in the ICU have been shown to improve outcomes. The Society of Critical Care Medicine recommends a daily protocolized assessment process to reduce ventilator days.

AIM: Improve completion of paired Spontaneous Awakening Trials (SATs) and Spontaneous Breathing Trials (SBTs) with the “Wake Up and Breathe Protocol” (top right) and therefore reduce mechanical ventilator days and ICU length of stay.



Methodology

Design:

Quality Improvement project with pre- and post-intervention retrospective chart reviews.

Setting & Population:

All adult mechanically ventilated patients in the Medical ICU of a large, urban, Level I Trauma, Academic hospital

Measures:

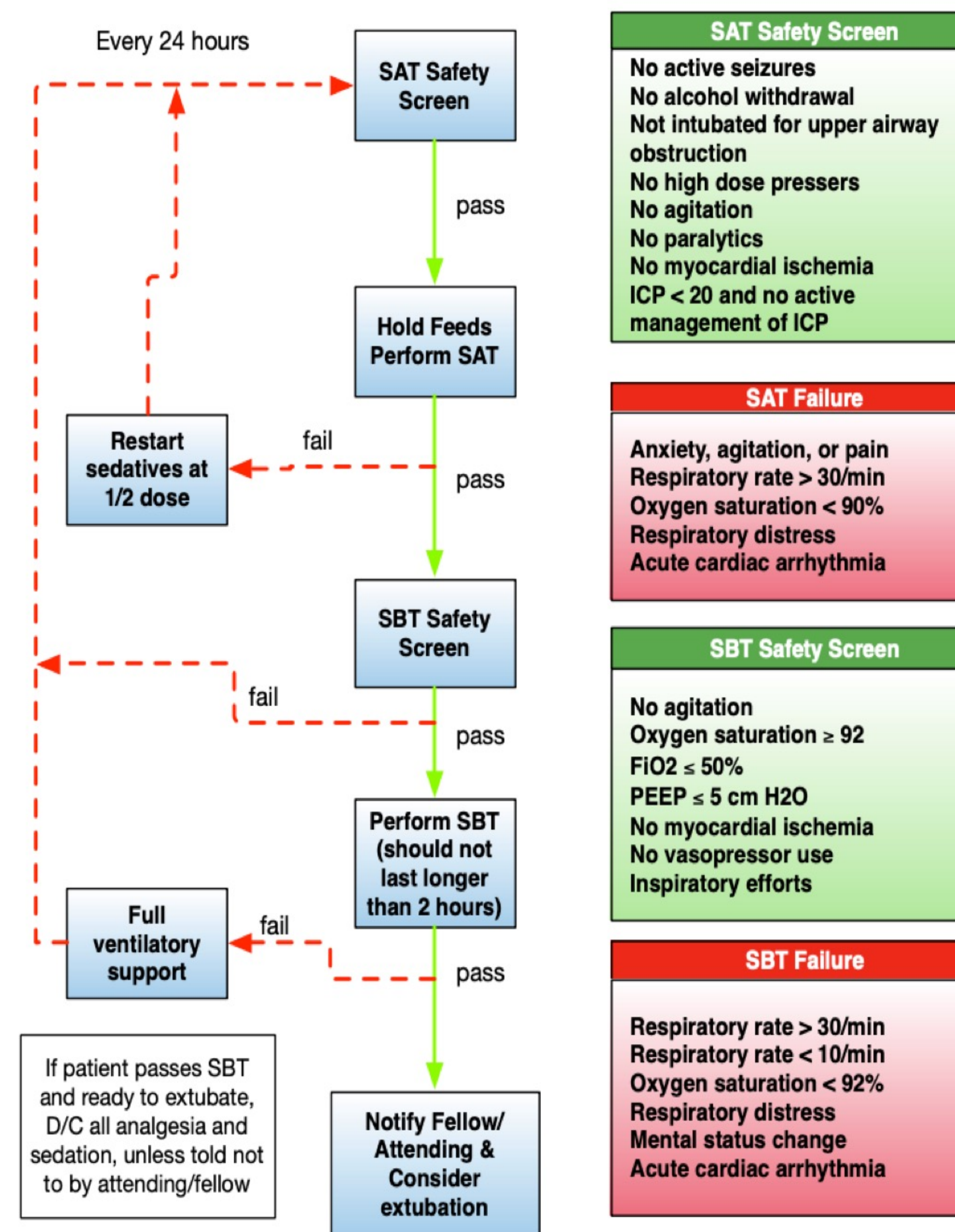
All staff were educated on the new procedure, documentation in the EHR, morning Weaning Huddles and a communication board (above).

Analysis:

Retrospective data was collected into a REDCap Database for 8 weeks prior to intervention and 8 weeks after intervention and analyzed with Microsoft Excel

- Demographic data (age, gender, diagnosis, reason for intubation)
- Documentation of an SAT and SBT
- SOFA score, ICU length of stay, Ventilator days
- Documentation of unplanned extubation or plan for palliative extubation
- If the patient met criteria for extubation
- If the patient was extubated or required re-intubation within 24 hours

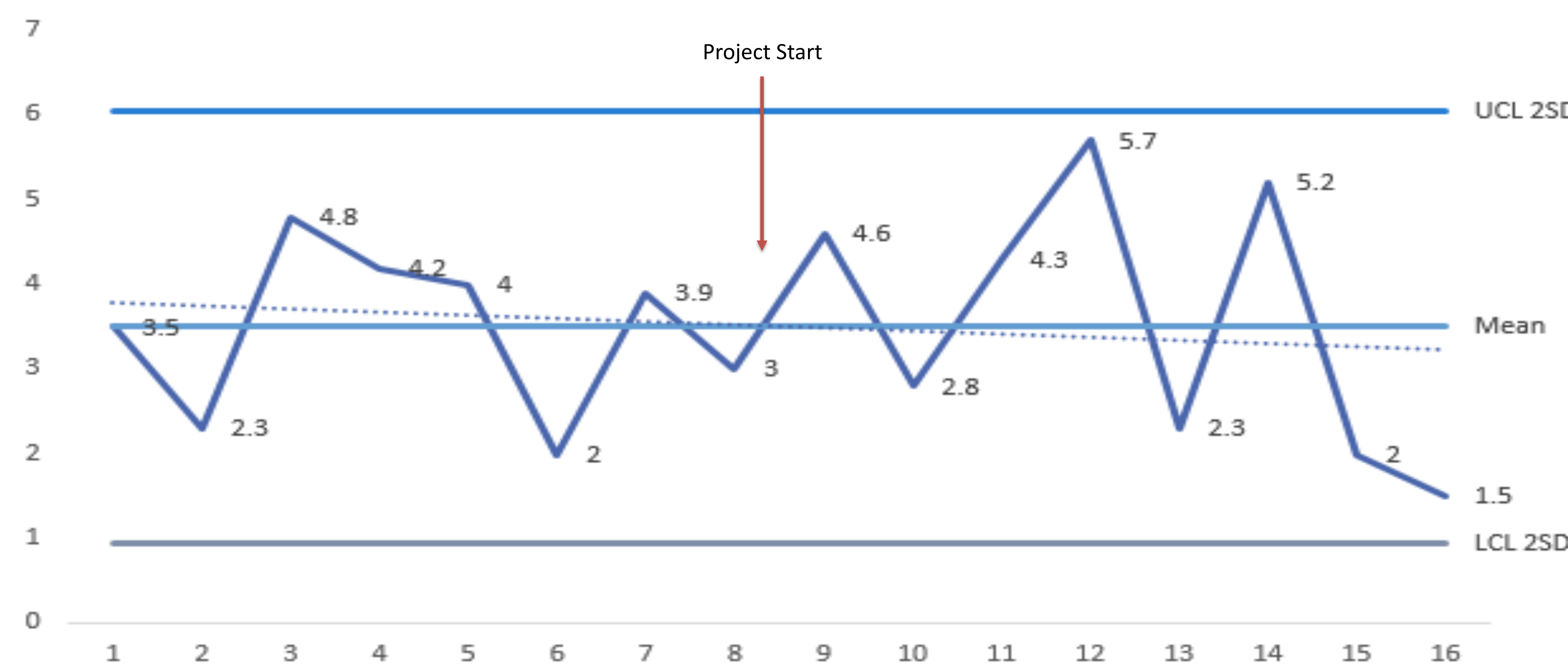
Wake Up and Breathe Protocol



A. Sutherland, 2/16

Results

Ventilator Days per Week



Contact Information: Christine Salmon BS, BSN, RN, CCRN, DNP student - 732-742-7079
walczaca@sn.rutgers.edu CSalmon112@icloud.com

Discussion

The intervention did not reduce ventilator days and ICU length of stay in aggregate. A control chart for ventilator days (bottom left) demonstrated a downward trend with a special cause variation in the post implementation period.

Secondary analysis demonstrated a reduction in ventilator days per diagnosis group when adjusted to SOFA score for patients with all diagnoses except the “Other” category (below).

There were several other positive impacts:

- Significantly improved documentation of SATs, SBTs, and paired SAT/ SBTs
- Improved multidisciplinary teamwork
- More efficient process of evaluating patients for weaning from mechanical ventilation
- Closed evidence practice gap

Ventilator Days per SOFA Score

	Pre	Post	Pre/ Post Percent Change
SOFA < 9	0.67	0.8	+19.4%
SOFA ≥ 9	0.26	0.26	0%
Altered Mental Status	0.76	0.43	-43.4%
Stroke	1.26	0.66	-47.6%
Liver Disease	0.28	0.25	-10.7%
Respiratory Failure	0.75	0.63	-16.0%
Seizure	0.48	0.26	-45.8%
SARS-CoV-2	0.83	0.5	-39.8%
Sepsis	0.24	0.06	-75.0%
Other	0.23	0.52	+126.1%

Conclusions

The project was limited by a short (16 week) evaluation period, a sample population from one ICU, and the SARS-CoV-2 pandemic which altered many processes and did not allow for equal comparison of pre- and post-intervention periods

Future study could evaluate for seasonal variations in patient population and the effects of census, acuity, and staffing ratios on these outcomes.

Other outcomes that could be evaluated for changes as a result of this project include incidence of delirium, tracheostomy rates, and amount of sedative drugs utilized.

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