Collaboration and Coordination in the MRICU:

An Interprofessional Approach to Implementation of a Daily Review of Sedation Strategy, Liberation Potential and Mobility Plan

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Medical Respiratory Intensive Care Unit
VCU Health

28 bed ICU

Two service teams (Red/Blue) that are similar in design admit patients to the service on a rotating basis

Established Interdisciplinary Team

- Nursing
- Medicine (Attending, Fellow, Resident, Intern)
- Advanced Practice Provider
- Physical Therapy
- Occupational Therapy
- Pharmacy
- Respiratory Therapy

VCU Langston Quality Scholars Program

Experiential learning program designed to deliver continuing professional development focused on the science of improvement and leadership skills.

- Teams of physician-nurse dyads (may add other discipline to team)
- Didactic and online modules, embedded leading of a QI experience in the workplace, with improvement coach/advisor
  - Curriculum designed in collaboration by team of education experts in assessment and evaluation, health administration, medicine, nursing, and science of improvement professionals
  - 43.75 CME or CEUs (8 evenings, 1 full day, 12 on-line modules)
  - Less than 1 year in duration
- Content:
  - Science of improvement methods & tools, leadership and theory
  - Coaching by a healthcare science of improvement expert biweekly
  - *Note: Support for analysis & data visualization provided by health system data analysts/experts*

Implementing the ABCDEF Bundles in Adult ICUs

ASSESS, PREVENT & MANAGE PAIN

BOTH SAT & SBT

CHOICE OF ANALGESIA AND SEDATION

DELIRIUM: ASSESS PREVENT AND MANAGE

EARLY MOBILITY AND EXERCISE

FAMILY ENGAGEMENT AND EMPOWERMENT

Reference: SCCM: ICULIBERATION.ORG

BOTH SAT & SBT

- **Both Spontaneous Awakening Trials (SAT) and Spontaneous Breathing Trials (SBT), focuses on setting a time(s) each day to stop sedative medications, orient the patient, assess awakefulness, and conduct an SBT in an effort to liberate the patient from the ventilator.**

- ***Synergistic use of SAT/SBT has shown in studies to decrease mechanical ventilation days, hospital lengths of stay and delirium.***

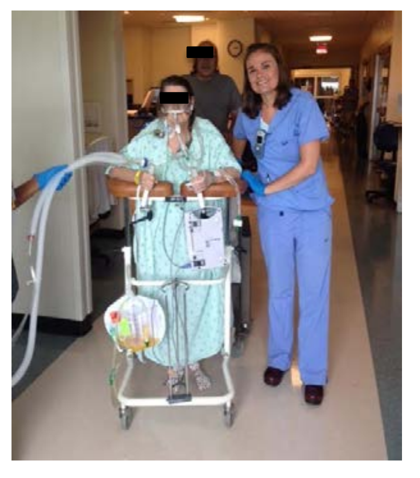
CHOICE OF ANALGESIA AND SEDATION

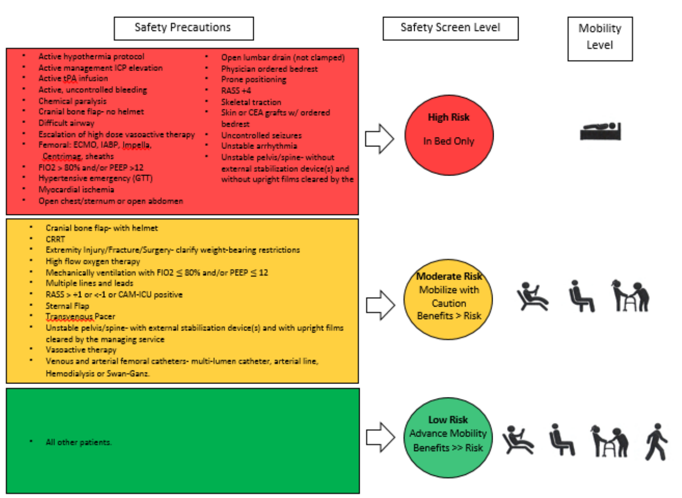
- **ICU sedation can reduce anxiety and agitation for patients, facilitate mechanical ventilation, and decrease traumatic memories.**
- **However, deep sedation has been found to reduce six-month survival and increase hospital mortality, ICU lengths of stay, ventilator duration and physiologic stress.**
- **Evidenced based guidelines for sedation: Pain, Agitation and Delirium (SCCM 2013)**

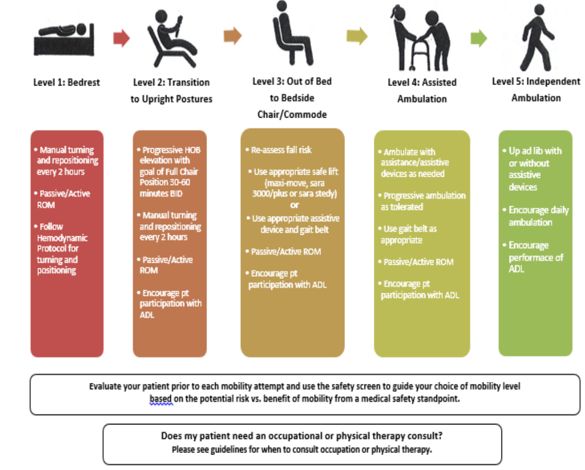
CHOICE OF ANALGESIA AND SEDATION

The Richmond Agitation–Sedation Scale (RASS) 2002		
Score	**Term**	**Description**
+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient–ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	Spontaneously pays attention to caregiver
-1	Drowsy	Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice
-2	Light sedation	Briefly (less than 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

EARLY MOBILITY AND EXERCISE







- ICU-acquired weakness –*Impairs ventilator weaning and functional mobility*
  Patients with ICU-acquired weakness require approximately 20 *additional ventilator days and have increased mortality*
- **Goal to identifying strategies for successful implementation of early mobilization programs**
- **Safety screens prior to mobilizing patients**
- **Mobility plan should be discussed every day during interdiscliplinary rounds**

Identifying The Problem

Building The Team

MD- Attending

MD- Fellow

Nurse Practitioner

RN- Clinical Coordinator

RN- Bedside

Physical Therapist

Occupational Therapist

Respiratory Therapist

Pharmacist

The Aim

By October 2016, achieve daily **interprofessional communication and coordination** of care relevant to patient **sedation level**, **liberation potential** and **mobility plan** for all MRICU Blue team CCH4 intubated or trached patients as evidenced by increased compliance with SAT/SBT, adherence to RASS goal, and discussion and implementation of a daily mobility plan.

Daily Interprofessional Huddle
8 am M-F

Scripted;
2 min or less per patient

Plan

Do

Act

Study

Small tests of change

Discussed plan of care for Sedation, Liberation potential and Mobility

The Solution

MRICU Coordination & Collaboration

Date: ______ Pt Initials: ______ Room: ______

DX:

AIRWAY: ETT Trach HFNC NC RA

DIFFICULT AIRWAY? YES NO N/A

RASS GOAL: ______ Current RASS: ______ Chemically Paralyzed? Yes/No

Follows simple commands? Y N

Sedation gtts: None/Propofol/Fentanyl/Dilaudid/Versed/Precedex/other______

SAT Screen: Passed Failed N/A

SAT: Passed Failed Ongoing N/A

CAM ICU + –

SBT Screen: Passed Failed N/A

SBT: Passed Failed Ongoing N/A

CRRT Yes/No HD Su M Tu W Th F Sa Restraints Yes/No

VASOACTIVE gtts: None/ Levophed/Vasopressin/Dopamine/Dobutamine

Other/Notes:

Baseline mobility- independent/ ambulatory assist device bed bound

Current MOBILITY plan: Y N

Caution/notes:

Travel/Procedures: Y N Maybe ______

Ongoing discussion for goals of care? Y N

Today's Interprofessional Coordinated PLAN:

Extubation Potential: ☐ ______

Sedation: ☐ ______

Mobility: ☐ ______

1 2 3 4 5

☐ Attending ☐ Fellow ☐ NP/ PA ☐ RN ☐ EP ☐ RT ☐ PT ☐ OT ☐ Pharm D

Bundle Huddle

July 12 - October 31, 2016

53 patients

269 Huddles

Drill Down Data Includes:

- 14 patients
- 50 Huddles

Outcomes of Bundle Huddle

1. Increased time at Richmond Agitation Sedation Scale (RASS) goal
2. Decreased benzodiazepine use
3. Increased compliance with Spontaneous Awakening Trial (SAT)
4. Increased compliance with Spontaneous Breathing Trial (SBT)
5. 99% of all patients had a mobility plan

Average Observed Inpatient Length of Stay for MRICU Admissions by Team

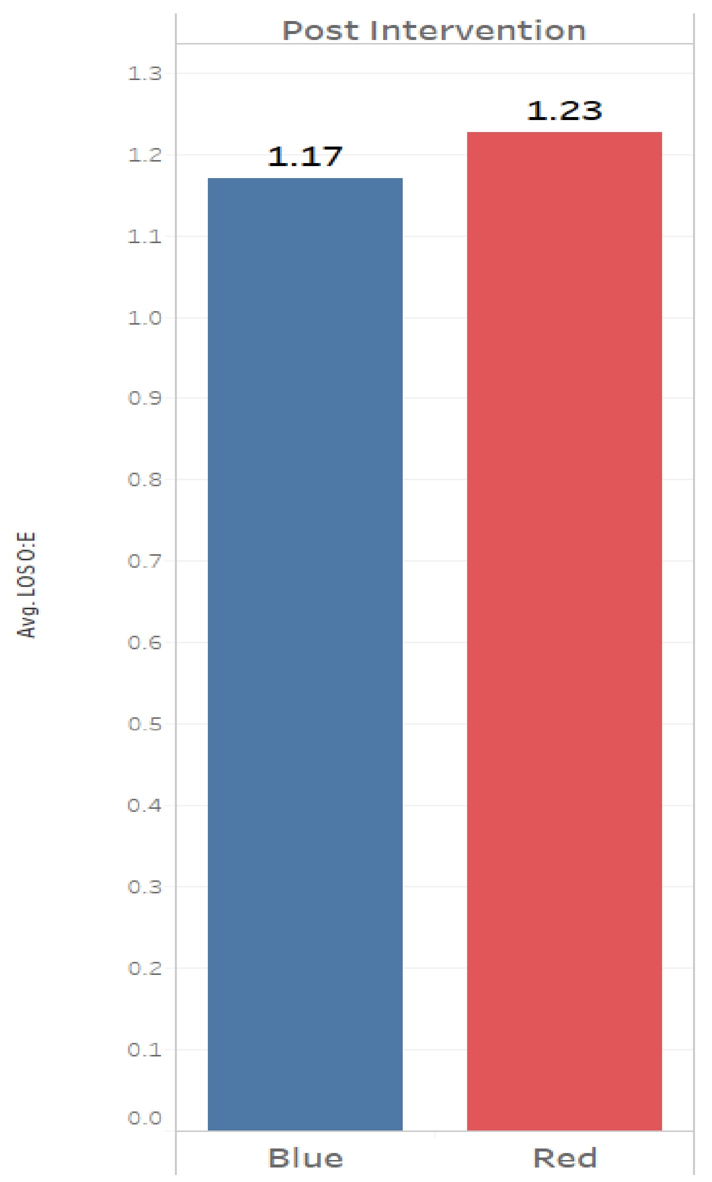
Pre-intervention
Post Intervention

Avg. Observed LOS

11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00

	Pre-intervention		Post Intervention	
	Blue	Red	Blue	Red
Avg. Observed LOS	11.01	9.95	7.75	9.22

Observed: Expected Inpatient Length of Stay by DRG for MRICU Admissions by Team



Average ICU Days for MRICU Admissions by Team

Pre-intervention

Post Intervention

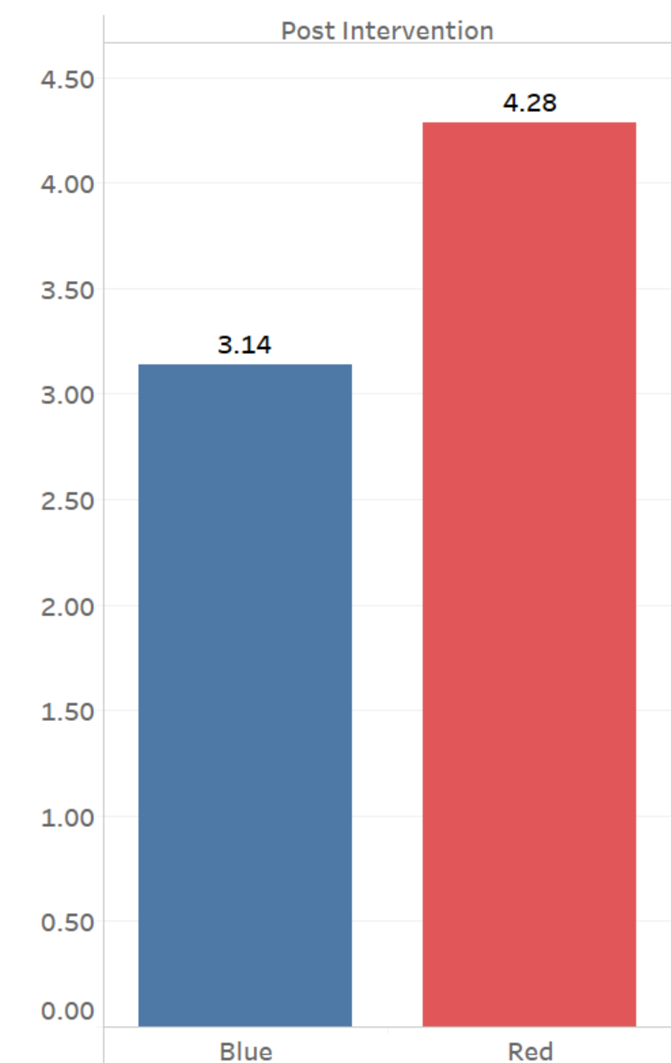
Avg. ICU Days

5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00

4.96
3.76
3.14
4.28

Blue
Red
Blue
Red

Average ICU Days for MRICU Admissions by Team



LOS difference	1.14 days
Blue team admissions	183
ICU days saved during intervention	208.62
Average cost of ICU day	$3184 *(Dasta, McLaughlin, Mody, Piech 2005)
Total cost savings of intervention	$664,246
Annual expected LOS difference between teams	711.64 days
Potential Yearly Savings	**$2.26 Million**

Desta, McLaughlin, Mody, Piech (2005). Daily cost of an intensive care unit day: the contribution of mechanical ventilation. *Critical Care Medicine,* 33(6), 1226-71

Average MRICU Accommodation Charges Per Admission

	Non-intervention		Intervention	
Before	N= 62	$28,312	N= 65	$31,330
After	N= 184	$33,316	N= 244	$29,019

Average Respiratory Therapy Charges Per Admission

	Non-intervention		Intervention	
Before	N= 62	$5,748	N= 65	$13,946
After	N= 184	$12,736	N= 244	$12,191

LQS PROGRAM -10 Months	
Faculty (including fringe benefits)	$ 49,500
Center Staff	$ 13,500
Coach	$ 18,094
CME Credits	$ 2,520
DiSC (26)	$ 1,280
Student Access IHI Online (50)	$ 3,600
Food	$ 1,500
Outside Speakers	$ 5,000
Educational Supplies (notebooks/pens etc)	$ 500
Speakers Travel (1 night hotel & flight)	$ 2,000
8 teams/16 scholars	$97,494
Price Per Dyad	$12,187

Estimated Cost Per Huddle 20 mins/ huddle	
Attending	$ 21.15
Fellow	$ 6.51
Nurse Practitioner	$ 16.83
RN- Clinical Coordinator	$ 11.87
RN- Bedside	$ 9.15
Physical Therapy	$ 14.12
Occupational Therapy	$ 14.12
Respiratory Therapy	$ 8.40
Pharmacist	$ 18.35
Huddle Total Cost- Full Attendance	$ 120.50

Value = (Outcomes + Quality)/Cost

Outcomes

- Decreased Length Of Stay
- Patient Centered Outcomes (anecdotal evidence of improved patient/family satisfaction)
- Decreased Health Care Cost/Charges

Quality

- Staff Satisfaction
- Interprofessional Collaboration
- Improved Communication
- Science of Improvement Skills and Knowledge

Cost

- Cost Program
- Cost of Huddle Time

Conclusions:

- Our project makes a Case for High Value Continuing Professional Development
- The Langston Center provided the tools for a successful QI project
- When programs similar to The Langston Quality Scholars are implemented, this strategy can reduce health care costs and can be a successful return on investment

References

1. Balas et al. Critical Care Nurses' Role in Implementing the "ABCDE Bundle" into Practice. Critical Care Nurse 2012 Apr; 32(2): 35-48.

2. Barr et al. American College of Critical Care Medicine. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Critical Care Medicine 2013 Jan; 41(1):263-306.

3. Desta et al. Daily cost of an intensive care unit day: the contribution of mechanical ventilation. Critical Care Medicine 2005; 33(6): 1226-71.

4. Ely, E. Wesley MD. The ABCDEF Bundle: Science and Philosophy of How ICU Liberation Serves Patients and Families. Critical Care Medicine 2017 Feb; 45(2): 321-30.

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