Getting to zero: VAP Wake Up and Breathe

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Session Overview: VAP

- Wake up and Breathe---'A' of the ABCDE bundle for critically ill patients
- Sedation guidelines development and implementation
- Spontaneous Awakening Trials

4 E's: Implementation Framework

	Frontline Staff	Team Leaders	Senior Executives
Engage	Ask, *how does this make the world a better place?* – Help staff understand the preventable harm – Share stories about patients affected – Estimate number of patients harmed – Develop a business case		
Educate	What do I need to do? – Convert evidence into behaviors; – evaluate awareness and agreement		
Execute	How can I do it? – Listen to resisters – Standardize, create independent checks – Make it easy to do the right thing – Learn from mistakes		
Evaluate	How do I know we made a difference? – Define measures – Regularly assess measures		

Engage:
The Critical Care Bundle: ABCDE

Three principles:

1. Improving communication among members of the ICU team
2. Standardizing care processes
3. Breaking the cycle of over sedation and prolonged mechanical ventilation which can lead to delirium and muscle weakness

Engage:
The Problem

- In the United States, 55,000 patients are cared for daily in 6000 ICUs.
- The most common reason for admission is respiratory failure and the need for mechanical ventilator.
- The vast majority of patients on ventilators require sedation
- 60-80% of ventilated patients develop delirium at some point during their hospital course

Ely EW et al. Delirium as a predictor of mortality in mechanically ventilated patients in the ICU. JAMA 2004; 291: 1753-62

Engage:

Quote from husband of 32 year old sepsis survivor

"Doctor, she's not all there. The wit, the comprehension, the concentration. It's all haphazard at best. To most, it is unrecognizable. The best way to describe it is mental disorganization, like there is a connection missing or a synapse not firing. It has been 10 months, and I just keep waiting for it to straighten itself out. Is this it?"

(Engagement)

Approach to Reducing VAP

as well as optimizing overall patient outcomes

As simple as "ABCDE"

A Awakening trial-daily

B Breathing trial-daily

C Coordinating A and B

D Delirium management: non-pharmacological and pharmacological

E Exercise—progressive mobility

Review the Evidence: ABC Trial – Objectives

- To determine the efficacy and safety of a protocol combining daily interruption of sedatives and spontaneous breathing trials (SBTs)
  - Ventilator-free days
  - ICU and hospital length of stay
  - Survival
  - Duration of coma and delirium
  - Long-term neuropsychological outcomes

THE LANCET

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Articles

Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled trial): a randomised controlled trial

Timothy D Girard, John P Kress, Barry D Fuchs, Jason W W Thomason, William D Schweickert, Brenda T Pun, Darren B Taichman, Jan G Dunn, Anne S Pohlman, Paul A Kinniry, James C Jackson, Angelo E Canonico, Richard W Light, Ayumi K Shintani, Jennifer L Thompson, Sharon M Gordon, Jesse B Hall, Robert S Dittus, Gordon R Bernard, E Wesley Ely

Lancet 2008; 371: 126–34

See Comment page 95

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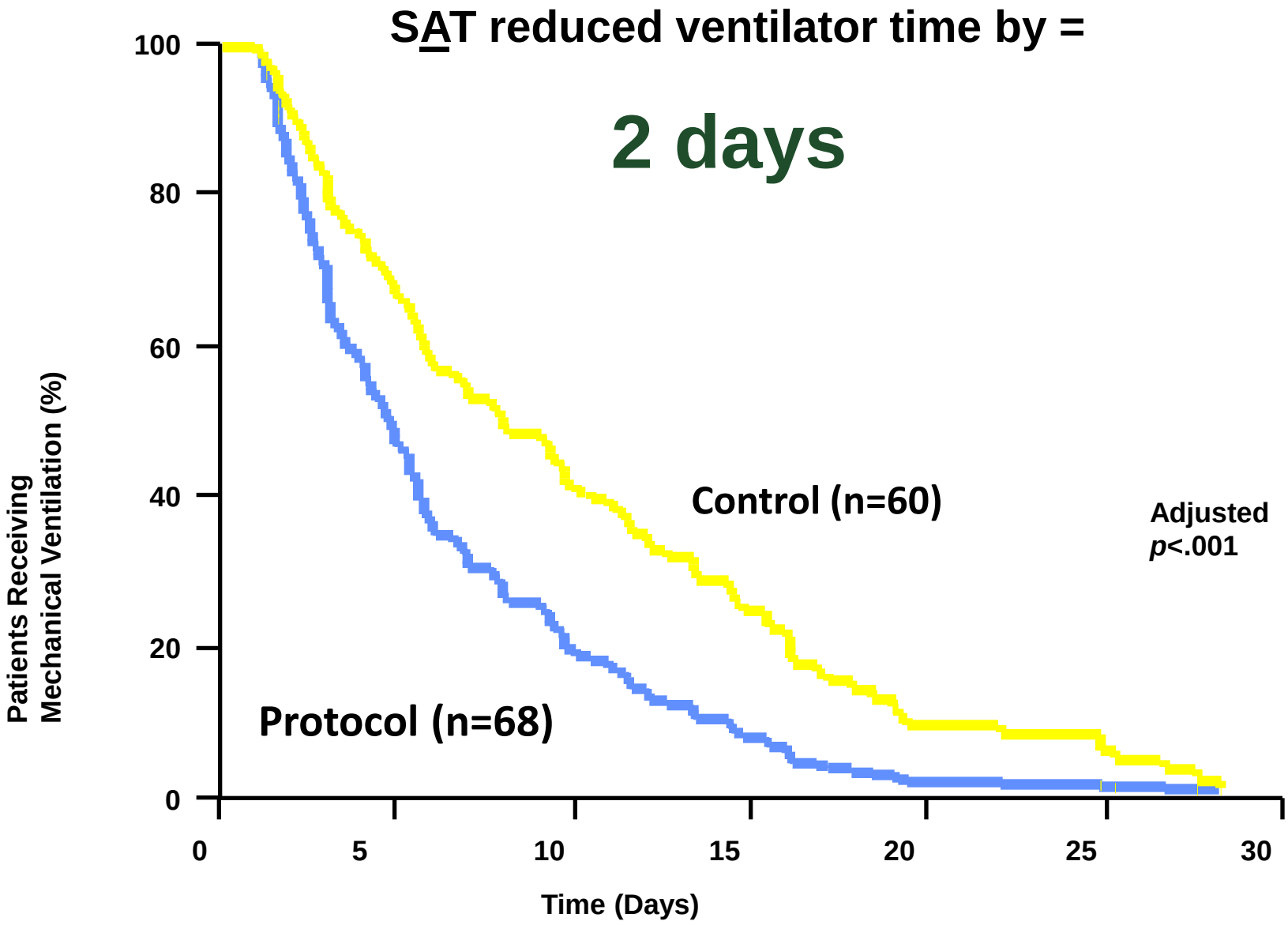
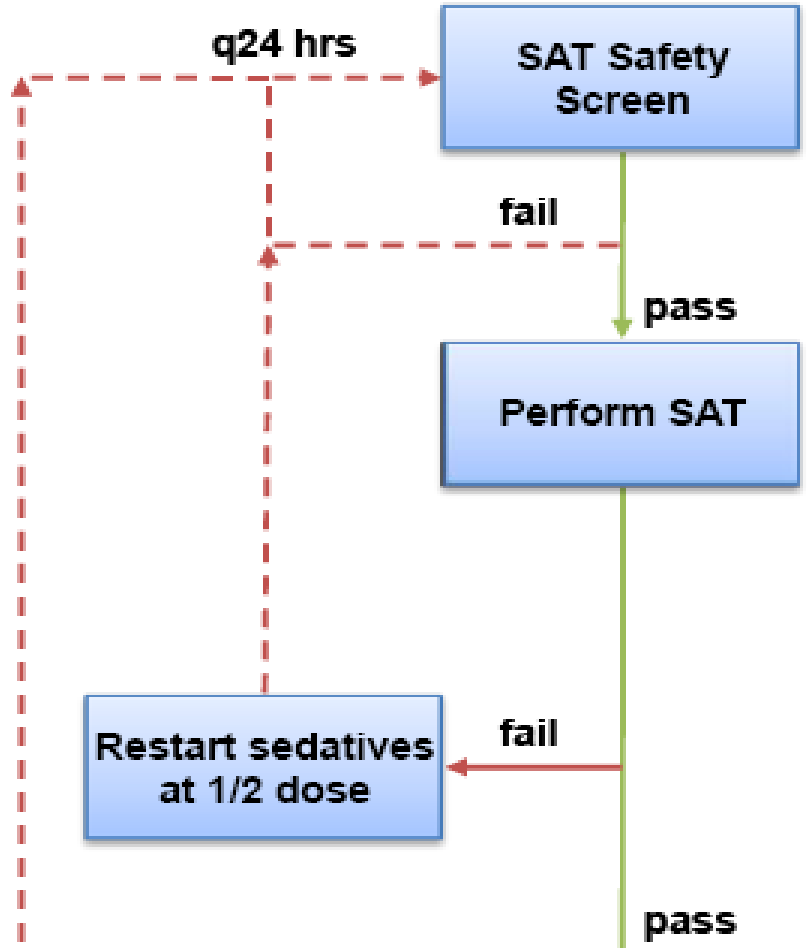
Daily Interruption of Sedatives



Kress JP, et al. N Engl J Med 2000;342:1471-7

Spontaneous Awakening Trial



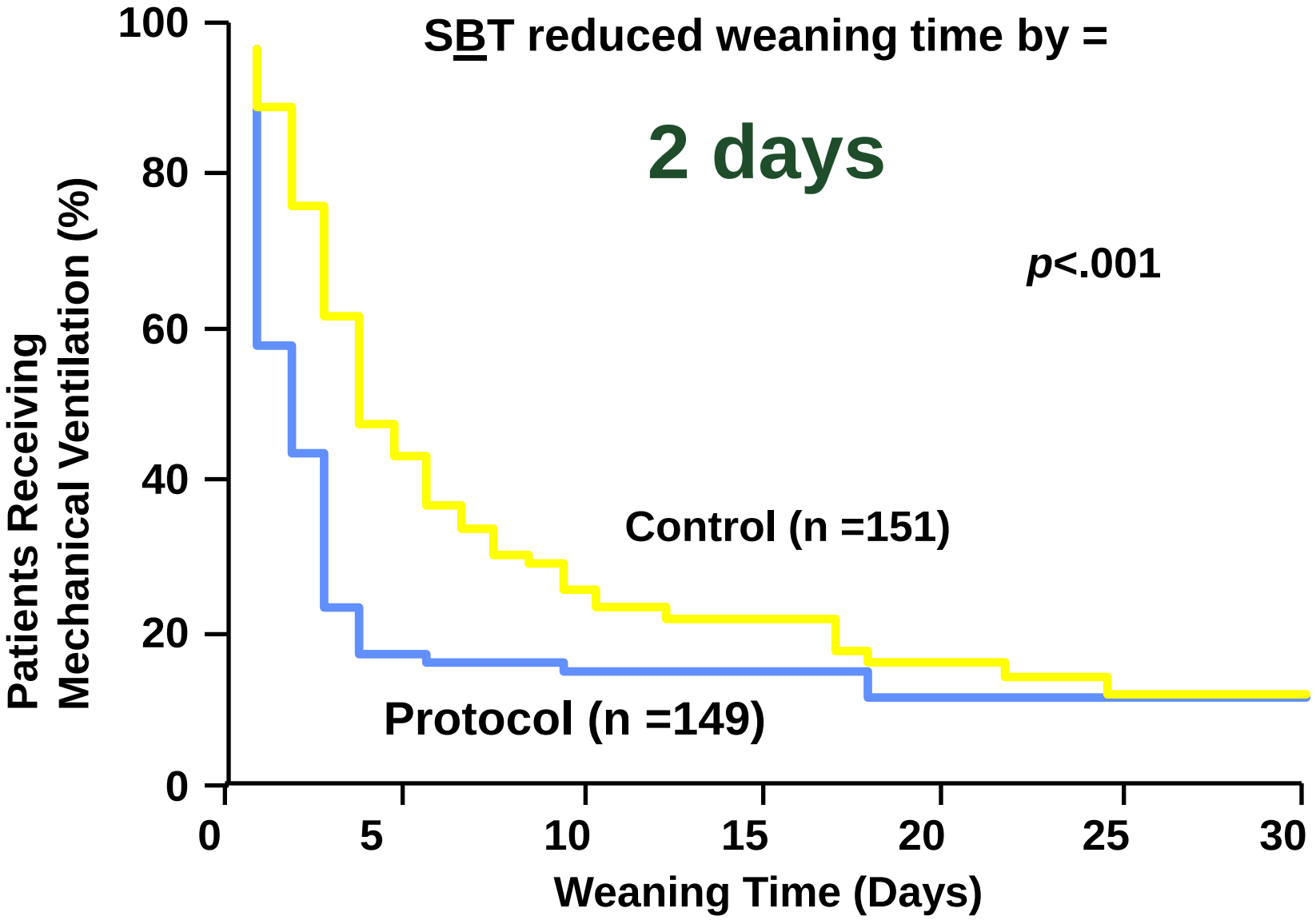
SAT Safety Screen

No active seizures
No alcohol withdrawal
No agitation
No paralytics
No myocardial ischemia
Normal intracranial pressure

SAT Failure

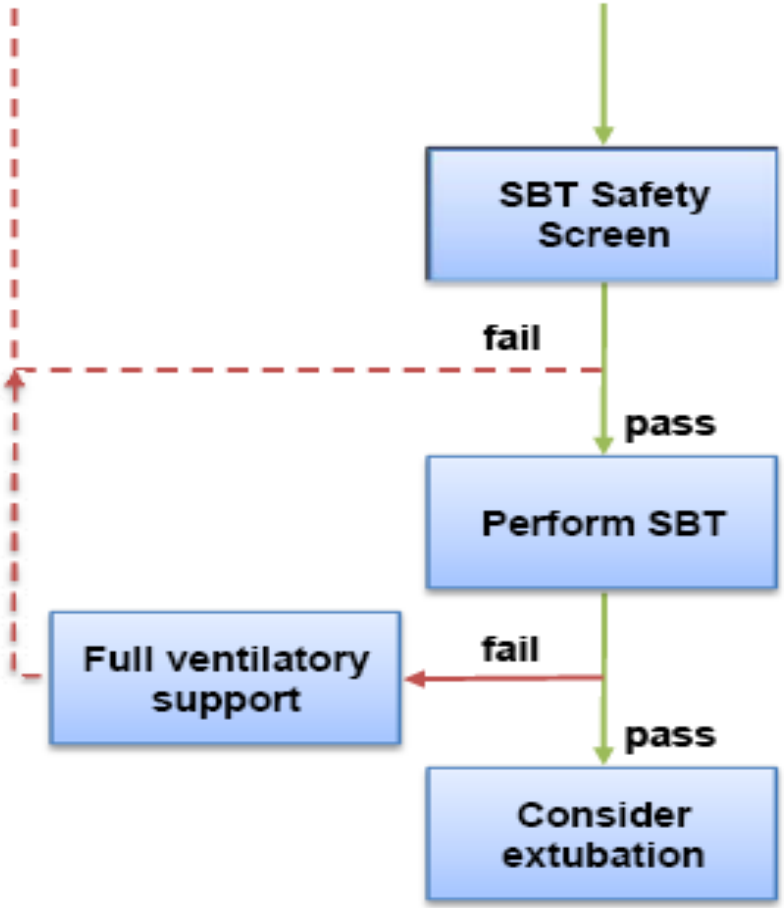
Anxiety, agitation, or pain
Respiratory rate > 35/min
SpO2 < 88%
Respiratory distress
Acute cardiac arrhythmia

Weaning protocol



Ely EW, et al. N Engl J Med 1996;335:1864-9

Spontaneous Breathing Trial



SBT Safety Screen

No agitation
Oxygen saturation ≥ 88%
FiO2 ≤ 50%
PEEP ≤ 7.5 cm H2O
No myocardial ischemia
No vasopressor use
Inspiratory efforts

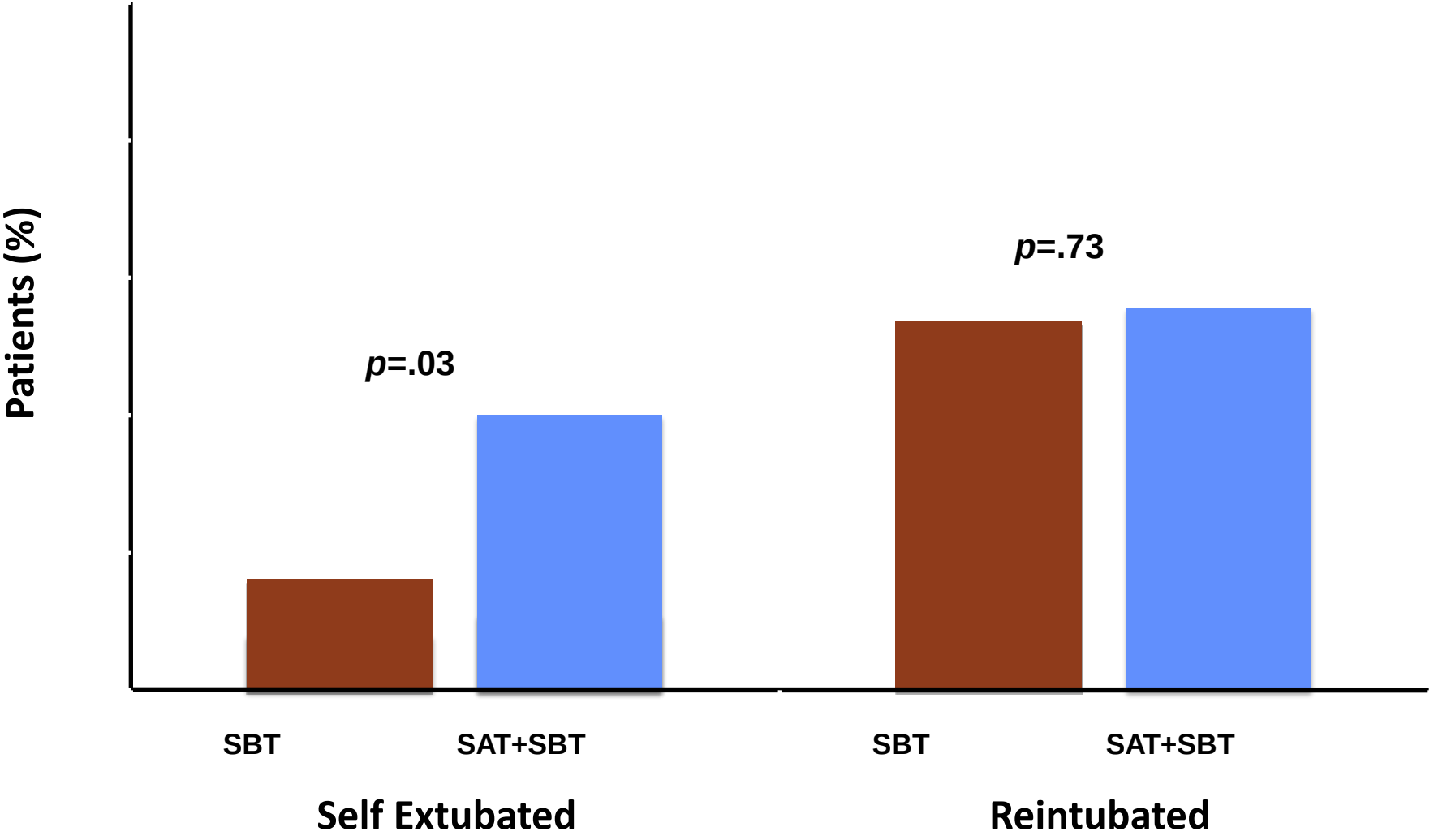
SBT Failure

Respiratory rate > 35/min
Respiratory rate < 8/min
SpO2 < 88%
Respiratory distress
Mental status change
Acute cardiac arrhythmia

*Adapted from Girard TD et al. *Lancet* 2008;371:126-34

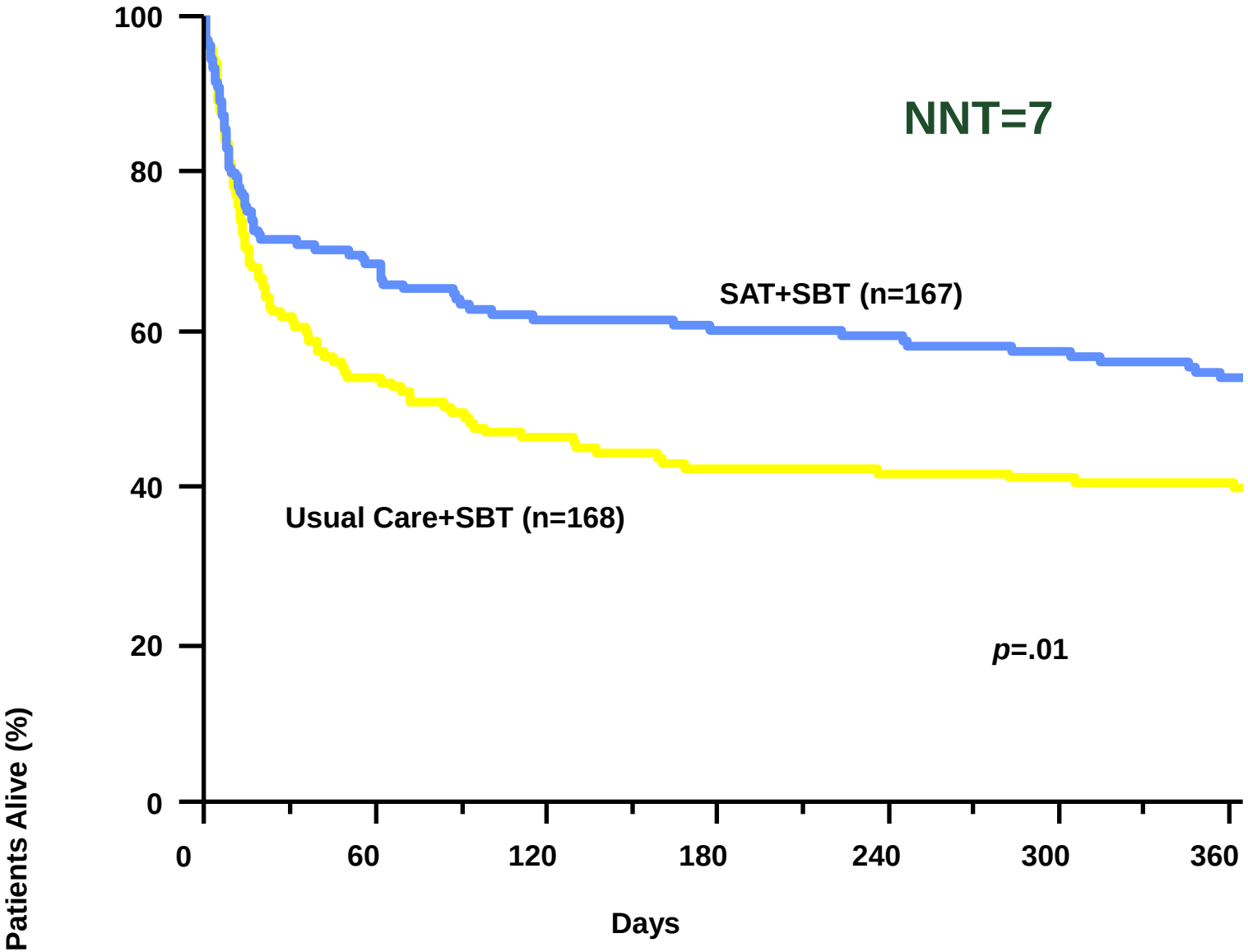
Adverse Events –

more self-extubations but <u>not</u> re-intubations



Girard TD, et al. Lancet 2008;371:126-34

One-Year Survival



Girard TD, et al. Lancet 2008;371:126-34

Okay, but does it mess with your head?

- **Sedation Interruption group had**
  - **Lower Impact of Events score**
    (11.2 vs. 27.3, p 0.02)
  - **Trend toward a lower incidence of PTSD (0% vs. 32%, p 0.06)**
  - **Trend toward a better total Psychosocial Adjustment to Illness score**
    (46.8 vs. 54.3, p 0.08)
- **NO!!! If anything it is <u>good</u> for your head**

What about other stuff?

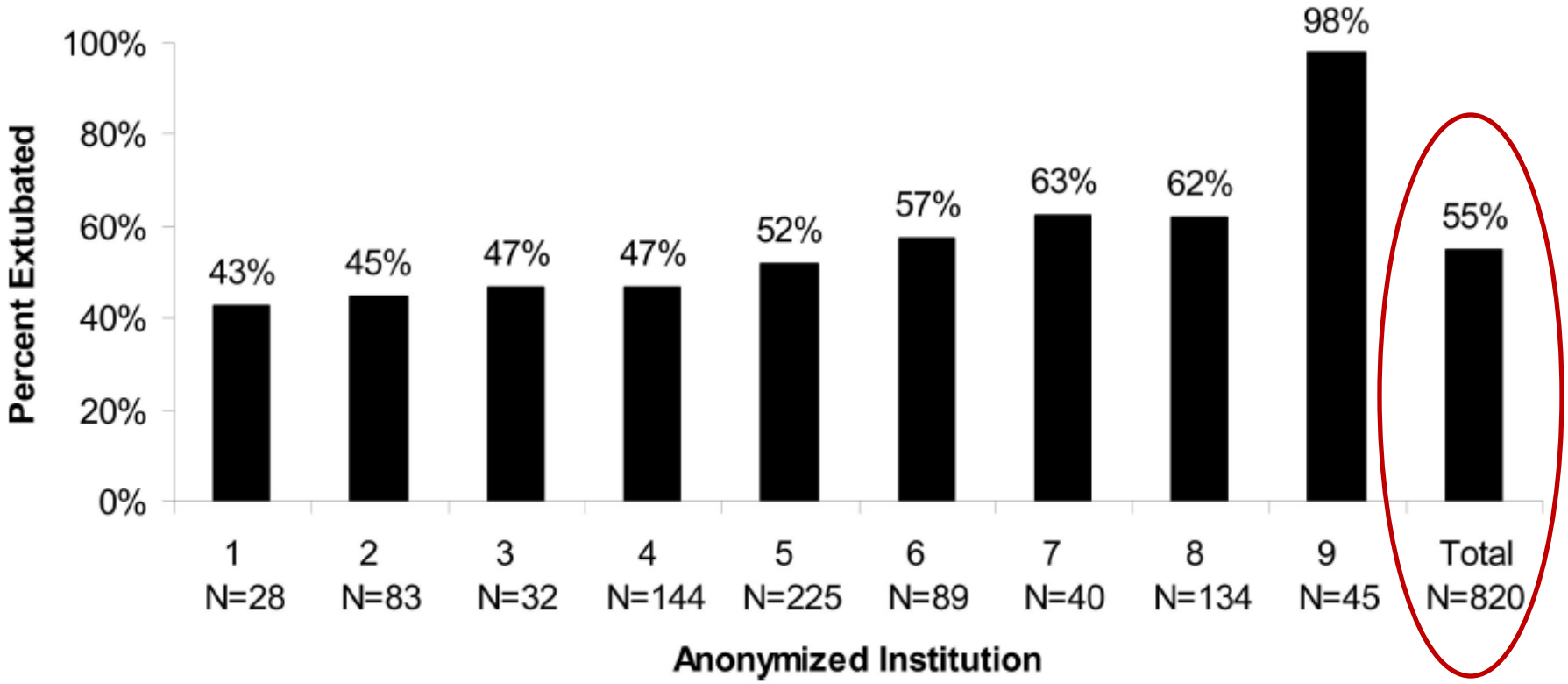
Complication	Intervention, No.	Control No.
VAP	2	5
Upper gastrointestinal hemorrhage	5	4
Bacteremia	4	7
Barotrauma	0	3
VTE	2	5
Cholestasis	0	1
Sinusitis	0	1
Total (No.)	13	26

Fewer overall complications with daily interruption

Crit Care Med 2004; 32:1272

Seems simple but . . .

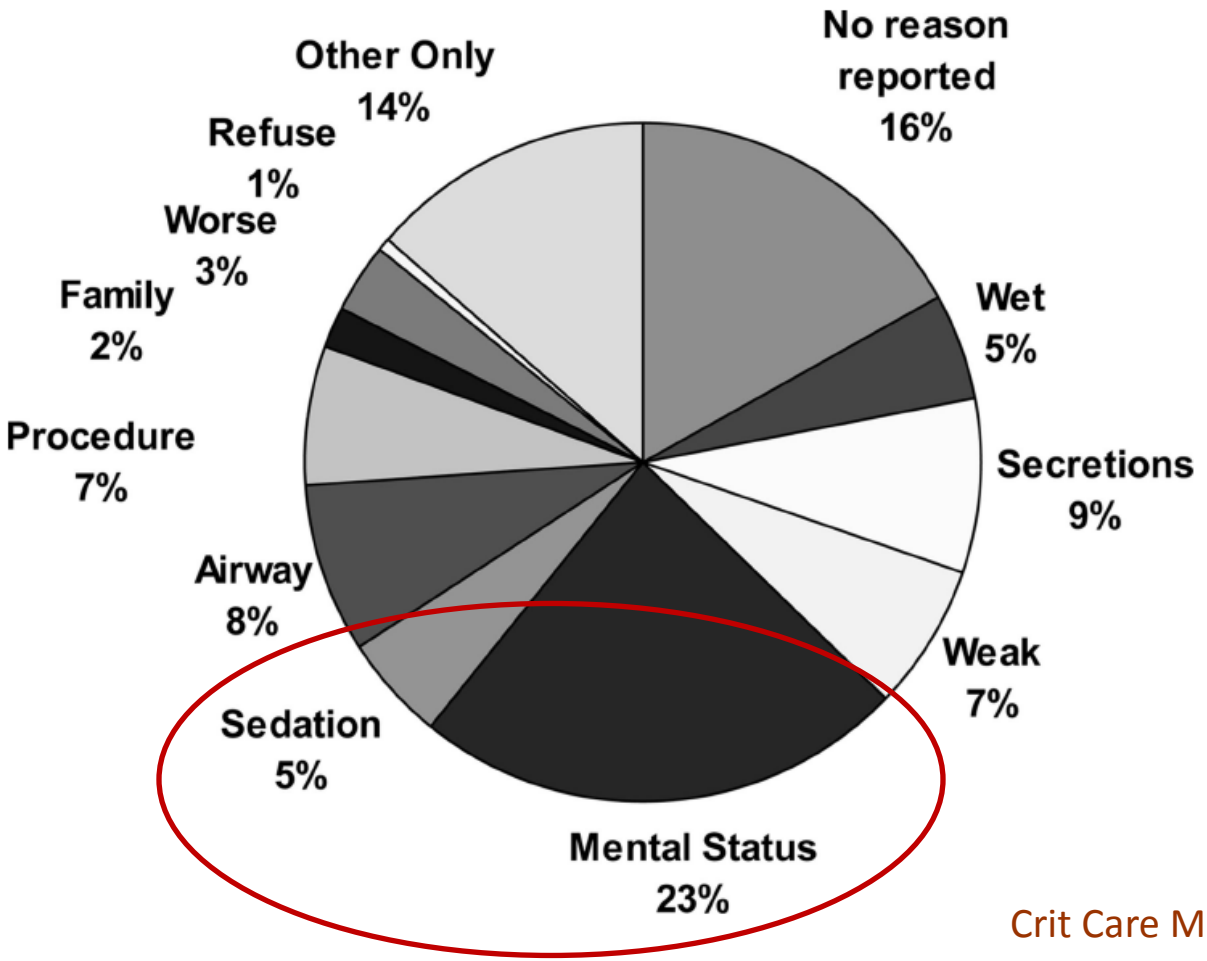
Only 55% of patients who pass an SBT are extubated



Crit Care Med 2008;36:2753

Seems simple but . . .

Often because of poor mental status and sedation



Crit Care Med 2008;36:2753

SAT + SBT – Off the vent sooner

	Intervention group (n=167)	Control group (n=168)	p value
Ventilator-free days*			
Mean	14·7 (0·9)	11·6 (0·9)	0·02
Median	20·0 (0 to 26·0)	8·1 (0 to 24·3)	
Time to discharge (days)			
From intensive care	9·1 (5·1 to 17·8)	12·9 (6·0 to 24·2)	0·01
From hospital	14·9 (8·9 to 26·8)	19·2 (10·3 to NA)†	0·04
28-day mortality	47 (28%)	58 (35%)	0·21
1-year mortality	74 (44%)	97 (58%)	0·01
Duration of brain dysfunction (days)			
Coma	2 (0 to 4)	3 (1 to 7)	0·002
Delirium	2 (0 to 5)	2 (0 to 6)	0·50
RASS at first successful SBT	−1 (−3 to 0)	−2·5 (−4 to 0)	0·0001
Complications			
Any self-extubation	16 (10%)	6 (4%)	0·03
Self-extubation requiring reintubation‡	5 (3%)	3 (2%)	0·47
Reintubation‡	23 (14%)	21 (13%)	0·73
Tracheostomy	21 (13%)	34 (20%)	0·06

Data are mean (SD), n (%), or median (IQR). RASS=Richmond agitation-sedation scale. SAT=spontaneous awakening trial. SBT=spontaneous breathing trial. *Ventilator-free days from study day 1 to 28. †Greater than 25% of patients in the SBT group remained in the hospital at study day 28. ‡Reintubation within 48 hours of extubation.

Lancet 2008;371:126

Turn the Evidence into behaviors: Implementation

- Understand current sedation practices for ventilated patients
- Sedation guidelines incorporating a sedation scale and pain scale
- Spontaneous Awakening Trial

Ideal Sedation Management

- Goal-directed approach
  - Objective measure of a desired goal
  - Frequent reassessment of that measure
  - Change therapy to achieve and remain at goal
- Utilize therapeutic approaches that are evidence-based
- Allow for **patient-centered** deviations as necessary

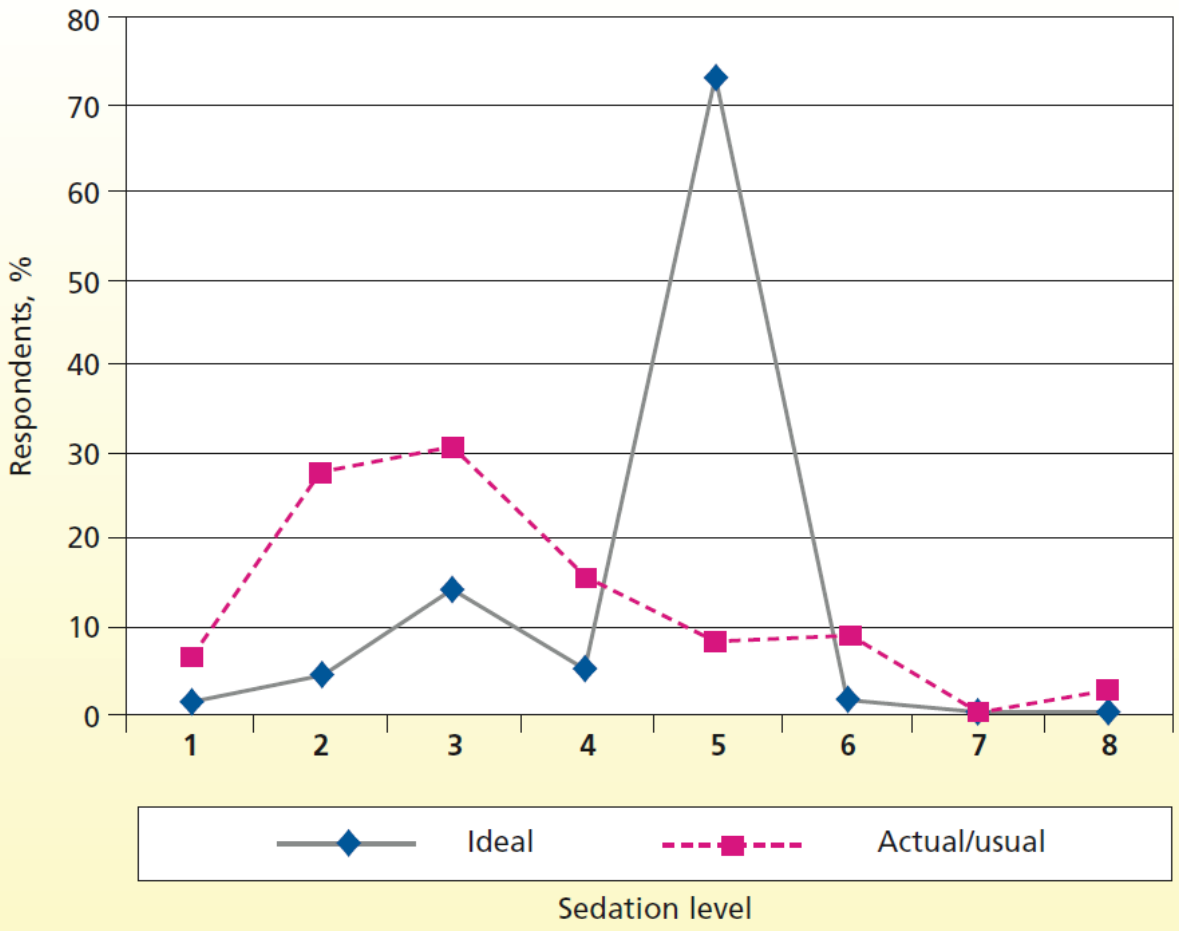
Consequences of Inadequate Sedation

- Anxiety
- Pain
- Patient-ventilator dysynchrony
  - Hypoxemia
- Agitation
  - Self-removal of tubes/catheters
- Myocardial ischemia

Consequences of Excessive Sedation

- Hemodynamic Effects
  - Hypotension
  - Bradycardia
- Neurologic Effects
  - Prolonged Coma
  - Respiratory Depression
- Ileus
- Prolonged Mechanical Ventilation

Sedation Level

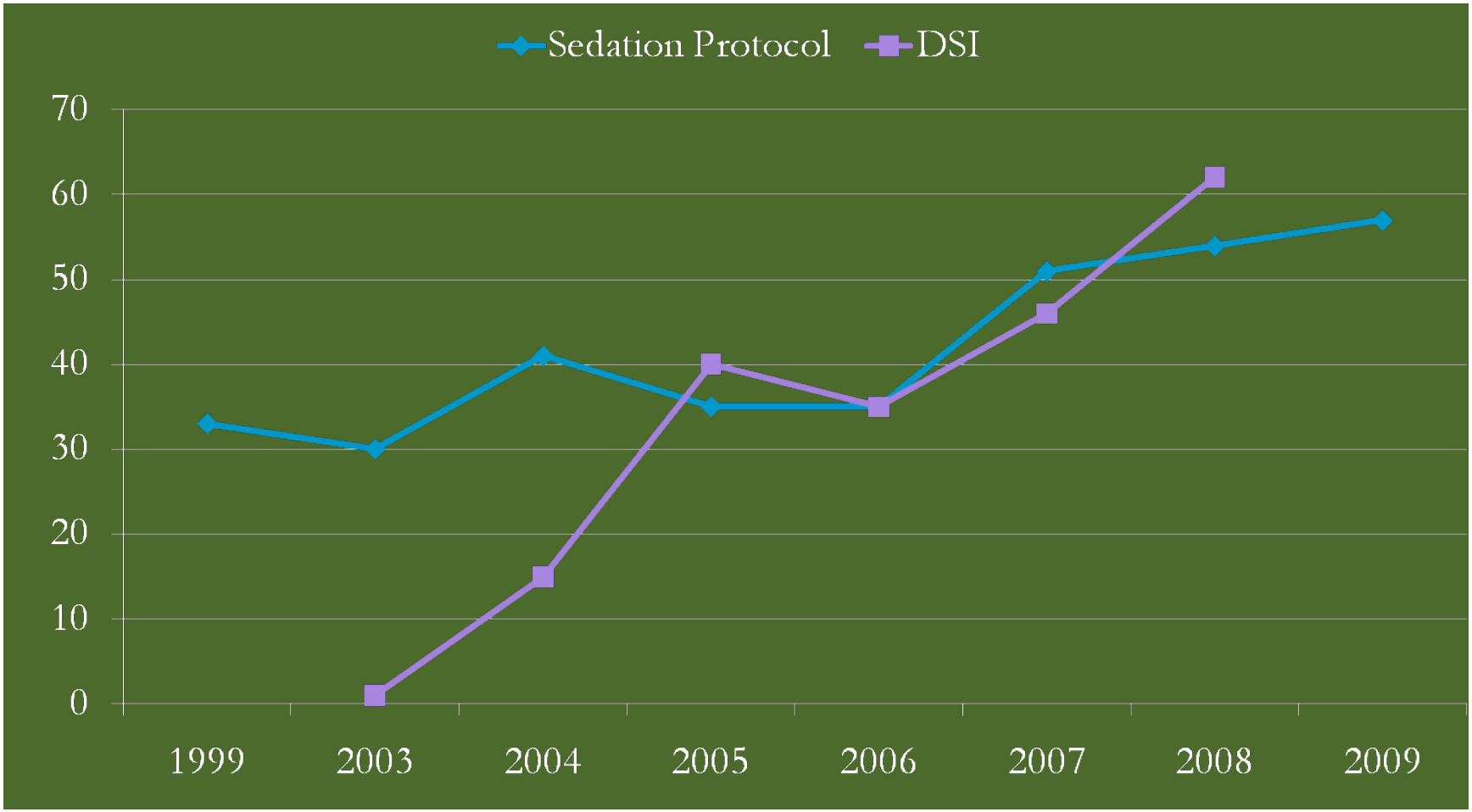


Sedation levels
1 = Unresponsive to painful stimuli
2 = Responsive to painful stimuli only
3 = Responsive to verbal stimuli
4 = Responsive to touch
5 = Interactive, calm, and cooperative
6 = Alert and occasionally agitated
7 = Agitated and pulling at catheters or tubes
8 = Aggressive and pulling

Figure Respondents' opinions on ideal vs usual sedation level of patients receiving mechanical ventilation (n = 235).

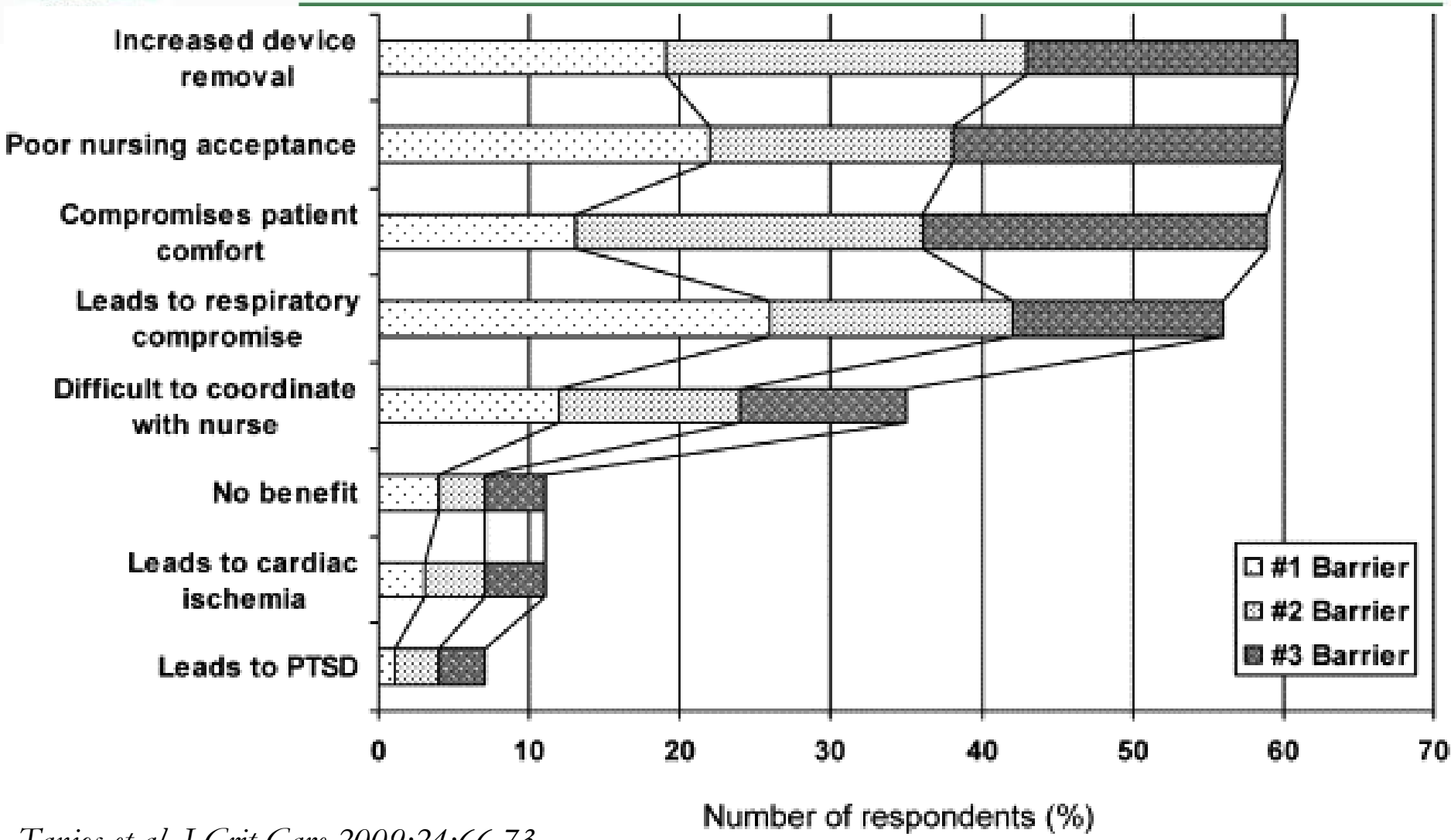
O'Connor et al. Am J Crit Care 2009

Sedation Practices



Mehta et al. Crit Care Clin 2009: 25: 471-8

Perceived Barriers to DSI



Tanios et al. J Crit Care 2009:24:66-73

DSI: A Deeper Dive

- Survey of 185 UK ICUs in 2000
- 163 (88%) reported using a sedation scale
- 148 (80%) reported having a sedation guideline
- 144 (78%) practiced DSI
- 99 (54%) audit compliance with DSI
  - 0 to 60%: 19%
  - 60 to 80%: 26%
  - 80 to 90%: 23%
  - 90 to 100%: 24%

Reschreiter et al. Crit Care 2008: 12: R152

Sedation Guidelines

- Choose a sedation scale
  - RASS or Ramsey

Richmond Agitation and Sedation Scale: RASS

TABLE 1. RICHMOND AGITATION–SEDATION SCALE

Score	Term	Description
+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitation	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	
−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

Procedure

1. Observe patient. Is patient alert and calm (score 0)?
   Does patient have behavior that is consistent with restlessness or agitation (score +1 to +4 using the criteria listed above, under DESCRIPTION)?
2. If patient is not alert, in a loud speaking voice state patient's name and direct patient to open eyes and look at speaker. Repeat once if necessary. Can prompt patient to continue looking at speaker.
   Patient has eye opening and eye contact, which is sustained for more than 10 seconds (score −1).
   Patient has eye opening and eye contact, but this is not sustained for 10 seconds (score −2).
   Patient has any movement in response to voice, excluding eye contact (score −3).
3. If patient does not respond to voice, physically stimulate patient by shaking shoulder and then rubbing sternum if there is no response to shaking shoulder.
   Patient has any movement to physical stimulation (score −4).
   Patient has no response to voice or physical stimulation (score −5).

Am J Respir Crit Care Med 2002; 166:1338

Ramsey Sedation Scale

Table 1 – Ramsay scale[4]

1	Patient anxious and agitated or restless, or both
2	Patient co-operative, orientated, and tranquil
3	Patient responds to commands only
4	Brisk response to a light glabellar tap or auditory stimulus
5	Sluggish response to a light glabellar tap or auditory stimulus
6	No response to the stimuli mentioned in items 4 and 5

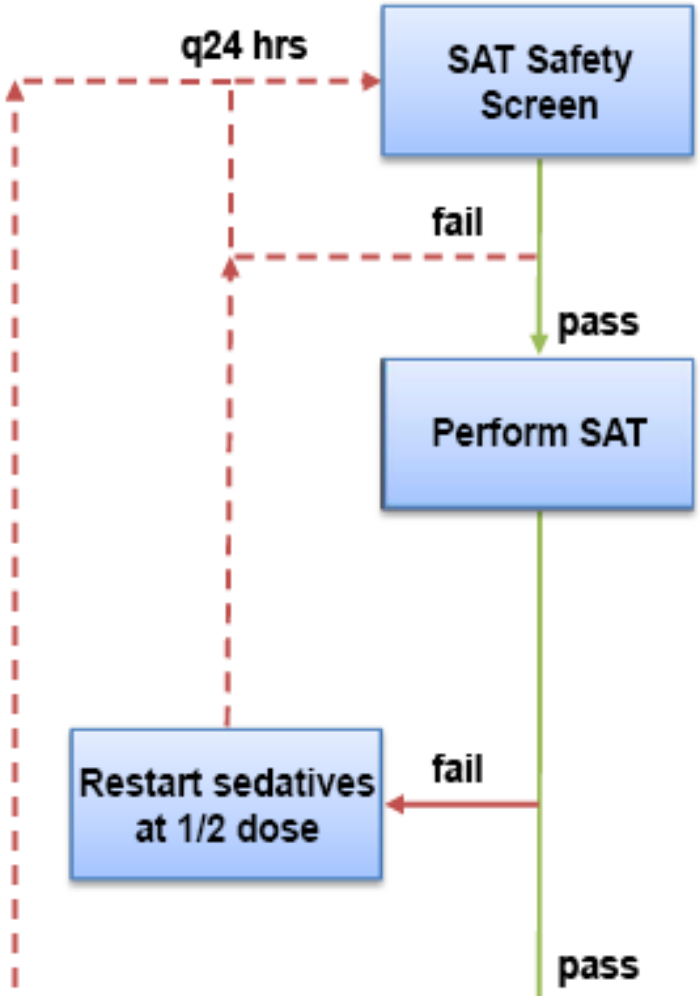
Develop Pain, Agitation and Delirium Management Algorthm

Sedation protocol and RASS Worksheet2010.pdf

Spontaneous Awakening Trial

- Define time of day to be done
- All continuous IV medication given for sedation should be completely turned off
- Evaluate for pass/fail
- If fail, restart sedative at ½ the previous dose

Spontaneous Awakening Trial



SAT Safety Screen

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SAT Failure

- Anxiety, agitation, or pain
- Respiratory rate > 35/min
- SpO2 < 88%
- Respiratory distress
- Acute cardiac arrhythmia

Educate

- Classroom Education
- Return Demonstration of completing assessment scales on real patients
- Self Learning module for new hires
- Bedside re-enforcement with case studies

Execute:
Create Independent Redundancy

Develop unique and separate system checks

- Standard Order Sets
- Multidisciplinary Rounds with Daily Goals
- Policies/procedures
- Pharmacist rounding on patients
- Algorithm
- Guidelines
- Pocket cards
- Fliers

Evaluate

- Collect data relating to compliance with use of Pain, agitation and delirium algorthm
- Collect data related to compliance with daily SAT
- Monitor VAP rate

Interventions To Ensure Patient Receive Evidence & Sustain Benefit

- Education…to all caregivers…it works*
- Empower nurses
- Products/Processes that make it easy for the frontline caregiver to provide the care
- Measurement/Feedback**
- Setting targets/Celebrating successes
- Placement of new practice/education in orientation
- Treat every infection as a DEFECT to learn from
- Clarify expectations related to new practice and hold staff accountable

Fuchs MA, et al. J Nurs Care Qual, 2011;26:101-109
Nolan SC, et al. JONA, 2010:40(9):374-383

* Parra AP, etal. Infect Control Hosp Epidemiol 2010;31(9):964-967
**Westwall S. Nursing in Critical Care, 2008;13(4):203-207
*** Barsuk JH, et al. Arch Intern Med, 2009;169:1420-1423

Thank you

QUESTIONS????