Practical Issues in the Implementation of an Early Mobilization Protocol

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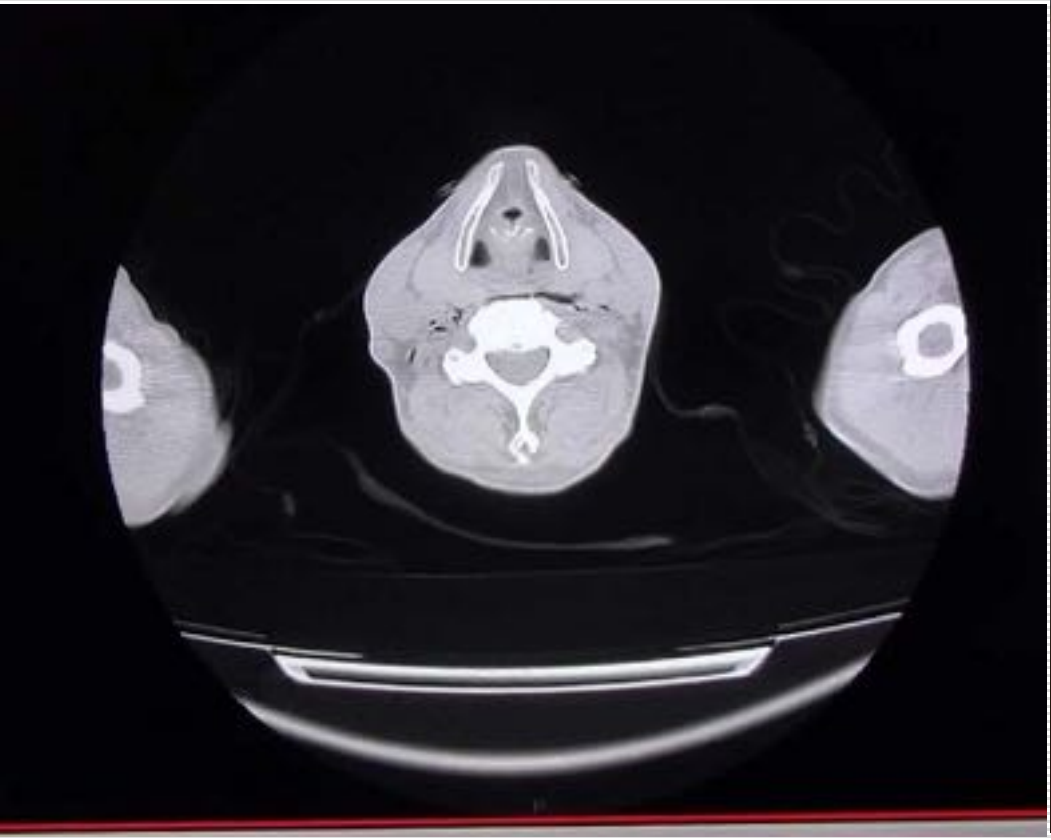
Acute respiratory failure



Outcomes of ARF patients

Crit Care Med 2008; 36:1523

Intensive Care Med 2006; 32: 1115

- Survival rate at hospital discharge; 89%
- Functional recovery in ARF is delayed often beyond six months post-discharge.
- Common problems after discharge
  - Physical de-conditioning
  - Psychological sequelae
  - Neuromuscular dysfunction

Outcomes of ARDS survivors

NEJM 2003; 348: 683

CONCLUSIONS

Survivors of the acute respiratory distress syndrome have persistent functional disability one year after discharge from the intensive care unit. Most patients have extrapulmonary conditions, with muscle wasting and weakness being most prominent.

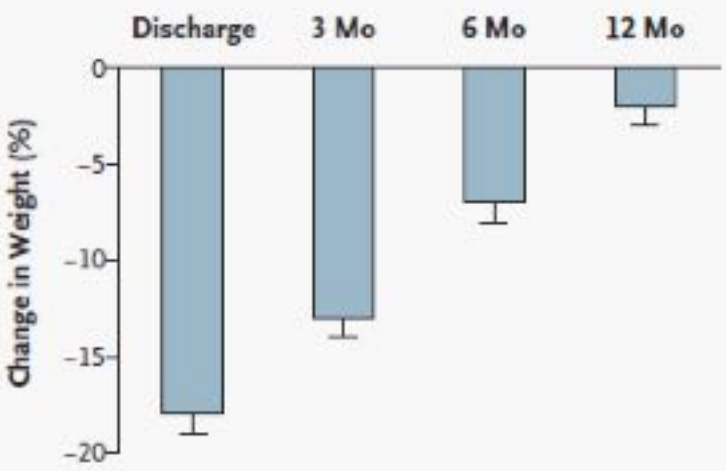


Figure 2. Mean (+SE) Change in Weight from Base Line among Patients with the Acute Respiratory Distress Syndrome at the Time of Discharge from the ICU and at 3, 6, and 12 Months.

Table 2. Recovery of Pulmonary Function among Patients with the Acute Respiratory Distress Syndrome during the First 12 Months after Discharge from the ICU.

Variable	3 Mo (N=71)*	6 Mo (N=77)†	12 Mo (N=80)‡
	median (interquartile range)		
Forced vital capacity (% of predicted)	72 (57–86)	80 (68–94)	85 (71–98)
Forced expiratory volume in one second (% of predicted)	75 (58–92)	85 (69–98)	86 (74–100)
Total lung capacity (% of predicted)§	92 (77–97)	92 (83–101)	95 (81–103)
Residual volume (% of predicted)§	107 (87–121)	97 (82–117)	105 (90–116)
Carbon monoxide diffusion capacity (% of predicted)§¶	63 (54–77)	70 (58–82)	72 (61–86)

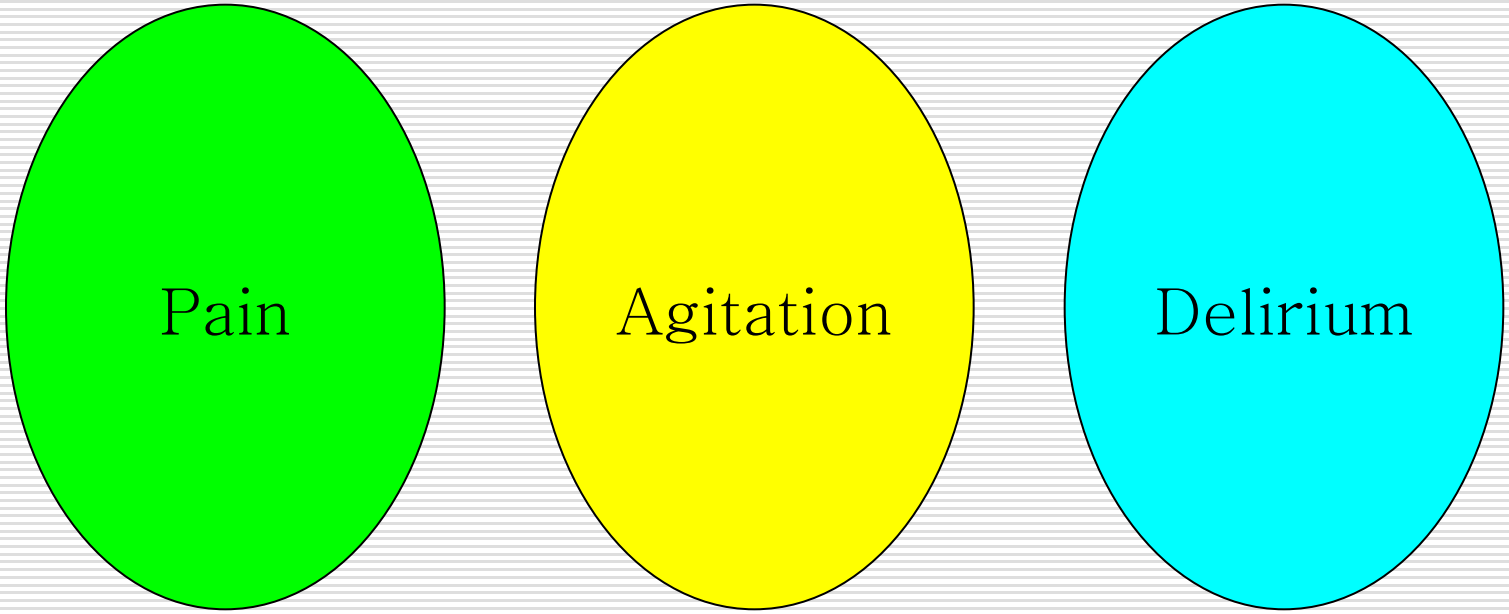
Improving QOL

- Prevent deep sedation
- Prevent delirium
- Early mobilization

Changing Culture

PAD guidelines

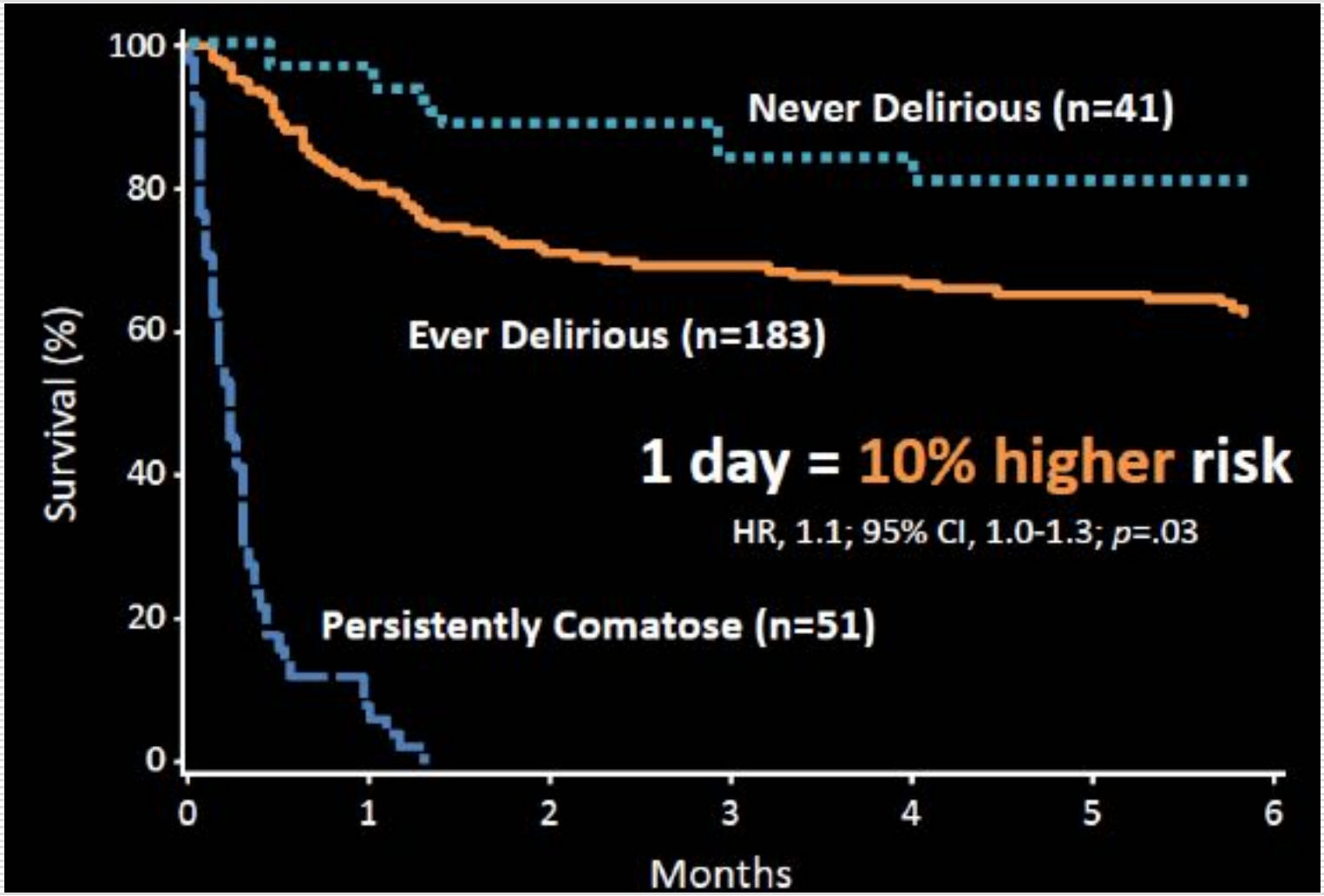
Crit Care Med 2013; 41: 263



- Use scale to assess objectively
- Analgesia-first sedation
- Prevent deep sedation
- Strategies; protocols, check lists, multi-professional approach

Delirium during ICU stay

JAMA 2004; 291: 1753



Impact of Delirium on Outcome

BMJ 2015; 350: h2538

RESEARCH

Outcome of delirium in critically ill patients: systematic review and meta-analysis

Jorge I F Salluh,[1] Han Wang,[2] Eric B Schneider,[2] Neeraja Nagaraja,[2] Gayane Yenokyan,[3] Abdulla Damluji,[4] Rodrigo B Serafim,[1,5] Robert D Stevens[6]

- Delirium was identified in 31.8% of critically ill patients
- Associated with worse outcomes
  - In-hospital mortality; RR 2.19
  - Longer duration of MV
  - Longer LOS in ICU
  - Longer LOS in hospital

Impact on cognitive function

Crit Care Med 2012; 40: 112

Delirium in critically ill patients: Impact on long-term health-related quality of life and cognitive functioning*

Mark van den Boogaard, RN, MSc; Lisette Schoonhoven, RN, PhD; Andrea W.M. Evers, PhD; Johannes G. van der Hoeven, MD, PhD; Theo van Achterberg, RN, PhD; Peter Pickkers, MD, PhD

- Delirium+ survivors
  - made significantly more social blunders
  - their total cognitive failure questionnaire score was significantly higher
- Duration of delirium was significantly correlated to problems with memory and names.

Prevention of Delirium

http://www.mc.vanderbilt.edu/icudelirium/

- ABCDEs of prevention and Safety
  - spontaneous Awakening and Breathing
  - attention to the Choice of Sedation
  - Delirium monitoring
  - Early mobility and exercise

Early Mobilization; Safe and Feasible

- Bailey, P. — Crit Care Med 2007; 35: 112
  - No accidental extubations
  - Adverse events; less than 1% of activities
  - 40% of activities done with tracheal tube

- Morris, PE — Crit Care Med 2008; 36: 2238
  - out of bed earlier (5 vs. 11 days, p ≦0.001)
  - similar low complication rates
  - Adjusted LOS was shorter
    - ICU LOS; 5.5 vs. 6.9 days (p = .025)
    - hospital LOS; 11.2 vs. 14.5 days (p = .006)

Early Mobilization; benefits

Lancet 2009; 373: 1874

Subjects; MV>72h	Intervention (n=49)	Control (n=55)	p value
Return to independent functional status at hospital discharge	29 (59%)	19 (35%)	0·02
ICU delirium (days)	2·0 (0·0–6·0)	4·0 (2·0–7·0)	0·03
Time in ICU with delirium (%)	33% (0–58)	57% (33–69)	0·02
Hospital delirium (days)	2·0 (0·0–6·0)	4·0 (2·0–8·0)	0·02
Hospital days with delirium (%)	28% (26)	41% (27)	0·01
Barthel Index score at hospital discharge	75 (7·5–95)	55 (0–85)	0·05
ICU-acquired paresis at hospital discharge	15 (31%)	27 (49%)	0·09
Ventilator-free days*	23·5 (7·4–25·6)	21·1 (0·0–23·8)	0·05
Duration of mechanical ventilation (days)	3·4 (2·3–7·3)	6·1 (4·0–9·6)	0·02
Duration of mechanical ventilation, survivors (days)	3·7 (2·3–7·7)	5·6 (3·4–8·4)	0·19
Duration of mechanical ventilation, non-survivors (days)	2·5 (2·4–5·5)	9·5 (5·9–14·1)	0·04
Length of stay in ICU (days)	5·9 (4·5–13·2)	7·9 (6·1–12·9)	0·08
Length of stay in hospital (days)	13·5 (8·0–23·1)	12·9 (8·9–19·8)	0·93
Hospital mortality	9 (18%)	14 (25%)	0·53

Data are n (%), median (IQR), or mean (SD). ICU=intensive care unit. *Ventilator-free days from study day 1 to day 28. Barthel Index scale 0–100, APACHE II scale 0–71.

What are the barriers?

Cardiopulm Phys Ther J 2012; 23: 26

What Are the Barriers to Mobilizing Intensive Care Patients?

I Anne Leditschke, FRACP, FCIC, MMgt;[1] Margot Green, Bachelor of Applied Science (Physiotherapy);[2] Joelie Irvine, BPhysio;[3] Bernie Bissett, Bachelor of Applied Science (Physiotherapy) (Hons);[4] Imogen A. Mitchell, FRCP FRACP FCICM[5]

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- Analysis from Australian cardiovascular surgery ICU
- The followings are effective for EM
  - Changing site of vascular catheter
  - Careful scheduling of procedures
  - Improved sedation management

What are the barriers?

BMC Anesthesiol 2014; 14: 84

Jolley et al. BMC Anesthesiology 2014, 14:84
http://www.biomedcentral.com/1471-2253/14/84

BMC Anesthesiology

RESEARCH ARTICLE Open Access

Medical intensive care unit clinician attitudes and perceived barriers towards early mobilization of critically ill patients: a cross-sectional survey study

Sarah E Jolley[1,4*], Janet Regan-Baggs[2], Robert P Dickson[3] and Catherine L Hough[1]

- Analysis from Medical ICU
- MICU clinicians reported knowledge of EM in the ICU
- Staffing and clinician time were frequently identified cross-disciplinary barriers.
- Risk of self-injury and excess work stress were frequently reported RN and PT barriers.

Potential Barriers to implement EM

- Deep sedation
  - Limits patient participation
  - Delays the first rehabilitation
- Lack of knowledge (education)
  - Results in self-limitation of caregivers
  - Leads to ignore or non-cooperation
- Inadequate ICU staffing
  - Increases staff workload (quantity)
  - Lacks effective leadership (quality)
  - Leads loss of collaboration

Concerns about;
- symptoms
- lines and catheters
- risk of fall etc.

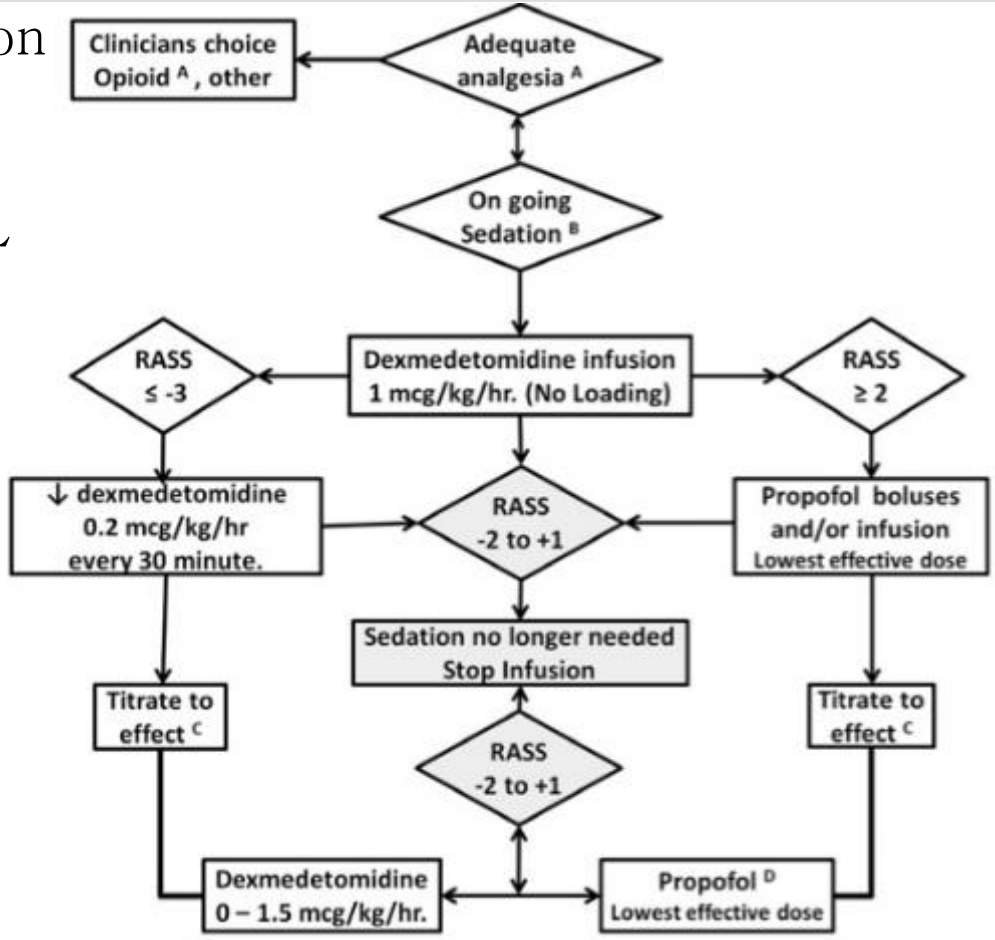
How to overcome the Barriers?

- Deep sedation
  - Use scales and protocols
  - Share clear criteria for deep sedation
- Lack of Education
- Inadequate Staffing

Barriers; sedation issue

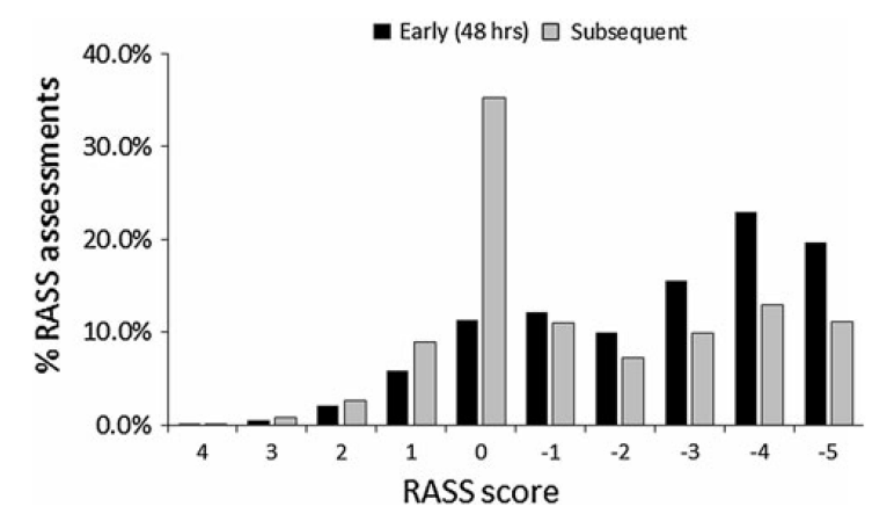
Crit Care Med 2013; 41: 1983

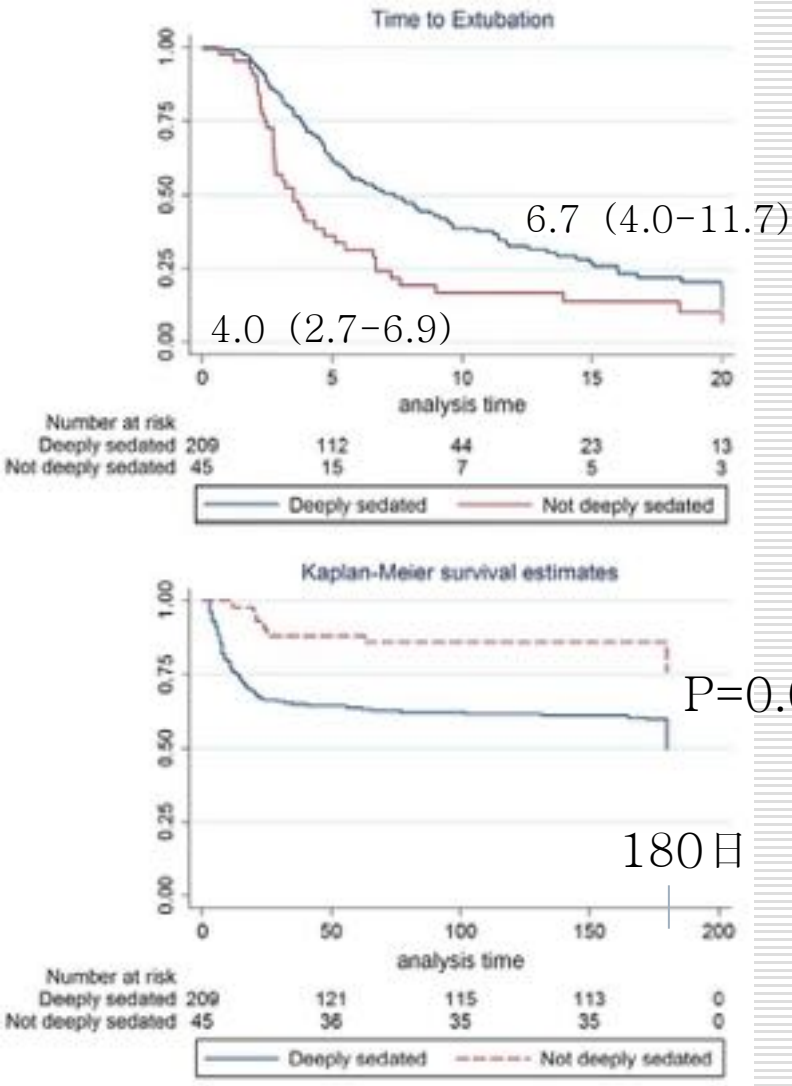
- Early Goal-Directed Sedation
- Using RASS to monitor
- In accordance with PDA-GL
- Priority; analgesia (opioid)
- Sedation; Dexmedetomidine
- Supplemental: Propofol
- No Benzo
- Starts within 6 hours



Impact of Protocol

Intensive Care Med 2013; 39: 910





- Prospective study in Malaysia
- Similar results with ANZ
- EGDS provided standardization of sedation in different culture and different medical system.

Indication for deep sedation

- Treatment of Severe ARDS
  - Muscle paralysis for the first 48 hours
  - Prone positioning for 16 hours per day
  - Induction of ECMO
- Need specific reasons for
  - Depth
  - Duration of deep sedation

How to overcome the Barriers?

- Heavy sedation
  - Use scales and protocols
  - Share clear criteria for deep sedation
- Lack of Education
  - Lectures? Experience?
  - Who teaches? Who leads the team?
- Inadequate Staffing
  - Quantity
  - Quality

Education, leadership, collaboration

J Crit Care 2015; 30: 13

Enhancing rehabilitation of mechanically ventilated patients in the intensive care unit: A quality improvement project☆

David McWilliams, MSc [a,*], Jonathan Weblin, BSc [a], Gemma Atkins, MSc [a], Julian Bion, FRCP, FRCA, MD [b], Jenny Williams, RN [b], Catherine Elliott, MSc [a], Tony Whitehouse, FRCA, MD [b], Catherine Snelson, MBChB, MRCP [b]

[a] Therapy Services, University Hospitals Birmingham NHS Foundation Trust, Queen Elizabeth Hospital Birmingham, Birmingham, UK
[b] Critical Care, University Hospitals Birmingham NHS Foundation Trust, Queen ElizabethHospital Birmingham, Birmingham, UK

- Members; physiotherapists, consultants, nurses, dietitian
- Engage and educate the whole team through individual bedside training and clinical meetings
- Create physiotherapy subteam for leading team
- Use wall chart with a visible prompt to optimize staff engagement
- Discussing progress, barriers, and solutions at weekly multidisciplinary rehab meetings promotes collaboration
- 4Es; Engage, Educate, Execute, Evaluate

Factors to sustain EM

J Crit Care 2015; 30: 698

Implementing and sustaining an early rehabilitation program in a medical intensive care unit: A qualitative analysis

Michelle N. Eakin, PhD [a,b,*], Linda Ugbah, MHS [a], Tamara Arnautovic, MHS [a], Ann M. Parker, MD [a,b], Dale M. Needham, MD, PhD [a,b,c]

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[c] Department of Physical Medicine and Rehabilitation, Johns Hopkins University, Baltimore, MD, USA

- Necessary components
  - All staff need to believe "EM is beneficial."
- Implementation strategies
  - Team Centered Approach
  - Staff education
- Perceived barriers; ↑workload, safety concerns
- Positive outcomes; improvement, satisfaction

Take home messages

- Prevention of deep sedation, delirium, and immobilization are important to improve QOL.
- EM in the ICU is safe, feasible, and beneficial. (Believe it!)
- To implement EM in the ICU, we have to overcome potential barriers.
- Use of scales and protocols is strongly recommended to perform light sedation.
- Education, effective leadership, collaboration are essential to overcome barriers.