Abstract Presentations

1. A Three Part Educational Intervention to Enhance Nursing Knowledge of ICU Delirium: **Cynthia K. Fine, MSN**; Christine DeForge, BSN; Natalie Yip, MD; Abigail Zemmelman, OTR/L; Amy Dzierba, Pharm. D; Patrick Ryan, MS; Winsoe Overstreet, MSN
   Affiliation: New York Presbyterian Hospital: Columbia Irving University Medical Center

2. Early In-Line Speaking Valve Use Improves Outcomes for Long- Term Acute Care Hospital Patients: **Beth Sarfaty, PT, MBA**; Amanda Dawson, PhD; Tessa Terwilliger, RN; Erica Hill, MPA; Elizabeth Hoffert, RN; Nancy Toms, SLP-CC; LoriAnn Kettler, RT; Samuel Hammerman, MD
   Affiliation: Select Medical

3. Surviving Critical Illness, What is Next? An Expert Consensus Statement on Physical Rehabilitation After Critical Illness: **M.E. Major**, R. Kwakman, M.E. Kho, B. Connolly, D. McWilliams, L. Denehy, S.Hanekom, S. Patman, R. Gosselink, C. Jones, F. Nollet, D.M. Needham, R.H.H., Engelbert, M. van der Schaaf
   Affiliation: Amsterdam University of Applied Sciences, Amsterdam, The Netherlands

4. Mobility in the Critically Ill Pediatric Patient on ECMO Support: **Jennifer E. Snider, MSN, CPNP-AC**; John Young, RRT; Margret Birdsong, MSN, CPNP, CWON; Sapna R. Kudchadkar, MD; Alejandro Garcia, MD; Emily Warren, MSN, CNS; Yun Kim, MS, OT/L; Angela Prouty, Kieran McGuigan, Melania Bembea, MD, PhD
   Affiliation: Johns Hopkins University School of Medicine

5. When There Aren't Enough People: Promoting Interdisciplinary Mobility Throughout the ICU Stay Through Use of Safe Patient Handling and Mobility Equipment: **Margaret Arnold, PT, CEES, CSPHP**
   Affiliation: Inspire Outcomes LLC

6. Evaluation of Safety and Quality Following Implementation of an Early Mobilization Program in a Pediatric Intensive Care Unit: Cosme Taipe RN; Brittany Sobin RN; **Bettina Di Franco, OT**; Alix Watson CCLS; Chani Traube MD; Christine Joyce, MD
   Affiliation: New York Presbyterian Weill Cornell

Abstract Presentations

8. Families PICU Up!: Evaluating Family Perspectives and Needs for Development of a PICU Family Engagement Program: **Emily Warren**, Emily Carlton, Shae Blount, Beth Wieczorek, Carrie Potter, Sapna R. Kudchadkar on behalf of the PICU Up! Task Force
   Affiliation: Johns Hopkins Hospital

9. Exploring Nursing Perceptions to Early Mobilization in the Cardio- Thoracic Intensive Care Unit at Columbia Irving University Medical Center: **Alicia Tucker, BSN, RN**, Cynthia Fine MSN, CRRN, Deborah Burns MSN, CNS
   Affiliation: Columbia Irving University Medical Center

10. Understanding Perceived Barriers to Patient Mobility in a Medical ICU Using a Validated Early Mobility Barriers Survey: **Carrie M. Goodson, MD MHS**; Lisa A. Friedman, ScM; Earl Mantheiy, BA; Kevin Heckle, BS; Annette Lavezza, OTR/L; Amy Toonstra, PT DPT CCS; Ann Parker, MD; Jason Seltzer, PT DPT; Michael Velaetis, PA-C MS; Mary Glover, MSN RN CCRN; Caroline Outten, BSN RN CCRN; Kit Schwartz, BS RRT MHA; Antionette Jones, PCT; Sarah Coggins, OTR/L; Dale M. Needham, FCPA MD PhD
    Affiliation: Division of Pulmonary and Critical Care Medicine, Johns Hopkins School of Medicine

11. Creating a Protocol for the Mobilization of Patients with Critical Lines: A Physical Therapist Driven Multidisciplinary Initiative: **Sara Krasney, PT, DPT**; Janelle Jablonski, PT, DPT; Allison Kras, PT, DPT
    Affiliation: Tufts Medical Center

12. Intensive Care Physiotherapy during Extracorporeal Membrane Oxygenation for Acute Respiratory Distress Syndrome: Munshi L, Kobayashi T, DeBacker J, Doobay R, Telesnicki T, Lo V, **Cote N**, Cypel M, Keshavjee S, Ferguson ND, Fan E.
    Affiliation: University Health Network, Toronto General Hospital

Poster Presentations

1. Networking for Occupational Therapists: The Significance of The NYC OT ICU Discussion Group
   Lauren Cohen, BS, MS
   Affiliation: New York Presbyterian Hospital - Columbia University Medical Center

2. Patient- and Family-Centered Occupational Therapy with a Patient with Bilateral Subarachnoid Hemorrhage with Right Middle Cerebral Artery Bifurcation Aneurysm
   Sela Han, MS Neuroscience, MSOT
   Affiliation: St. Jude Medical Center in Fullerton, CA

3. Safe Ambulation of a Patient with an Axillary Intra-aortic Balloon Pump as a Bridge to Heart Transplant: A Case Report
   Sung J. Cho, SPT
   Affiliation: UF Health Shands Hospital

4. Acute Critical Care in the Classroom: Designing Realistic and Effective Teaching Tools Throughout Curriculum
   Andrea Attorri, PT, DPT
   Affiliation: Wake Forest Baptist Health

5. Training the Next Generation of ICU Early Mobilization Therapists
   Lauren Cohen, BS, MS
   Affiliation: New York Presbyterian Hospital-Columbia University Medical Center

6. Utility of Early Mobility in Post Open Heart Surgery Patients
   Dalton Morgan, BS
   Affiliation: Southern Illinois Healthcare

7. ICU Rehab in a Small Community Hospital
   Samantha Bates, MOTR/L
   Affiliation: Camden Clark Medical Center

8. A Country-Wide Educational System for Early Mobilization
   Hajime Katsukawa, PhD
   Affiliation: Japanese Society for Early Mobilization

Poster Presentations

9. Development and Implementation of a Pediatric Intensive Care Unit Diary
   Elizabeth A. Herrup, MD
   Affiliation: Johns Hopkins department of anesthesia and critical care medicine

10. What Makes Early Mobilization Different in the Neurologic ICU?
    Carly Goldberg, MS
    Affiliation: NYPH-Columbia

11. The Mobilization of Multiple Patients Requiring Biventricular Support Via CentriMag: A Retrospective Case Study
    Allison Kras, DPT
    Affiliation: Tufts Medical Center

12. Safety of Chest Physiotherapy for Acute Respiratory Distress Syndrome During Venovenous Extracorporeal Membrane Oxygenation: A Case Report
    Tsung-Hsien Wang, PhD student
    Affiliation: Landseed Hospital, Taiwan

13. Importance of Early Mobilization in Mechanically Ventilated Oncology Patient Receiving Chemotherapy and Radiation
    Lindsay Riggs, BS, DPT
    Affiliation: The Ohio State University Wexner Medical Center/The James Cancer Hospital

14. A Quality Improvement Initiative to Optimize Goal-Directed Sedation in the Pediatric Intensive Care Unit
    Meghan Shackelford, MSN, CRNP-AC
    Affiliation: Johns Hopkins University School of Medicine

15. The Incidence, Characteristics and Effects of Chronic Pain in ICU Survivors
    Helen Devine, BSc (Hons) Pg Dip
    Affiliation: NHS Greater Glasgow and Clyde

16. Picking up the Pieces -Qualitative Evaluation of Follow-Up Consultations with Patients Post Intensive Care Treatment
    Ann Louise Hanifa, B.Sc
    Affiliation: Aalborg University Hospital

Poster Presentations

17. Correlation of Pre-Surgery Frailty-Related Measurements with Post-Transplant Outcomes in Patients After Lung Transplant
    Angela N Henning, MSPT, B.Sc, B. HSc
    Affiliation: University of Kentucky HealthCare

18. Mobility Level as an Indicator of Survival for Patients Requiring Acute Mechanical Circulatory Support Via Axillary Impella 5.0
    Allison Kras, DPT
    Affiliation: Tufts Medical Center

Abstract Presentations

6th Annual Johns Hopkins Critical Care Rehabilitation Conference

Baltimore, MD

AMAZING THINGS ARE HAPPENING HERE

A Three Part Educational Intervention to Enhance Nursing Knowledge of ICU Delirium

11.03.17

Columbia University Medical Center

NewYork-Presbyterian
Columbia University Medical Center

Greetings from NYP: Columbia University Irving Medical Center

What is Delirium?

- Delirium is defined as a disturbance of consciousness with inattention accompanied by a change in cognition or perceptual disturbance that develops over a short period of time (hours to days) and fluctuates over time [The Diagnostic and Statistical Manual of Mental Disorders (DSM IV)].

What do we know about Delirium?

- Delirium is an under recognized, under diagnosed problem that according to the literature occurs in anywhere from thirty to ninety percent of patients in the ICU.
- It is unpredictable.
- It has **multiple causes** which are often hard to pinpoint. (Vanderbilt University)
- It has an impact on outcomes: short term and long term.

Impact of Delirium on Outcomes

- Increased ICU Length of Stay (8 vs 5 days)
- Increased Hospital Length of Stay (21 vs. 11 days)
- Increased time on the Ventilator (9 vs4 days) -Higher costs ($22,000 vs $13, 000 in ICU costs)
- Estimated $4 to $16 billion associated U.S. costs
- 3-fold increased risk of death
- Possibly increased Long-Term Cognitive Impairment (aka, ICU accelerated dementia)

Ely. ICM2001; 27, 1892-1900 Ely, JAMA 2004; 291: 1753-1762 Lin, SM CCM 2004; 32: 2254-2259 Milbrandt E.,CCM 2004; 32:955-962. Jackson. Neuropsychology Review 2004; 14: 87-98.

Types of Delirium

- Delirium is often invisible unless you are assessing for it!
- There are three motoric types of delirium:
  - hyperactive (often called ICU Psychosis): < 1% of all patients who are diagnosed with delirium!
  - hypoactive (also called quiet delirium): 35% of patients who are diagnosed with delirium. Older age is predictor of hypoactive delirium .
  - mixed (fluctuation between hypo and hyper).: 64% of patients who are diagnosed with delirium.

Historical Perspective at NYP: CUIMC

- At New York Presbyterian Hospital, policy is that the nurse taking care of a patient in the MICU would assess their patient at least once per shift, report the findings to the health care provider and the on coming nurse.
- An educational offering was done in January 2012 by Nursing Education for all ICU nurses.
- Shortly there after, a similar offering was done for OT and Speech Language Pathology.
- Educational efforts for onboarding new nurses were also implemented.

What Do we Know about Delirium Assessment at NYP: CUIMC in 2016?

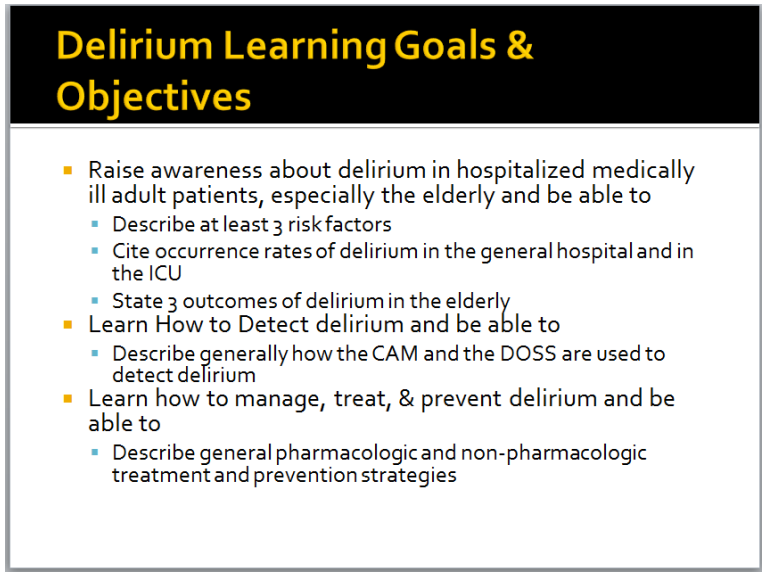
A retrospective chart review showed that delirium continued to be and under assessed and under addressed in our MICU.

Increasing Knowledge and Comfort in Performing the CAM-ICU

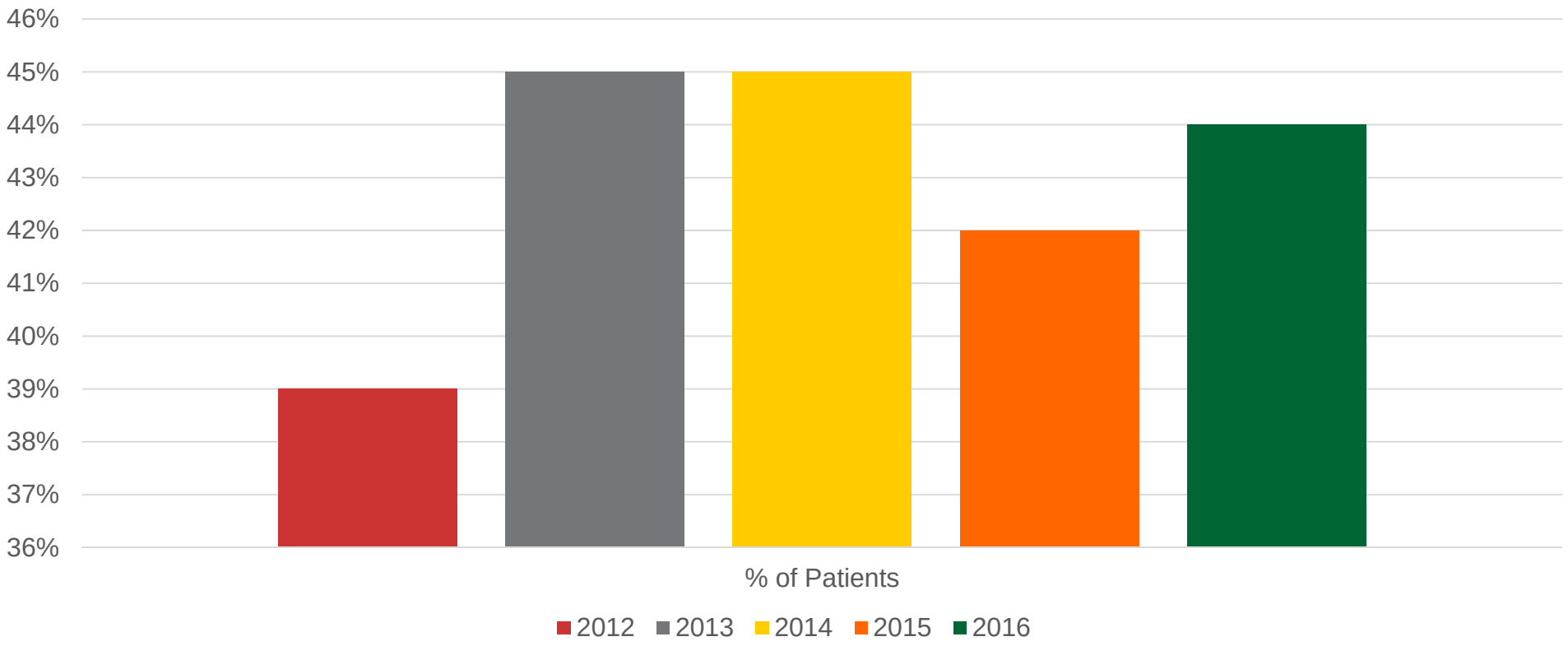
- Intensive day long program was held with an expert from Vanderbilt University to develop “Delirium Champions”.
- This group designed a three part educational intervention:
  - Didactic education on delirium.
  - Bedside education on the implementation of the CAM-ICU, with validation of clinical skills
  - Development of an interdisciplinary, non-pharmaceutical delirium bundle.

Development and Use of Non Pharmaceutical Bundle

- What did the Bundle consist of?
  - Family education re: delirium
  - Digital clocks with time and date
  - Large dry-erase calendars on wall
  - Sign with hospital name, city
  - Calming sensory environment
  - Availability of interpreter services
  - Music and TV



Percentage of MICU Patients Assessed for Delirium

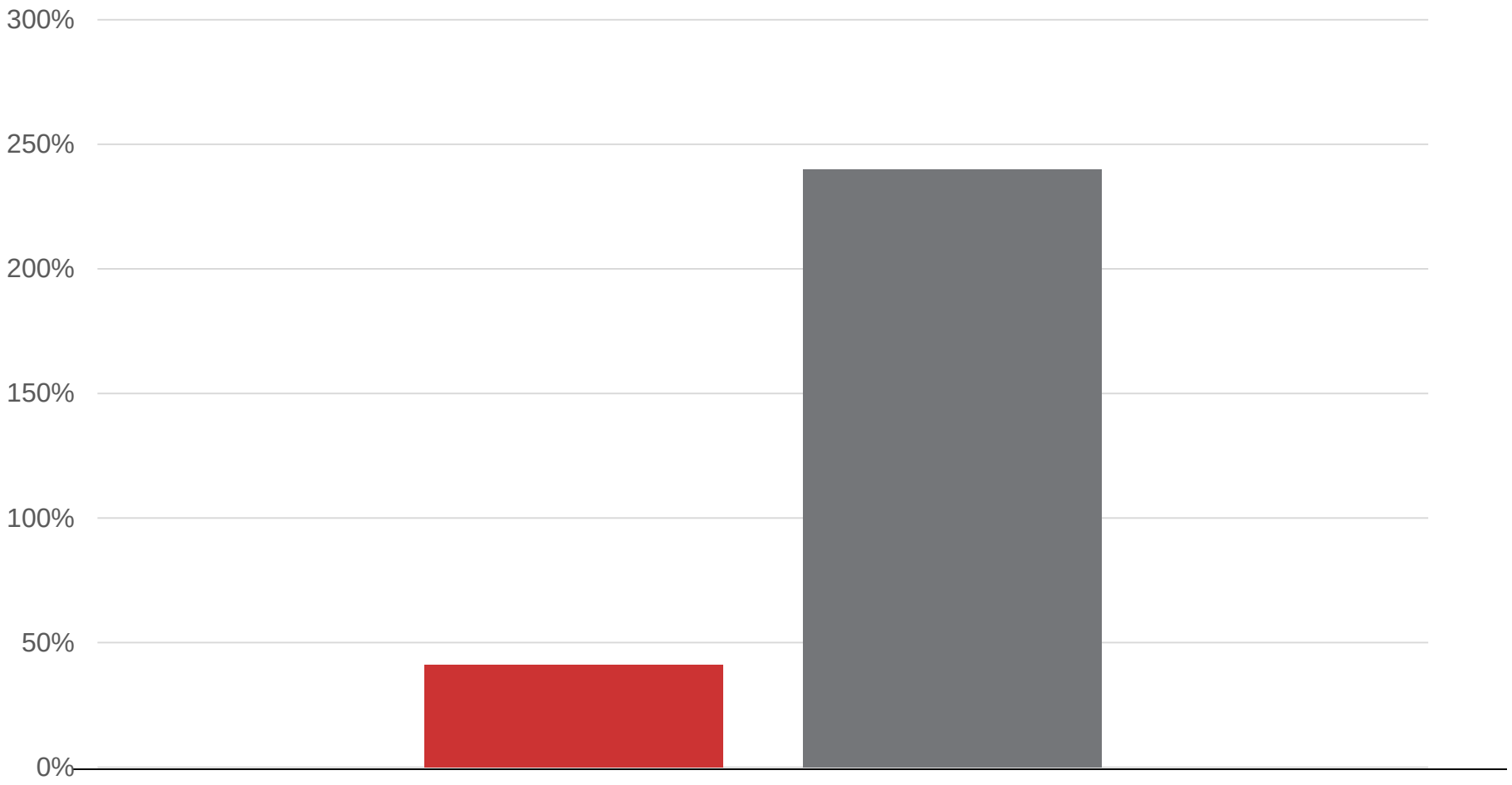


AMAZING THINGS ARE HAPPENING HERE

COLUMBIA UNIVERSITY MEDICAL CENTER

NewYork-Presbyterian Columbia University Medical Center

Nurses Self Reported Knowledge of the CAM-ICU



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Use of the Non Pharmaceutical Bundle

Data is still being analyzed.

Conclusion

The multi-faceted educational program increased the nurses in this MICU comfort level with utilizing the CAM-ICU and implementing interventions to assist in the management of delirium. We need to continue with increasing the utilization of the CAM-ICU throughout the team.

EARLY SPEAKING VALVE USE IMPROVES PATIENT OUTCOMES

Beth Sarfaty, PT, MBA; Amanda Dawson, PhD; Tessa Terwilliger, RN; Erica Hill, MPA; Elizabeth Hoffert, RN; Nancy Toms, SLP-CC; LoriAnn Kettler, RT; Samuel Hammerman, MD

Select Specialty Hospitals

Recovery from Critical Illness

Communication Challenges

- Estimated 790,257 hospitalized patients on mechanical ventilation (MV) annually[1]
- More than half of those patients may be awake/alert and have some capacity to communicate while on MV[2]
- Inability to communicate contributes to social withdrawal, anxiety, stress, poor sleep, and lack of participation in care[3]

1 Wunsch et al, Crit Care Med, 2010; 38: 1947-1953.
2 Happ et al, Heart Lung, 2015; 44: 45-49
3 Sutt et al, Crit Care, 2016; 20: 91.

Recovery from Critical Illness

Communication Challenges

Potentially eligible patients identified through billing data and further screened for being awake, alert, and attempting to communicate for at least one nursing shift, SPEACS-2 study 2009–2011.

Unit	Billing data[a]	EMR screened	Inclusion criteria not met	Assessed for "awake" criteria	Met "awake" criteria	Proportion
Transplant	1240	591	76	515	240	46.60%
NeuroTrauma	520	491	73	418	240	57.42%
Neurological	833	673	85	588	240	40.82%
Trauma	1064	410	67	343	240	69.97%
Cardiovascular	1014	397	49	348	240	68.97%
Medical	805	525	66	459	240	52.29%
Total	**5476**	**3087**	**416**	**2671**	**1440**	**53.91%**

[a] mechanical ventilation for >2 days, and first ICU admission during incident hospital stay; EMR – electronic medical record.

Happ et al, Heart Lung, 2015; 44: 45-49

Recovery from Critical Illness

Communication Challenges

"Being on the ventilator wasn't the worst thing in the world, but not being able to talk was horrid."

"I think my concern was that I wasn't able to call anybody to help."

"There would be times I would be flailing for somebody and they'd say, 'I'll be right back.' And you're like, 'No, you don't understand. I can't breathe right now. You need to help me right now.'"

Guttormson et al., Intensive Crit Care Nurs, 2015; 31: 179-186

Recovery from Critical Illness

Communication Challenges

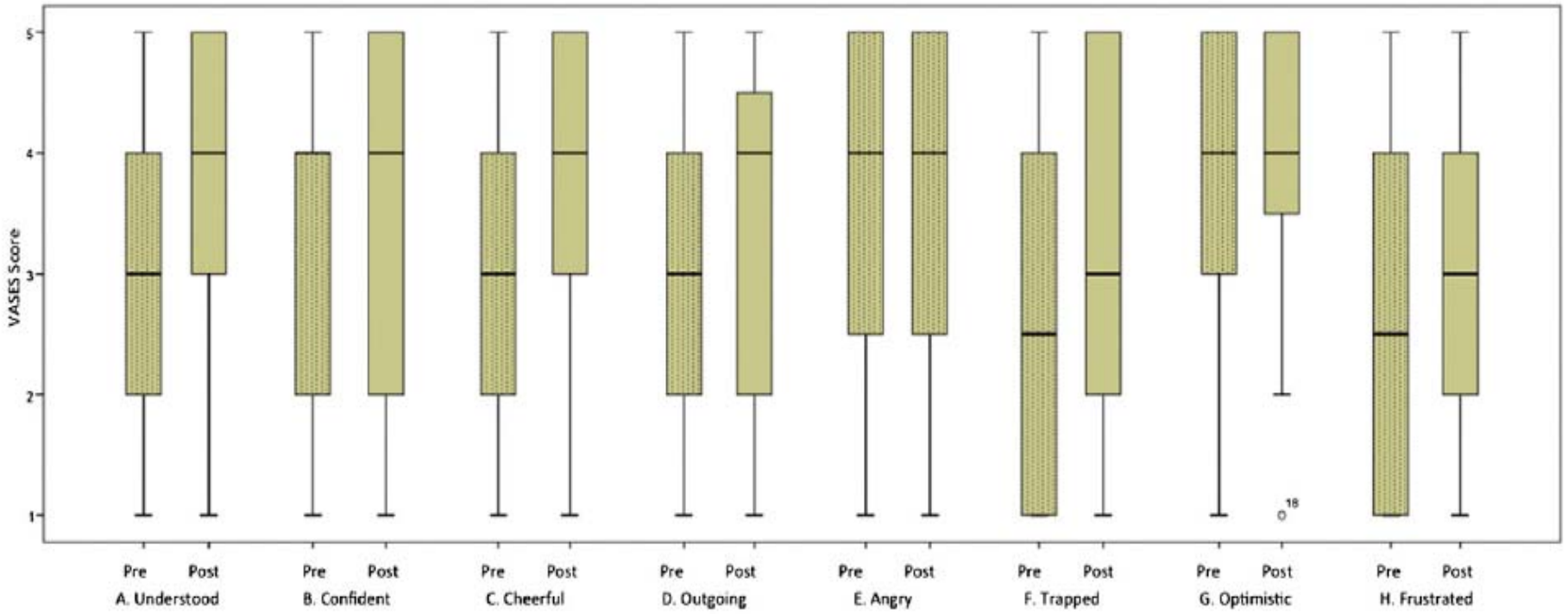


Fig. 2. VASES scores prevoice and postvoice.

Freeman-Sanderson et al., J Crit Care, 2016; 33: 186-191

Recovery from Critical Illness

Communication Challenges

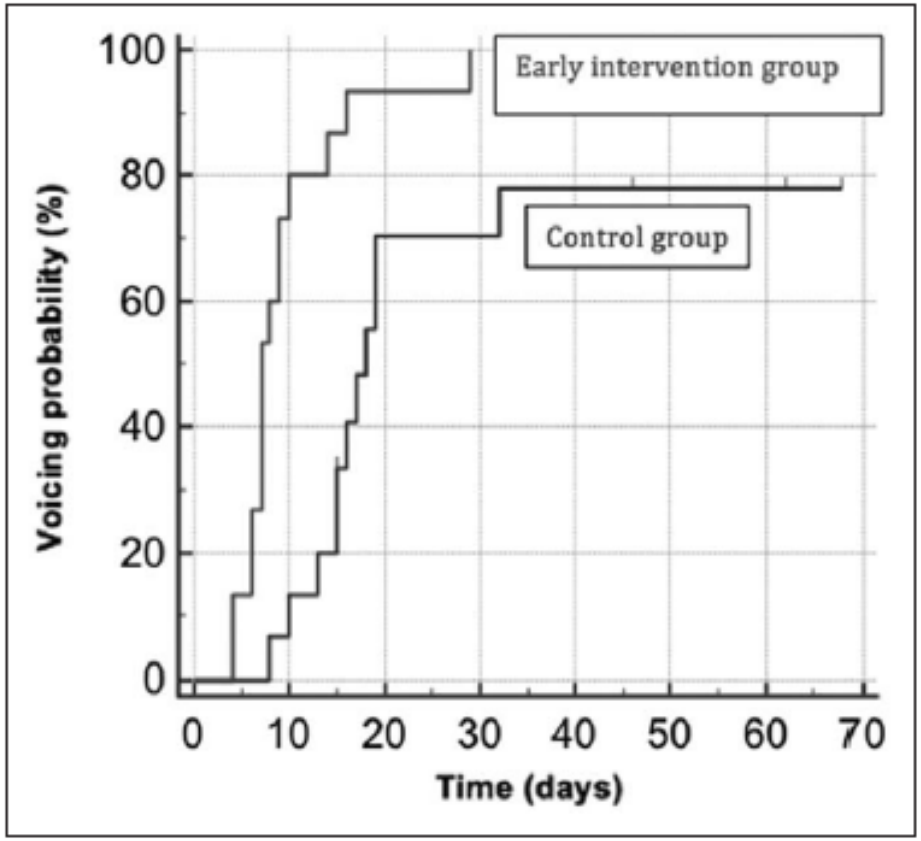


Figure 2. Time to phonation.

Freeman-Sanderson et al., Crit Care Med, 2016; 44(6): 1075-1081

Recovery from Critical Illness

Communication Challenges

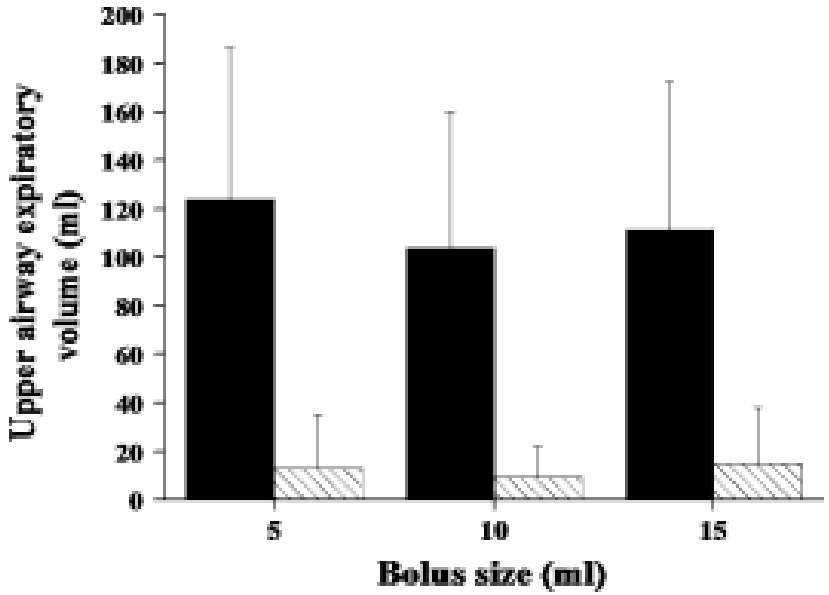
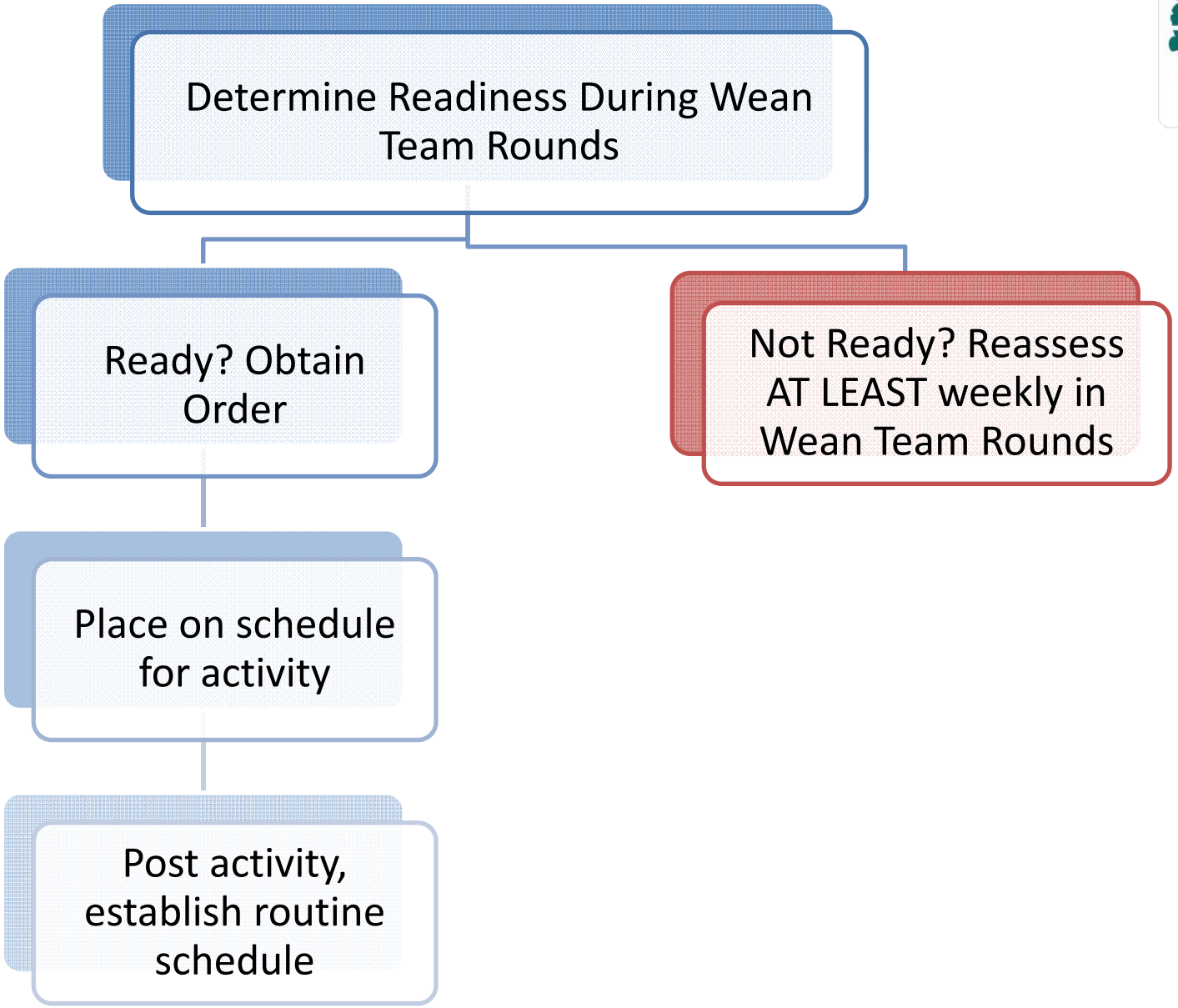


Fig. 2 Comparison of expiratory volume through the upper airway after swallowing each bolus size with (*black columns*) and without (*striped column*) a speaking valve (ANOVA; valve effect $p = 0.0003$; volume effect $p = 0.54$)

Prigent et al., Intensive Care Med, 2012; 38: 85-90

Project Goals

1. Multi-disciplinary assessment of ventilator patients' readiness to use an in-line speaking valve
2. Routine scheduling of speaking activities for ventilated patients
3. Consistent inclusion/exclusion criteria


Determine Readiness During Wean Team Rounds
Ready? Obtain Order
Not Ready? Reassess AT LEAST weekly in Wean Team Rounds
Place on schedule for activity
Post activity, establish routine schedule

Wean Team Progress Note

- Completed on all patients weekly as part of wean team
- Screened for readiness to ambulate/speaking valve

PULMONARY – WEAN TEAM
PROGRESS NOTE

Patient: _____
Medical Record #:_____

Date: _____ Time: _____

Wean team rounds conducted and the following has been identified:

_____No barriers to weaning, continue current plan of care

_____ Stalled wean or prolonged weaning due to the following:

__Copious Secretions __Sedation __Nutrition __Infection __Cardiac Instability __Fluid imbalance __Anxiety/ Depression

__Other:_____

Is patient a candidate for in-line Speaking Valve use? Yes___ No ___ NA ___ Actively tolerating Speaking Valve: _____

Is patient a candidate for ambulating with a transport ventilator? Yes ___ No ___ NA ___Actively tolerating Ambulation on vent:_____

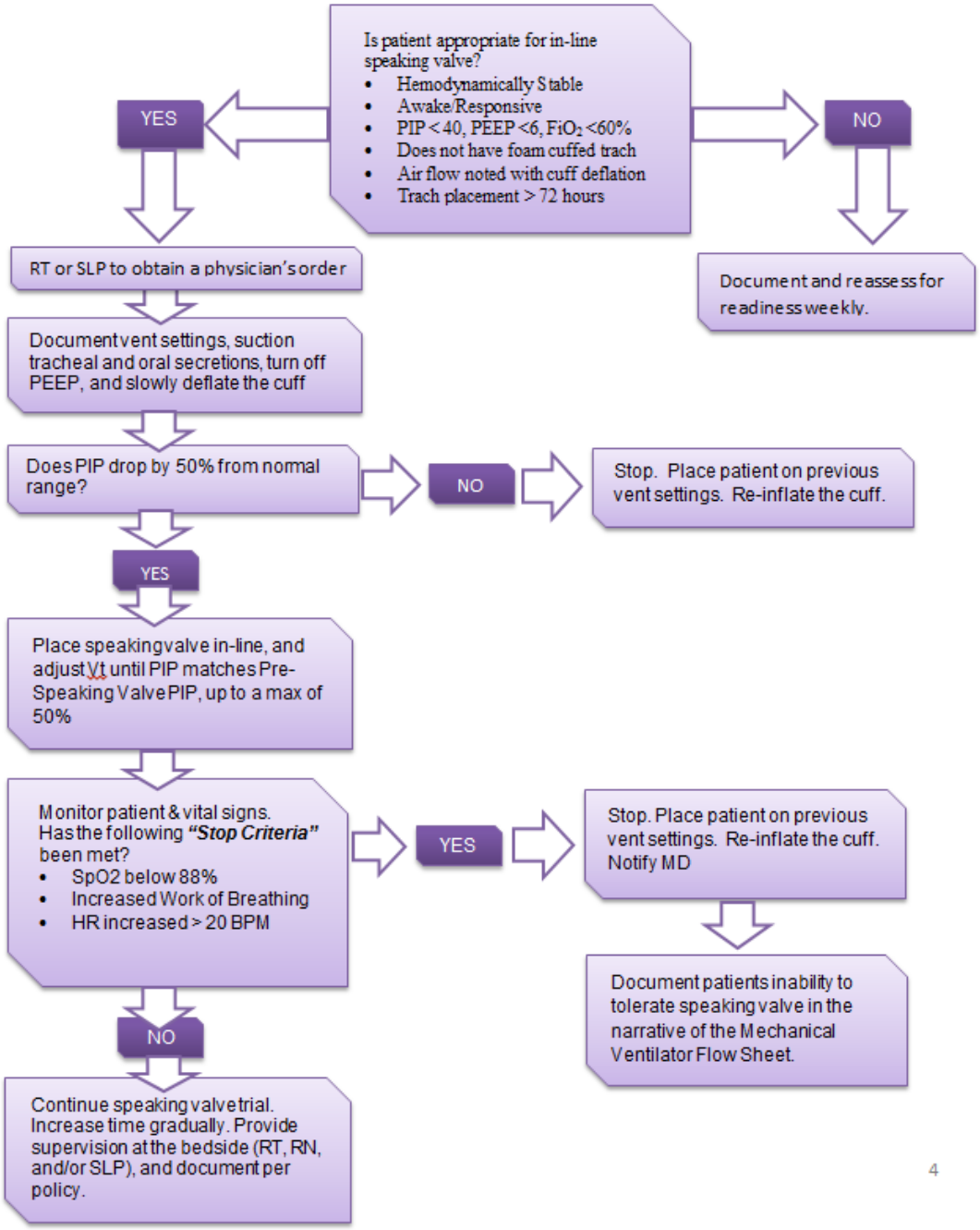
Plan to address identified barriers and/or new orders received:

_____

_____

_____

RT Signature: _____


Is patient appropriate for in-line speaking valve?
Hemodynamically Stable
Awake/Responsive
PIP < 40, PEEP <6, FiO2 <60%
Does not have foam cuffed trach
Air flow noted with cuff deflation
Trach placement > 72 hours
YES
NO
Document and reassess for readiness weekly.
RT or SLP to obtain a physician's order
Document vent settings, suction tracheal and oral secretions, turn off PEEP, and slowly deflate the cuff
Does PIP drop by 50% from normal range?
NO
Stop. Place patient on previous vent settings. Re-inflate the cuff.
YES
Place speaking valve in-line, and adjust Vt until PIP matches Pre-Speaking Valve PIP, up to a max of 50%
Monitor patient & vital signs. Has the following "Stop Criteria" been met?
SpO2 below 88%
Increased Work of Breathing
HR increased > 20 BPM
YES
Stop. Place patient on previous vent settings. Re-inflate the cuff. Notify MD
Document patients inability to tolerate speaking valve in the narrative of the Mechanical Ventilator Flow Sheet.
NO
Continue speaking valve trial. Increase time gradually. Provide supervision at the bedside (RT, RN, and/or SLP), and document per policy.

Speaking Valve

Patient Account No.: _____ **Patient Initials:** _____

	Candidate for speaking valve (Y/N)	If no, circle applicable barrier(s):
Week 1	Y N	1 2 3 4 5 6 7 8 9 10
Week 2	Y N	1 2 3 4 5 6 7 8 9 10
Week 3	Y N	1 2 3 4 5 6 7 8 9 10
Week 4	Y N	1 2 3 4 5 6 7 8 9 10
Week 5	Y N	1 2 3 4 5 6 7 8 9 10
Week 6	Y N	1 2 3 4 5 6 7 8 9 10
Week 7	Y N	1 2 3 4 5 6 7 8 9 10
Week 8	Y N	1 2 3 4 5 6 7 8 9 10
Week 9	Y N	1 2 3 4 5 6 7 8 9 10
Week 10	Y N	1 2 3 4 5 6 7 8 9 10

IN-LINE SPEAKING VALVE TRIAL	
Event	Date
First Pressure Support Trial	
First In-Line Speaking Valve Trial	
First Meaningful Communication	
Liberation from Ventilator	
Decannulation	
First PO Trial	
First Meal	

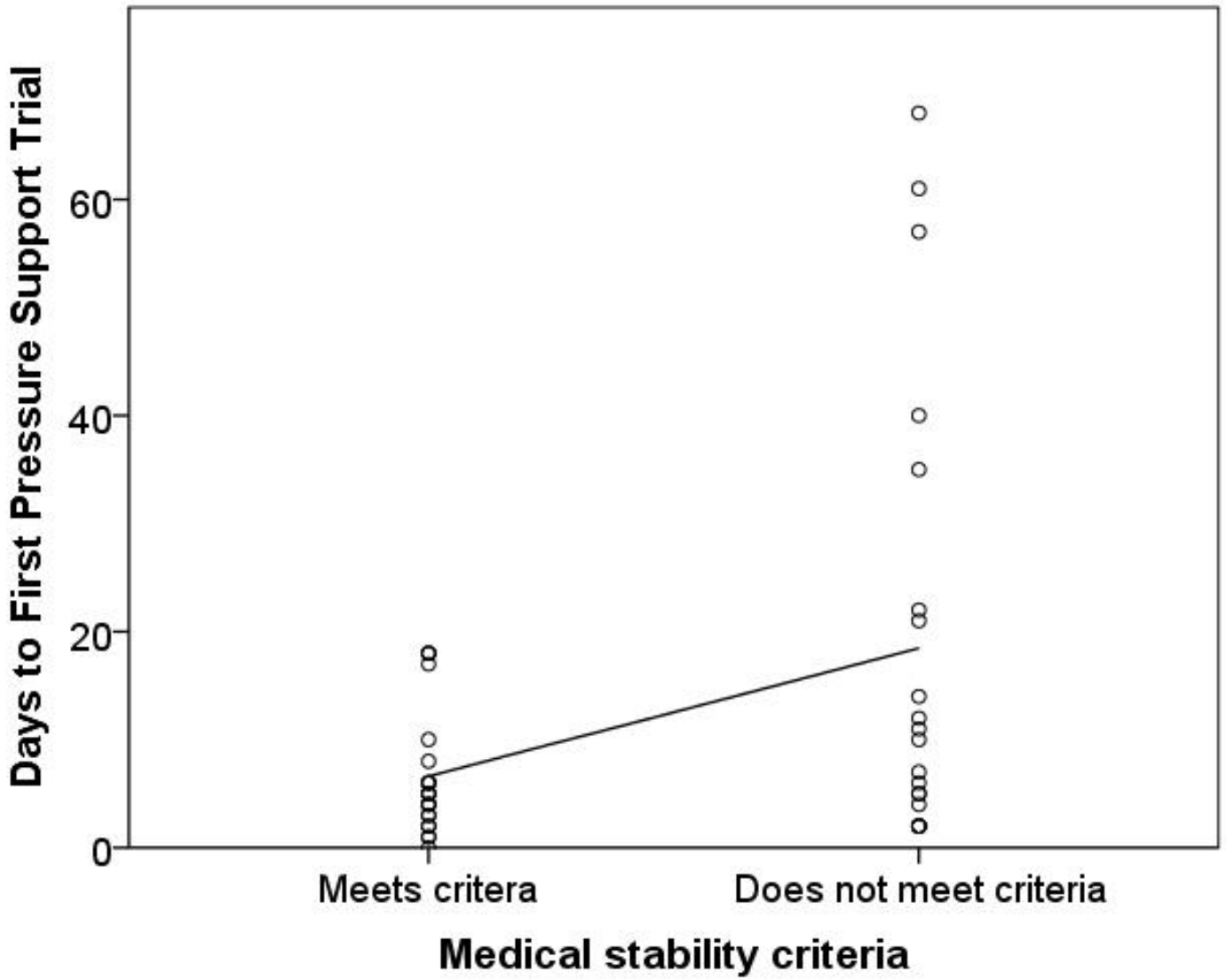
ADDITIONAL EVENTS	
Event	Date

ADVERSE EVENTS	
Date	Event
	1 2 3 4 5 6 7
	1 2 3 4 5 6 7
	1 2 3 4 5 6 7
	1 2 3 4 5 6 7
	1 2 3 4 5 6 7

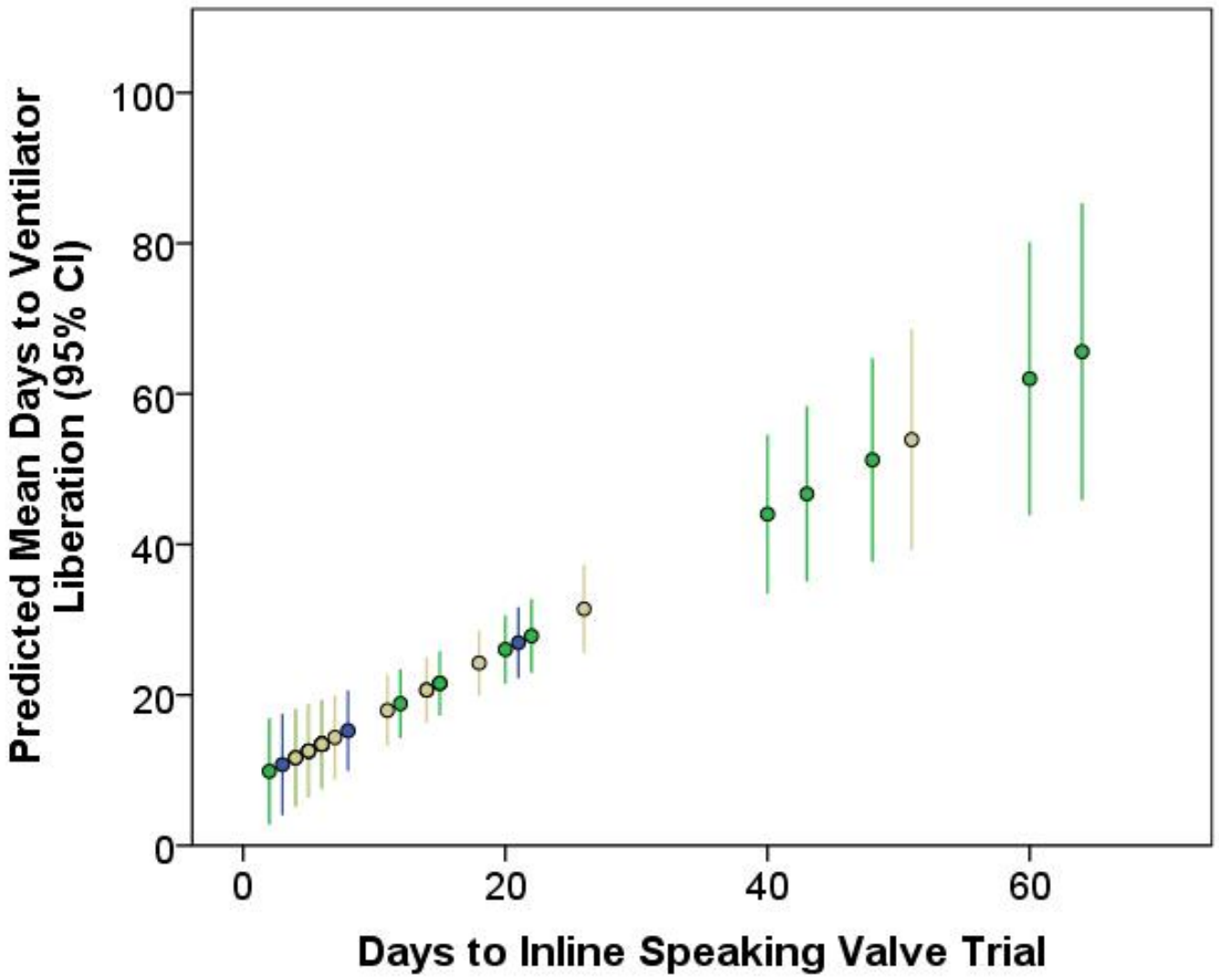
PERCEIVED BARRIERS	
1	Does not meet medical stability critieria
2	Bed rest orders
3	Patient on comfort/palliative care measures
4	Patient sedated
5	Level of consciousness
6	Patient unavailable
7	Patient declined
8	Patient is too weak to progress
9	Staffing
10	Other
11	Unknown

ADVERSE EVENTS (IN-LINE SPEAKING VALVE)	
1	Dislodgement
2	Cardiac Change
3	Respiratory Status Change
4	Wound or dressing disruption or bleeding
5	Aspiration
6	Death
7	Other

Results


Days to First Pressure Support Trial
60
40
20
0
Meets critera
Does not meet criteria
Medical stability criteria

Results


Predicted Mean Days to Ventilator Liberation (95% CI)
100
80
60
40
20
0
0
20
40
60
Days to Inline Speaking Valve Trial

Conclusions

1. Medical instability and weakness were more detrimental to speech-related functional goals than other identified readiness barriers.
2. Earlier assessment and completion of an in-line speaking valve reduced the time to ventilator liberation independent of patient acuity measures
3. The regular assessment of readiness and barriers to readiness may have a beneficial impact on functional milestones that are meaningful to patients on mechanical ventilation.

More Information:

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Amsterdam University of Applied Sciences

SURVIVING CRITICAL ILLNESS, WHAT IS NEXT?

An expert consensus statement on physical rehabilitation after critical illness

Mel Major-Helsloot
PhD candidate in post-ICU rehabilitation
European School of Physiotherapy
Amsterdam University of Applied Sciences
Dr. M. Van der Schaaf
Prof. Dr. R.H.H. Engelbert

Amsterdam University of Applied Sciences

CONTENT

- The bumpy road to recovery
- Research question
- Methods
- Results
- Further questions

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THE BUMPY ROAD TO RECOVERY: HOW CAN WE HELP?

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RESEARCH QUESTION

What are physical therapy goals, what are recommended measurement tools and what constitutes an optimal physical therapy intervention for survivors of critical illness?

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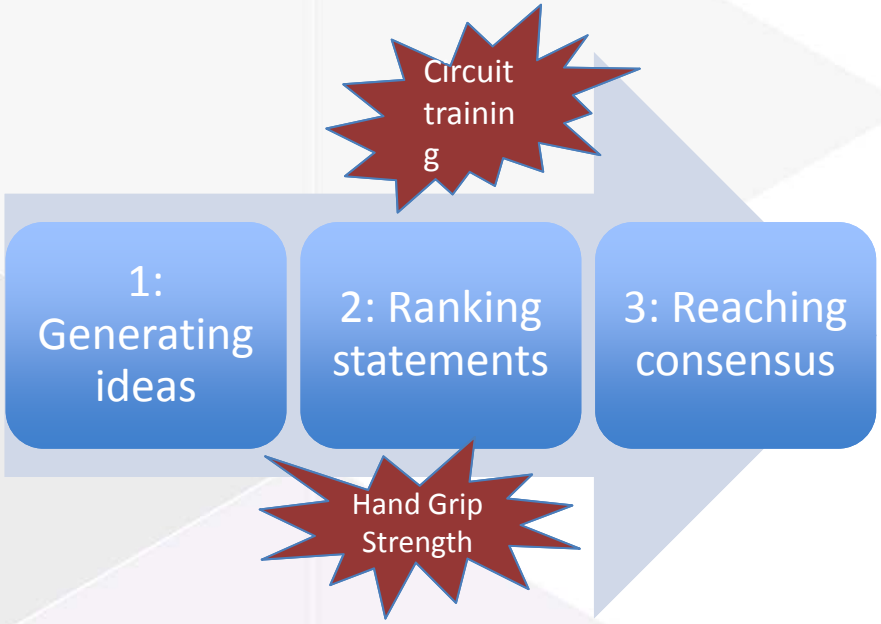
DELPHI CONSENSUS METHODOLOGY



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ESSENTIAL HOSPITAL DISCHARGE INFORMATION

Premorbid level of functioning
Course of recovery
Mental, cognitive, physical state
Delirium
ICU-Acquired Weakness
ICU & hospital length of stay
Severity of illness
Physiological response to exercise

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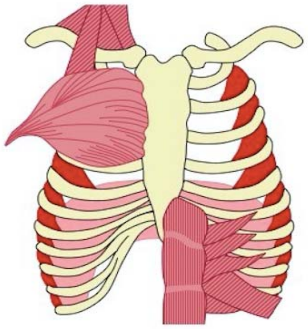
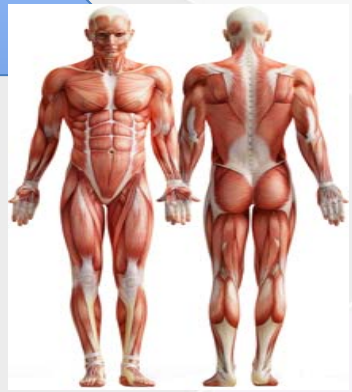
PT GOALS AFTER ICU & HOSPITAL DISCHARGE



-Aerobic capacity -Muscle strength
-ADL function
-Quality of Life
-Understanding of recovery process



- Pain

OUTCOME MEASURES TO USE

Core outcome set

- 6MWT, 4m timed walk/gait speed (SPPB)
- Sub-maximal cycle ergometry
- Handgrip strength or HHD
- MIP / MEP
- Spirometry / MRC Dyspnea scale
- Ultrasound / anthropometry
- KATZ-ADL or BI or Lawton's iADL
- SF36 or TUG or FIM or DEMMI or SPPB
- EuroQoL
- VAS (for pain)

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PT INTERVENTIONS

Combine strength training with nutrition (protein / amino acids)

Don't forget the respiratory muscles

Heyland et al (2015), Jones et al (2015)

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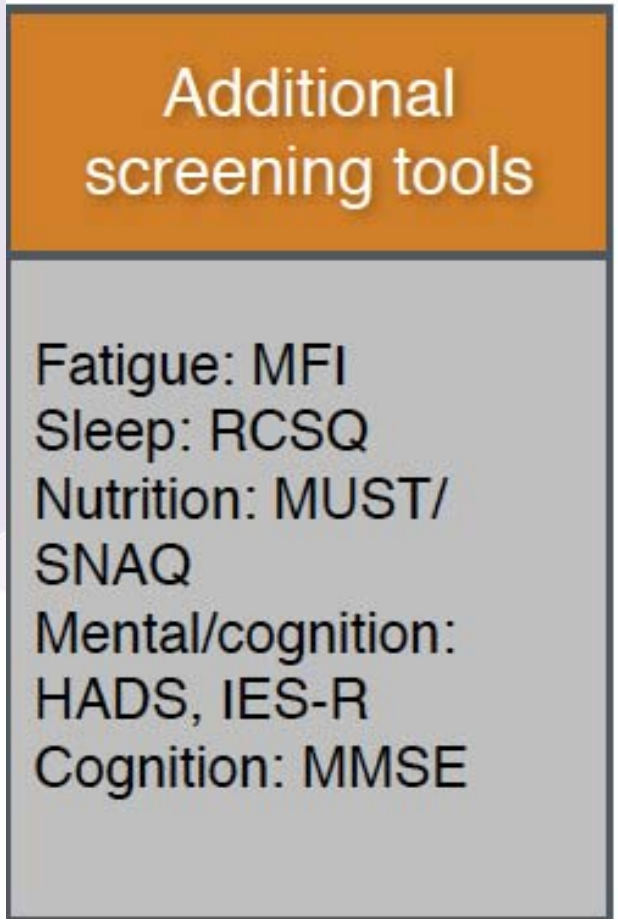
SCREEN FOR ADDITIONAL PROBLEMS



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CAN WE FILL THE POTHOLES IN THE BUMPY ROAD?

FURTHER QUESTIONS

- What are the needs and experiences of patients and caregivers with regards to recovery after critical illness?
- Is the proposed consensus framework feasible in primary care?
- Is such a PT intervention effective?
- Can we validate outcome measures for this specific population?

Amsterdam University of Applied Sciences

ACKNOWLEDGEMENTS

All members of the Delphi panel

ACHIEVE - Centre of Applied Research, Faculty of Health, Amsterdam University of Applied Sciences, Amsterdam, the Netherlands

European School of Physiotherapy, Faculty of Health, Amsterdam University of Applied Sciences, Amsterdam, the Netherlands

Academic Medical Center, University of Amsterdam, Department of rehabilitation medicine, Amsterdam, the Netherlands

This research is funded by the Netherlands Organization for scientific research (**NWO**)

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MORE INFORMATION

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Critical Care

RESEARCH Open Access

Surviving critical illness: what is next? An expert consensus statement on physical rehabilitation after hospital discharge

M. E. Major[1,2], R. Kwakman[1], M. E. Kho[3], B. Connolly[4], D. McWilliams[5], L. Denehy[6], S. Hanekom[7], S. Patman[8], R. Gosselink[9], C. Jones[10], F. Nollet[11], D. M. Needham[12,13,14], R. H. H. Engelbert[1,11] and M. van der Schaaf[1,11*]

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Mobility in the Critically Ill Pediatric Patient on ECMO Support

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JOHNS HOPKINS
MEDICINE

Objective

- Describe ICU mobility within the context of safe-patient handling in regard to the pediatric patient on ECMO support
  - Briefly discuss the results from the chart review
    - Identify current mobility practice
    - Incidence of pressure injuries (PIs)
    - Proportion of Physical Therapy (PT) and Occupational Therapy (OT) consults and interventions
  - Brief discussion of guidelines as implemented in the QI project

Introduction

- ECMO has been used for more than 2 decades in the neonatal, pediatric and adult intensive care units to treat cardio-respiratory dysfunction/failure which has been unresponsive to conventional medical therapies.

Background

- **Safety concerns**
  - Cannula dislodgment: life threatening
  - Patient illness and tolerance to movement
- Prolonged immobility while on ECMO support
- Adequate management of pain and sedation
- Costs related to physical therapist and Occupational therapist dedicated to the PICU

Consequences of Prolonged Immobility

- Pressure injuries
- Critical illness myopathy
- Prolonged hospitalization
- Increase in cost and economic burden
- Poor functional outcomes
- Decrease in family satisfaction

Risk factors: Pressure injuries

- Risk factors
  - Assisted ventilation
  - PICU stay > 4 days
  - Inotropic support
  - Cardiac arrest/cardiac surgery
  - ECMO
  - Weight loss
  - Immobility (no change in body position)
  - Nutritional deficits
  - Marked edema
  - Exposure to prolonged pressure from devices
- Body proportion of children
  - Infants and younger children: OCCIPUT
  - Older Children - Sacrum

Risk Factors: Therapeutic Interventions

Table 1
Multiple logistic regression models of risk factors in the pediatric intensive care unit

Risk factor	Odds ratio	95% confidence interval	P
Age ≤2 y	1.091	0.886 - 1.343	.41
Stay ≥4 days	5.684	4.481 - 7.21	<.001
Bilevel or continuous positive airway pressure	2.004	1.509 - 2.661	<.001
Mechanical ventilation	1.334	1.031 - 1.726	.03
High-frequency oscillatory ventilation	2.057	1.142 - 3.704	.02
Extracorporeal membrane oxygenation	2.490	1.208 - 5.134	.01
Pediatric Index of Mortality 2 score	1.132	1.055 - 1.215	<.001
Site variable (dummy variable)	NA	NA	<.001

Abbreviation: NA, not applicable.

Financial Costs of Pressure Ulcers

- More than 2.5 million people in the USA develop pressure ulcers
- Pain, associated risk for serious infection, increased health care utilization
- Cost of pressure ulcers
  - $9.1 – $11.6 billion per year in the USA
  - Individual patient: $20,900 to $ 151,700 per pressure ulcer

Berlowitz D, et al. AHCPR Publication No. 11-0053-EF ; US Department of Health and Human Services; 2013

Feasibility of Early Physical Therapy

Table 3. Implemented Physical Therapy Sessions for Patients on ECMO Support and Vital Signs As Well As Safety Events During Sessions

	Received PT Sessions					
	Total	EMS and PROM	Sitting	Strengthening (Elastic Band)	Standing or Marching in Place	Walking
Number of sessions	62	31 (50%)	17 (27.4%)	2 (3.2%)	11 (18%)	1 (2%)
Vital signs after PT						
Systolic blood pressure (mm Hg)	130.4±24.7	121.6±21.6	136.7±31.3	135.5±32.3	143.3±43.1	181
Arterial oxygen saturation (%)	94.9±4.9	94±4.9	97.31±7.3	91±4.2	94.4±4.4	100
Respiratory rate (per minute)	24.9±4.9	21.2±1.2	26.3±6.3	34±4.2	30.9±0.9	28
Heat rate (per minute)	100.9±0.9	97.1±7.1	106.5±6.5	108±0.8	106.2±6.2	57
PT interruption	0	0	0	0	3 (5%)	0
Causes						
Tachycardia	0	0	0	0	1 (2%)	0
Tachypnea	0	0	0	0	2 (3%)	0

Values were mean ± SD or sessions (%).
PT, physical therapy; EMS, electrical muscle stimulation; PROM, passive range of motion.

Examples of Mobilizing Adult Patients

Ko et al. 2015, ASAIO Journal

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Trends in Participation in Physical Therapy

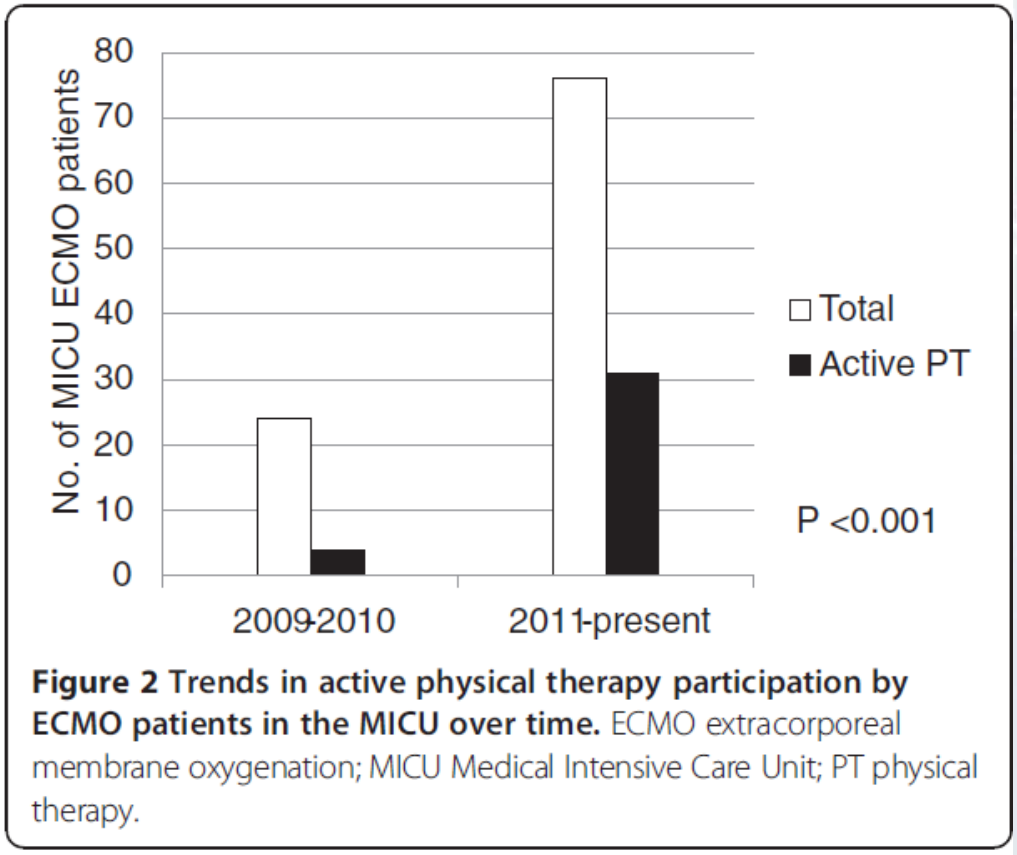

Figure 2 Trends in active physical therapy participation by ECMO patients in the MICU over time. ECMO extracorporeal membrane oxygenation; MICU Medical Intensive Care Unit; PT physical therapy.

Abrahams et al. 2014, Critical Care

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Infant on ECMO Support

Method

- Single center retrospective chart review from July 2011 to June 2017
  - Identify the mobilization practice
  - Incidence of pressure ulcers in the patients on ECMO support
  - Proportion of OT and PT consults to the proportion of OT and PT interventions
- Collaboration with PICU UP! quality initiative project to improve early mobilization in critically ill children

Patient Demographics & ECMO Data

Total charts reviewed: N=150	
Age	Range: 0 days - 21.82 years old
	Median: 1.53 months
Newborn (0 - 30 days)	70 (46.6%)
Pediatric (1month - < 18 years)	77 (51.33%)
Adult (> 18 years)	3 (2%)
Hours ECMO support	Range: 1 to 1336 hours
	Median: 115 hours
	Average: 364.36 hours
Mode of ECMO support	VA: 139 (92.8%)
	VV: 11(7.33%)
Cannulation sites	Neck: 109 (72.6%)
	Femoral vessels: 16 (10.66%)
	Transthoracic: 25 (16.66%)
ECPR	61 (40.66%)
Elective cannulation	89 (59.33%)
Decannulation/ 2 week post ECMO survival	99 (66%)

Summary of PIs, PT & OT Data

	Total Charts Reviewed (N= 150)	Patients Decannulated (N= 99) 2 weeks post ECMO support
Pressure Ulcers identified	10 (6.66%)	39 (39.39%)
Location of Pressure Ulcers	**n=10**	**n=39**
Occiput	3(30%)	22(56.41%)
Heels	3(30%)	9(23.07%)
Ears	2(20%)	2(5.1%)
Sacrum	3(30%)	10(25.6%)
Upper Back/Nape of neck/Scapula's	1 (10%)	13(33.33%)
Consults: Skin/wound	22 (14.66%)	42 (42.42%)
Plastics		9(9%)
Derm		1(1%)
GPS		2 (2%)
Position/Repositioning	150 (100%) Flat & Supine	99 (100%) repositioned with HOB elevated range of 10 to 30 degrees
Occupational Therapy (OT) Consults	74 (49.3%)	66(66.66%)
OT Interventions:	**n = 74**	**n = 66**
Positioning	9 (12.1%)	29 (43.9%)
Splints	6 (8.1%)	8 (12.12%)
ROM	13 (17.5%)	21 (31.8%)
ADLs	0	22 (33.33%)
Physical Therapy PT) consults	37 (24.6%)	33 (33.33%)
PT interventions:	**n = 37**	**n = 33**
PROM	6 (16.2%)	7 (21.21%)
AROM	0	16 (48.48%)
Positioning	0	2 (6%)
Sitting	0	2 (6%)
OOB	0	2 (6%)
Active mobilization	2 (5.4%)	NA

Strategy: Implementing Evidence

- Identified guidelines
  - ECMO skin protection and repositioning bundle
- Collaboration with PICU UP! work group
  - Align progressive mobilization with the PICU UP1 levels
- Revised and update current policies associated with the nursing care and management of the ECMO patient
- Staged approach at implementing the interventions
- Post implementation
  - Rounding sheet
    - Coaching and supporting bedside RN and ECMO specialist
    - Ongoing data collection

ECMO Skin Protection & Repositioning Bundle

PICU UP! Early Mobilization

Pre-ECMO

- Appropriate mattress: Sizewise gel infant mattress, VersaCare mattress with gaymar overlay
- Minimize linen layers: 1 Sheet ± absorbent layer
- Mepilex Border Lite to Occiput or Mepilex Border to Sacrum
- Z-Flow positioner placed under the head
- Undo all hair braids
- Heels: float heels and/or heel protector boots
- NOTE: The earlier the better! Implement pre-ECMO interventions for all critically ill patients at risk for ECMO

Immediate Post ECMO Cannulation

- Encourage surgeon to apply Mepilex Lite between skin and cannula
- Bleeding at site: Apply Stat Seal hemostatic powder
- Assess Cannula position
- Coordinate plan to remove shoulder roll
- Positioning: align head and body
- Consults: OT/PT; wound/skin; Nutrition; Other

Ongoing ECMO Support

- Remove shoulder roll within 24 hours post cannulation
- Ensure continued head/body alignment
- Repositioning Q2 hour
- Skin assessment Q shift
- Change mepilex Q7 days
- Policies: GEN044, PICU065, & PICU011

PICU UP! Levels

Step 1-Screening Process: Early Activity and Mobility Levels

These are the criteria for inclusion at each level of the screening process.

LEVEL 1: Parameters for Inclusion	LEVEL 2: Parameters for Inclusion	LEVEL 3: Parameters for Inclusion
• Intubated with FiO2 >60% *or* • Intubated with PEEP > 8 *or* • Intubated difficult airway *or* • New tracheostomy *or* • Acute neurological event *or* • Sedated and SBS -3 to –2 *or* • Vasopressor other than Milrinone	• Intubated or tracheostomy with FiO2 ≤ 60% +/or PEEP ≤8 *and* SBS -1 to +3 *or* • Noninvasive respiratory support with FiO2 > 60% *or* • Dialysis/Renal Replacement Therapy *or* • Femoral access	• Non-invasive respiratory support with FiO2 ≤ 60% *or* • Baseline pulmonary support *or* • EVD cleared by NUS *and* SBS -1 to +3

PICU UP! Levels and Activities

PICU UP! Level	Parameters for Inclusion	Activities	Criteria to Pause Activity, rest and reassess

Level 1ECMO	• VV or VA ECMO: femoral or neck cannulation
	• Stable and secure ECMO cannula
	• Stable hemodynamics with stable ECMO flows, stable inotropic support
	• No significant bleeding
	• Stable SVO2
		• Lights on/shades up by 0900
		• Bed/bath/weight by 2300
		• Lights dimmed/out by 2300
		  o Increase lighting as needed for cares/interventions
		• TV limited to 30 minutes at a time and a goal of <2 hours per day for children >2 years of age
		• HOB elevated ≥ 30°
		• Turn q2h during the day and q4h at night
		• OT and PT consulted on ECMO initiation
		• Maintain head and body alignment during activity and/or repositioning
		  o PROM as per discussed by PICU team
		• Positive touch for infants and toddlers
		• pCAM or psCAM assessment BID if SBS -1 to +3
			• Decrease in SvO2 by 20% of baseline or SvO2 < 50%
			• Decrease in NIRS by 20% from baseline
			• New arrhythmia or ST changes
			• Reportable conditions to provider
			  • Increase in bleeding around cannula site and/or general increased bleeding
			  • Persistent changes to ECMO flow or pump pressures

Limitations

- Single center study
- Retrospective chart review
  - Documentation
    - limitations

Conclusion

- ECMO increases the risk for development of pressure injuries due to due to prolonged immobility
- Multidisciplinary team
  - Promote education and support staff to safely facilitate and improve early mobilization activities of the critically ill pediatric patient on ECMO support
  - Daily assessment and discussion on rounds regarding activity level for the patient
- Aligns with **ABDCEF ICU liberation bundle**
- **Goal**
  - Reduce the incidence of pressure injuries and increase OT and PT interventions to promote early rehabilitation

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WHEN THERE AREN'T ENOUGH PEOPLE

Use of Safe Patient Handling and Mobility Technologies to Promote Mobility across all Disciplines and Levels of Mobility

Margaret Arnold, PT, CEES, CSPHP

6th Annual Johns Hopkins ICU Rehab Conference

November 3, 2017

OBJECTIVES

Understand	Understand the risks and limitations of manual assistance for weak and dependent patients
Discuss	Discuss the role of Safe Patient Handling and Mobility devices in helping overcome some of the barriers to EM
Discuss	Discuss how Safe Patient Handling Devices can be used to promote mobilityIdentiy
Integrate	Integrate progression and regression of activities using SPHM devices

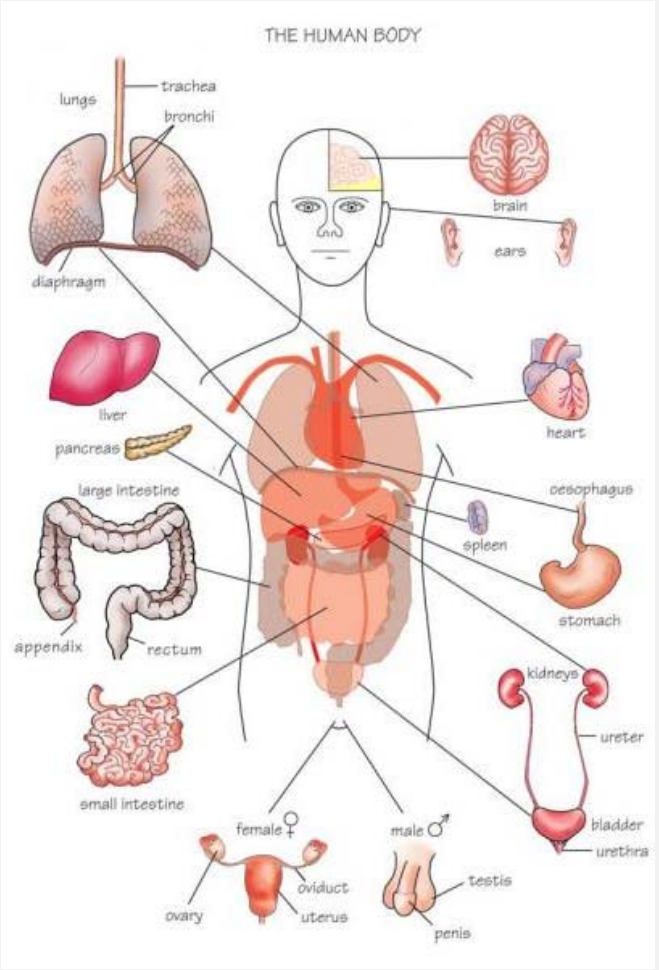
DISCLAIMER

- I want to emphasize that I am NOT endorsing any particular piece of equipment you see in the videos. The videos represent the equipment that I have access to, and have been provided by various vendors. I strongly encourage you to visit the vendor area and compare and contrast the solutions for yourselves. There are more than one version of all the solutions you will see in the videos today. The objective today is to provide ideas and a variety of examples of how to mobilize even the most challenging patients, and how to do so safely, through incorporating SPHM technologies into your EM programs.

  - Margaret Arnold, PT, CEES, CSPHP.

SMALL STEPS LEAD TO LARGE GAINS

- Mobility includes all activities that challenge the heart, lungs, brain, muscles, circulatory, and other systems to respond and work.
- Ultimate Goal is Functional Mobility
- Never underestimate the physiological or the psychological value of small mobility steps from one level to the next.



PATIENT MOBILITY CANNOT BE AT EXPENSE OF CAREGIVER SAFETY

- Each day, the average nurse lifts the equivalent of a mid-size car with 4 people in it through their spine
- Evidence shows that injured caregivers change their treatment interventions, favoring more in-bed activities

when moving and lifting 4 to 5 patients
with an average weight of 200lbs
every 2 hours in an 8 hour shift

Every day

NEVER DO FOR A PATIENT WHAT THEY CAN DO FOR THEMSELVES

"Always remember, when we do for the patient what they can do for themselves, we deprive them of an opportunity to mobilize and we make them weaker"

Mobility Clips using SPHM devices

SUMMARY

SPHM technologies can PROMOTE patient mobilization.

Patients should always actively participate to the extent possible

The objective today was to provide a variety of examples of how to mobilize even the most challenging patients safely, through incorporating SPHM technologies into EM programs.

SPHM can help overcome barriers such as not enough people, patient fear, certain precautions, and can enable you to mobilize the greatest number of your patients to the highest level that they are capable of, without fear of injuring yourselves in the process.

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QUESTIONS

Contact Information

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Implementation of a PICU Early Mobilization Program

Bettina Di Franco, OTR/L, C/NDT

November 3, 2017

Weill Cornell Medicine
Pediatrics

NewYork-Presbyterian
Phyllis and David Komansky
Children's Hospital

Background

- Critically ill patients are at risk for significant morbidity
- Some evidence in support of EM in the pediatric critical care community, EM is not yet widely adopted
- Limited institutional mobilization of PICU patients on Positive Pressure Ventilation
- The early mobilization (EM) of critically ill adults has been shown to be safe and feasible, with numerous wide ranging benefits

Objective

- Using results from a literature review and institutional survey, we developed and implemented a Pediatric EM program, evaluating feasibility and safety.

Methods

- Beginning January 2016, a multidisciplinary team was established
- Survey data was collected assessing baseline knowledge surrounding EM
- Screening and implementation tools were created
- Tools vetted and approved by multiple disciplines

Inclusion / Exclusion Screening Guide:

Weill Cornell Medicine Division of Pediatric Critical Care Medicine Early Mobilization Inclusion/Exclusion Screening Guide:

Inclusion Criteria: All patients >3 are eligible for early mobilization. Each of these patients should be assessed for any exclusion criteria below. If none are met, **confirm eligibility with fellow/attending.**

Exclusion Criteria:

Equipment:
-Presence of femoral hemodialysis catheter
-EVD in patient with need for ongoing ICP management
-Open lumbar drains

Respiratory:
-Known history of difficult airway
-Unstable airway (tracheal reconstruction, fresh tracheostomy)
-Requiring FiO2 >50%
-PEEP > 8
-Alternate modes of ventilation: High frequency ventilation (oscillator), BiLevel (APRV)

Cardiovascular:
-Hemodynamic instability as defined by:
    -Requirement of continuous infusion of vasoactive medications,
    -OR signs of hypoperfusion including elevated lactate
-Uncontrolled arrhythmias

Neurologic:
-Known or suspected elevated intracranial pressure
-Uncontrolled seizures
-Patients with RASS < -2
    → Please discuss lightening sedation with primary team, unless deep sedation targeted as part of medical management

Surgical:
-Open surgical sites (chest, abdomen)
-Immobilization requested per surgical team

Hematologic:
-Known active/uncontrolled bleeding
-Platelets < 10,000

Renal:
-Any patient actively receiving continuous veno-venous hemofiltration (CVVH)

Limitations:
-For patients with RASS score > +2 in previous 2 hours, limit mobilization to at most sitting up in bed
    → Speech therapy/occupational therapy/child life may work unrestricted with these patients

EM Checklist
(Pre / Post - EM)

PICU Early Mobilization (PEM) Checklist:

Date: _____ EM Start Time: _____
Medications given as prep for session: _____

Before Early Mobilization: Completed by RN & Rehab immediately before mobilization

Nursing:
[ ] All members of team available (RN, RT, Rehab)
[ ] Endotracheal tube secure (if applicable)
[ ] Airway bundle filled out
[ ] Airway box available at bedside
[ ] RASS >-3 and <+3 in preceding 2 hours: RASS score: _____
[ ] Pain assessed & treated prior to mobilization (if appropriate)
[ ] Pain score pre-EM: _____ [ ] Pain medication given: [ ] Yes: _____ [ ] No
[ ] Family prepped (by RN, CL, or MD)
[ ] Peripheral IVs secured & lines untangled
[ ] Central lines dressed appropriately & secured (2 points of attachment)
[ ] Appropriate monitoring (transport monitor if applicable)
[ ] Wheelchair available to follow patient (if mobilized OOB)
[ ] Fellow/attending readily available for adverse respiratory event (i.e. unplanned extubation)
Name of MD notified prior to PEM: _____

Respiratory:
[ ] Endotracheal tube secure (if applicable)
[ ] Airway treatments given prior to EM (i.e. albuterol)
[ ] Suctioned prior to mobilization
[ ] FiO2 increased by 10% (to not more than 60% FiO2)
[ ] ETCO2 monitoring (if mechanically ventilated)
[ ] Equipment readily available (transport ventilator and ETCO2)
[ ] BiPap mask secure (if applicable)
[ ] Level of respiratory support: [ ] Ventilator [ ] BiPap [ ] CPAP [ ] HFNC [ ] Conventional NC
[ ] Settings: _____

During Session

[ ] Pain score: _____ Pain meds given: _____ Scale Used: _____
[ ] RASS score: _____

Weill Cornell Medicine Pediatrics

NewYork-Presbyterian Phyllis and David Komansky Children's Hospital

After Mobilization: Completed by RN & Rehab immediately after mobilization

EM End Time: _____
Duration of active EM (in minutes)? _____
If OOB (ex. OOB to chair) – Duration (in minutes)? _____

Who was present for early mobilization?

[ ] Bedside nurse
[ ] Respiratory therapist (how many: _____)
[ ] Occupational therapist (how many: _____)
[ ] Attending
[ ] Child Life
[ ] Other: _____
[ ] Additional nurse (how many: _____)
[ ] Physical therapist (how many: _____)
[ ] Fellow
[ ] Resident/PA
[ ] Family members (how many: _____)

Early mobilization performed?

[ ] Activities in bed Description: _____
[ ] Activities OOB Description: _____
[ ] Ambulating Description: _____
[ ] Communication Can patient communicate? [ ] Yes (Refer to SLP) [ ] No

Adverse events? (Check all that apply and describe)

[ ] None
[ ] Removal of IV
[ ] Desaturation (oxygen saturation < 85%)
[ ] Increased pain
[ ] Removal of central catheter
[ ] Unplanned extubation

[ ] Hemodynamic changes (sustained change in HR or BP) or other events, please explain below:
_____

Scores immediately following EM

[ ] Pain score: _____ Pain meds given: _____ Scale Used: _____
[ ] RASS score: _____

Did mobilization result in referral to another discipline? [ ] Yes [ ] No
Discipline: _____ (ex. Speech Language Pathology-SLP- for communication needs)

Feedback post EM session

Family: _____
RN: _____
RT/PT/OT: _____
MD/PA: _____

So how did we go from identifying the patient to mobilizing the patient???

PICU "I See You" in Motion Process Map

How did we mobilize?

- Begin slowly, use positive touch and a calming voice
- Talk your patient through the process no matter your patient's level of alertness (encouragement for both patient and family present)
- Continuously observe and monitor your patient as well as the environment around you

Mobilization continued….

- Minimize visual clutter or amount of people around to maintain calm state (i.e. reduce sensory overload)

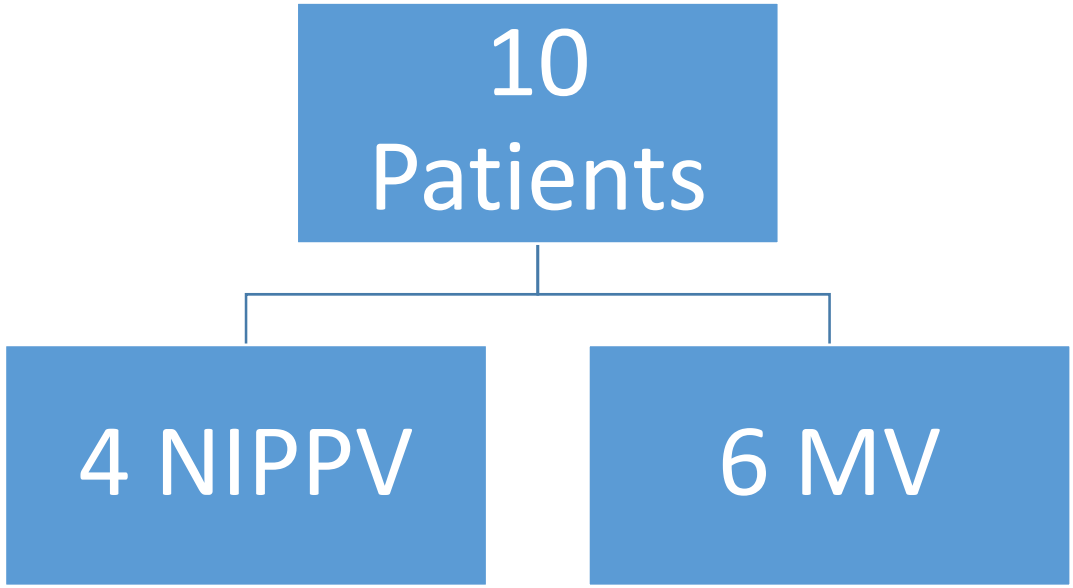
- If high anxiety, help your patient move one limb at a time to help them gain confidence and trust in the process

- Mobilize in steps appropriate to the patient's response (i.e. sitting up with support & monitoring response before incorporating EOB or standing, etc.)

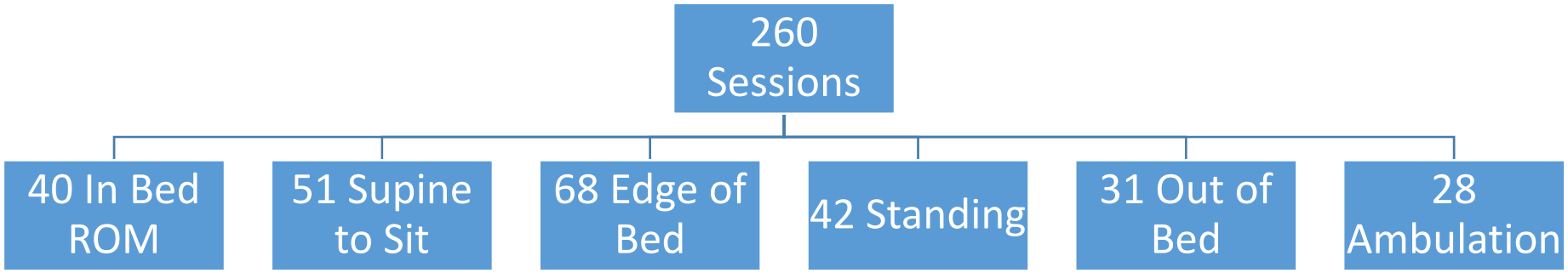
Mobilization continued….

- After mobilization, briefly summarize what was accomplished to both patient and family
- Provide a simple program for family to carry over throughout the day (i.e. ROM, touch, communication, etc.)
- Briefly huddle post session with bedside team as to what worked and what didn't for carry over and for future mobilization sessions with team

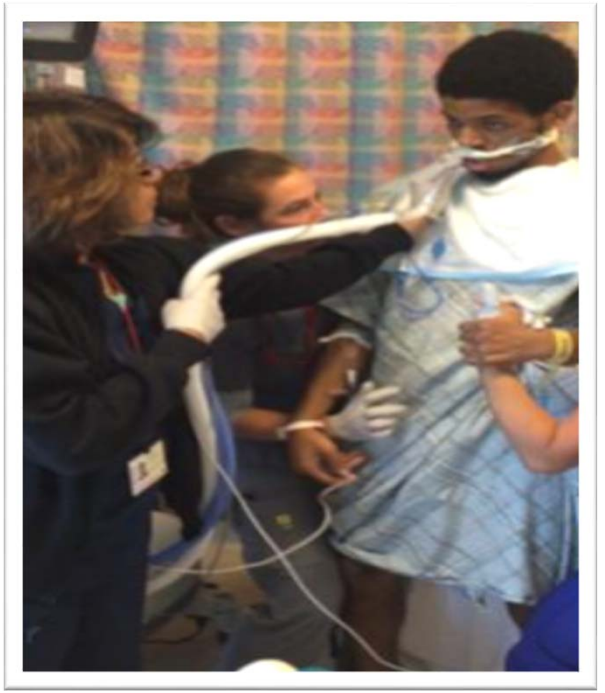
Results



Results:



No adverse events were recorded, either on paper records, or in our hospital's event reporting system (KEEPSAFE)



"It felt great, and it's been wonderful & amazing, giving him motivation"- PICU Mom

"They're good. They're getting me back on track"- PICU Patient

"That went swimmingly well!"- PICU RN

Weill Cornell Medicine
Pediatrics

NewYork-Presbyterian
Phyllis and David Komansky
Children's Hospital

Lessons Learned

- EM can be safely implemented in the PICU, without significant adverse events using an inter-professional team approach.

- Future studies should be performed evaluating EM outcomes in the Pediatric population

Thank You

Questions?

Emily Carlton, BS, CCLS; Emily Warren, MSN, RN, CNS; Waun'Shae Blount, BA;
Beth Wieczorek, CRNP-AC; and Sapna R. Kudchadkar, MD on behalf of the PICU Up! Task Force

Families PICU Up!

Evaluating Family Perspectives and Needs for Development of a PICU Family Engagement Program

Presented by: Emily Carlton, BS, CCLS and Emily Warren, MSN, RN, CNS

November 8, 2017

Objectives

- Describe the analysis of family perspectives on involvement in care
- Discuss the role of parents and family members in supporting care

Background

JOHNS HOPKINS CHILDREN'S CENTER

- Parent participation in caring for hospitalized children is understood as norm in pediatric nursing, though parent involvement of children who are chronically ill versus acutely ill may vary
- While initial compliance with early mobility in a Michigan SICU fell as low as 66%, activity sessions increased to 94% following an initiative to involve family daily
- A series of quality improvement studies found that children cried less, were less restless, and required less medication when their parents were present and assisted in pain assessment and management

Background

- Parents feel that their presence and participation in their child's care is very important and beneficial to their child, to nurses and to themselves
- Parents see themselves as making an important contribution to their child's care in hospital because of their unique knowledge of their child and their ability to reassure and provide comfort him/her
- Early mobility presents an opportunity to engage families in their natural role

Methods

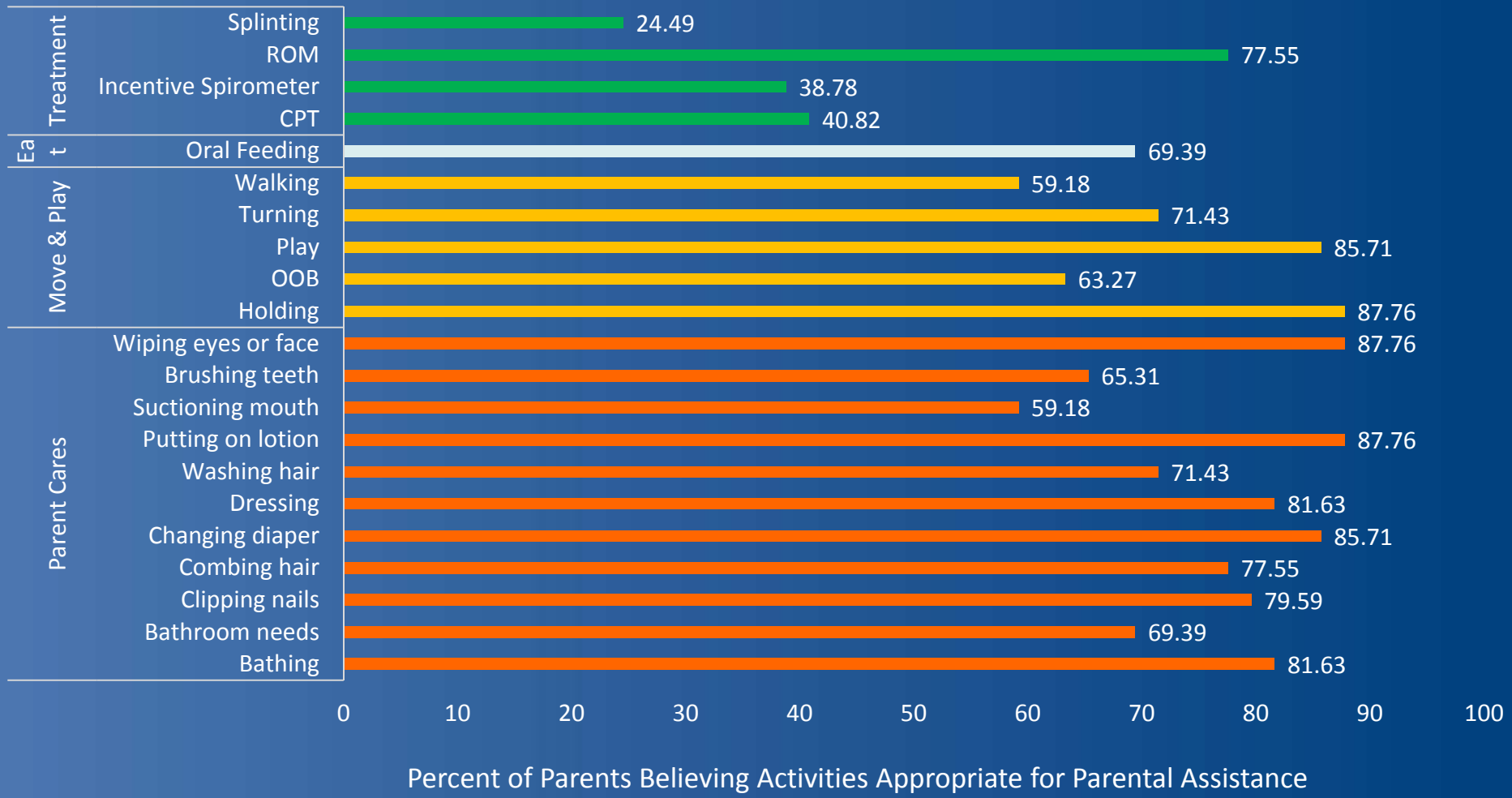
- 12 question parent and family survey
  - Demographic questions
  - Likert scale questions pertaining to interest, comfort, inclusion, and education related to participation in care
  - Identification of preferred activities
- Surveyed all English speaking parents and family members on day 3 of PICU admission

Results

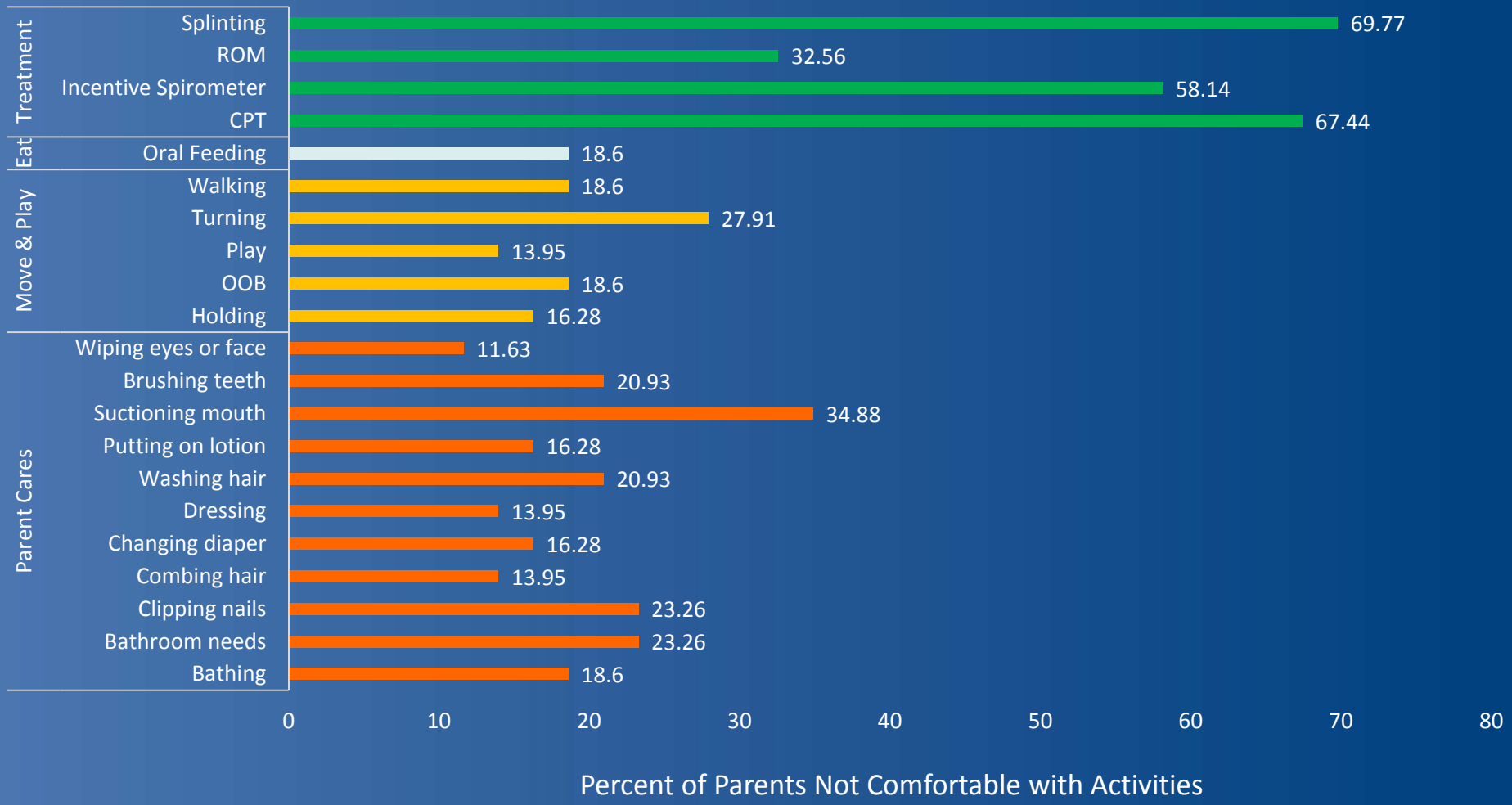
50 parents and family members participated

- 86% were interested in participating in care
- 88% were very comfortable in participating in care
- 80% felt very included in care
- 34% strongly agreed educational materials were available

Activities Appropriate for Parent Participation



Activities Parents Not Comfortable Performing



Parent and Family Concerns

JOHNS HOPKINS CHILDREN'S CENTER

- Some activities are not part of parenting, are medically oriented
- Not sure how to perform activity properly, fear of harming child
- Concerns for causing pain
- Lack of knowledge or education
- Belief permission is needed for activity

Parent and Family Recommendations

- Comfort increases when condition improves
- Engaging parents/families would support transition home
- Requests for more involvement in daily cares – like giving medications
- Education needed

Next Steps

- Introduce parent and family engagement menu this fall
- Re-survey parents and family members post-implementation

PICU UP!

Families PICU Up!

A family participation menu

We know that helping care for your child may be something you want to do. The lines, tubes and wires that are important in the treatment of your child can be scary and you may feel unsure if you can help.

Here are activities that you may want to do for your child with some help from us. Please let your nurse know if there is an activity you are interested in or if there is something not on the list that you want to do.

Parent Cares

- Comb hair
- Wash hair
- Suction mouth
- Brush teeth
- Wash face
- Take a bath
- Put on lotion
- Get dressed
- Change diaper
- Help with the bathroom

Move & Play

- Play
- Take a walk
- Hold in arms or on lap
- Turn in bed
- Help get out of bed

Eat & Drink

- Help feed
- Order meal tray
- Offer pacifier

Treatment

- Perform chest PT
- Apply splints to hands or feet
- Help with stretches
- Encourage breathing exercises

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AMAZING THINGS ARE HAPPENING HERE

Exploring Nursing Attitudes Towards Early Mobilization in the Cardio-Thoracic Intensive Care Unit

Alicia Tucker, BSN, RN and Cynthia K. Fine, MSN, CRRN

11.04.17

New York Presbyterian Hospital: Columbia Medical Center

Disclosures

- Alicia Tucker
- Cynthia Fine

Early Mobilization Program History

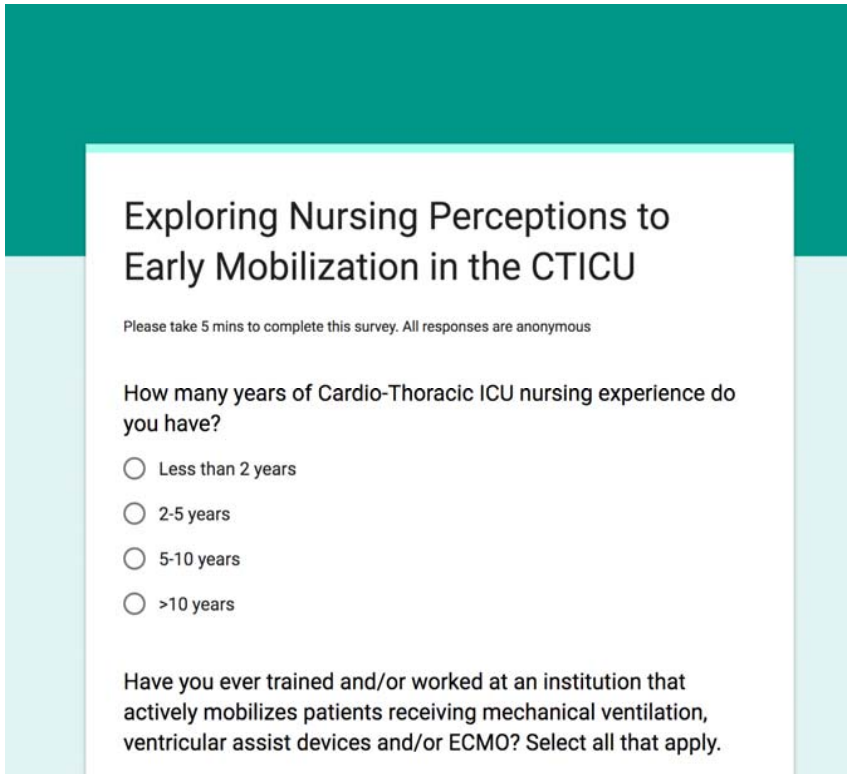
- Initiated January 2012 in the Cardio Thoracic ICU (CTICU)
- Perceived negatively overall by RNs in the CTICU
- Cited numerous barriers to early mobilization (EM) of patients
- Provided EM treatments to a large number of patients since 2012
- Provided continuing education and hands-on experience to demonstrate EM program safety and efficacy to RNs
- Identified areas for improvement based on RN feedback, inclusive of examining RN attitudes and perceived barriers to EM

Objective

- Background:
  - EM of CTICU patients has been proven to improve patient outcomes
  - RNs function as facilitators across disciplines to promote EM
  - RN perceptions of EM have not been explored
- Objective:
  - Assess RNs' perceptions of EM for patients in the CTICU on mechanical ventilation, ventricular assistive devices, and ECMO to identify barriers to promoting EM .
  - Analyze and address barriers to increase RN perceptions and promotion of EM in the CTICU.

Methods

- Developed electronic survey for CTICU RNs
  - Administered in July 2017-August 2017
  - 14 question evaluation of RN attitudes and perceived barriers to EM in the CTICU
  - Brief, only 5 minutes to complete



Exploring Nursing Perceptions to Early Mobilization in the CTICU

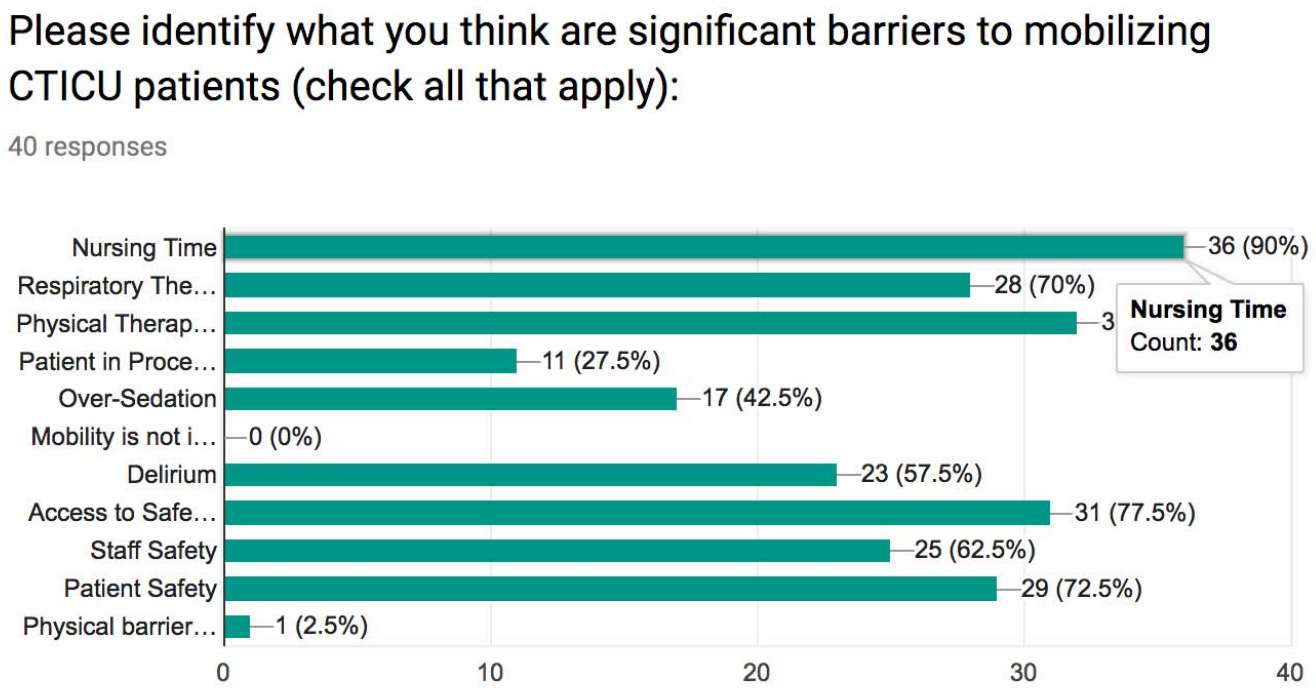
Please take 5 mins to complete this survey. All responses are anonymous

How many years of Cardio-Thoracic ICU nursing experience do you have?

- ○ Less than 2 years
- ○ 2-5 years
- ○ 5-10 years
- ○ >10 years

Have you ever trained and/or worked at an institution that actively mobilizes patients receiving mechanical ventilation, ventricular assist devices and/or ECMO? Select all that apply.

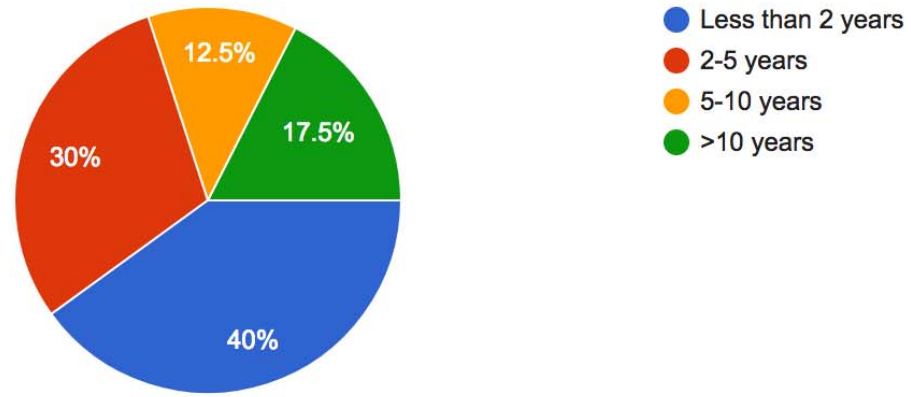
Results


Please identify what you think are significant barriers to mobilizing CTICU patients (check all that apply):
40 responses
Nursing Time
Respiratory The…
Physical Therap…
Patient in Proce…
Over-Sedation
Mobility is not i…
Delirium
Access to Safe…
Staff Safety
Patient Safety
Physical barrier…
36 (90%)
28 (70%)
3
11 (27.5%)
17 (42.5%)
0 (0%)
23 (57.5%)
31 (77.5%)
25 (62.5%)
29 (72.5%)
1 (2.5%)
Nursing Time
Count: 36
0
10
20
30
40

Results

How many years of Cardio-Thoracic ICU nursing experience do you have?

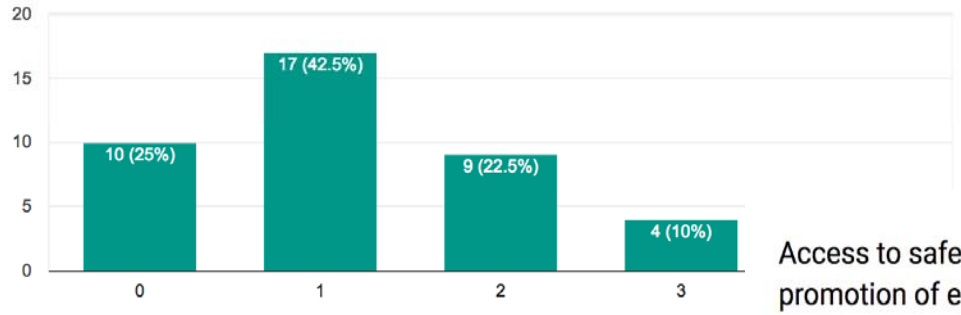
40 responses



Results

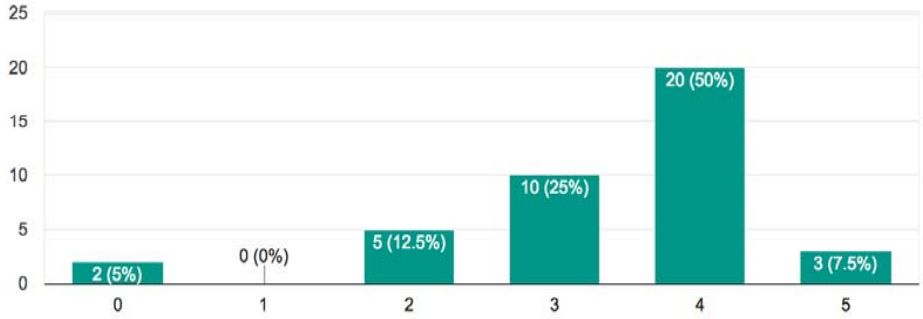
I have sufficient equipment to safely mobilize patients.

40 responses



Access to safe patient handling equipment would improve my promotion of early mobility.

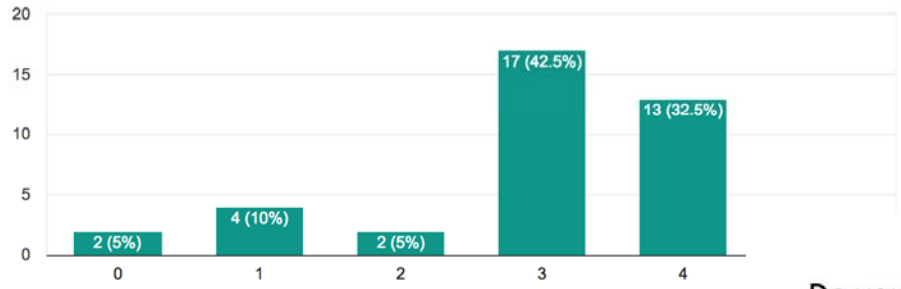
40 responses



Results

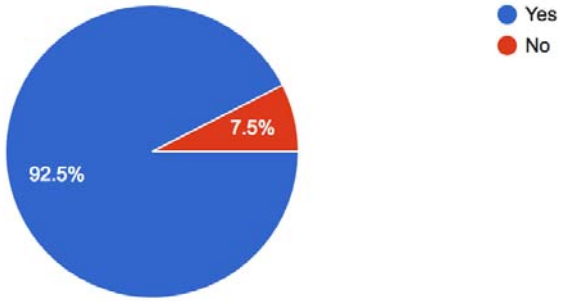
Mobilization of ICU patients should occur automatically via a nursing and PT protocol unless the physician specifically orders otherwise.

40 responses



Do you believe early mobilization reduces duration of mechanical ventilation?

40 responses




I can't get out of bed. These blankets have accepted me as one of their own and If I leave now I might lose their trust.
someecards
user card

Analysis Using A3 Problem Solving

"A3 thinking" is a problem solving approach. It is a visual aide to work through the PLAN-DO-CHECK-ACT model for performance improvement projects.

A3: Safe Patient Handling During EM

Owner:	Alicia Tucker
Mentor:	Deborah Burns & Cynthia Fine
Date:	8/23/17

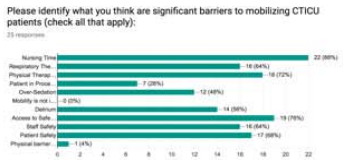
Background — PLAN

Early Mobilization (EM) in the Cardio-Thoracic Intensive Care Unit (CTICU) patient has been proven to improve patient outcomes. Nurses' often function as the facilitators across disciplines to promote early mobilization, but little has been explored regarding nursing perceptions. The objective of this PI was to assess nurses' perceptions of EM for patients on mechanical ventilation, ventricular assistive devices and ECMO and identify barriers to its promotion.

Out of this initial survey, nurse's overwhelming cited (76%) access to patient safe handling devices as a significant barriers to mobilizing CTICU patients. Additionally 56% of nurses responded they strongly agree "access to safe patient handling equipment would improve my promotion of early mobility."

Current condition — PLAN

of work related injuries to mobilizing patients.
# of designated patient safe handling equipment items
Lack of education on safe mobilization



Goal / Target Condition — PLAN

Assessment Questions

1. Is there a clear goal or target? Yes
2. What, specifically, is to be accomplished?

Trial Patient Safe Handing Equipment and identify 2 items to help safely mobilize patients. Bedside in-service for staff on body mechanics with PT.

1. How will this goal be measured or evaluated?

Raw data from work related injuries d/t mobilization of patients on unit. Repeat survey on nursing attitudes towards early mobilization.

1. What will improve, by how much, and when? Reduction on injuries by 50 % by close of FY 2018. In-service 80% of staff by December 2018.

Root Cause Analysis — PLAN

Countermeasures — DO

- Host Inter-disciplinary in-service on Body Mechanics and Early Mobilization
- Collaborative Trials of 2-3 products for Safe Patient Handling
- Use Mobile Heartbeat for Communication with PT and RN's
- Standardize Mobility Assessment
- Nurse Driven EM Protocol

Confirmation (results) — CHECK

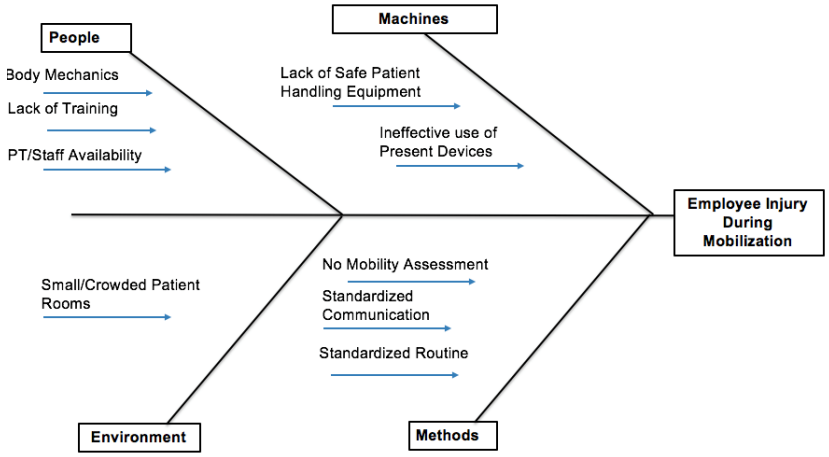
- Data from 1st Quarter
- 80% of staff in-serviced
- 100% of PT's on Mobile Heartbeat
- Standardized Mobility Assessment Tool in Bedside Binder
- Development of Nurse Driven EM Protocol

Follow up (actions) — ACT

- Re-evaluate Nursing Perceptions to Safe Patient Handling during EM
- Assess use of Safe Patient Handling Devices

A3 Problem Solving Template v1.2 (April 2015) by Henrik Knibergand Tom Poppendieck
Original link: http://www.crisp.se/lean/a3-template

Analysis



Most Significant Barrier is access to Safe Patient Handling Devices for Mobilization/ Employee Injury During Mobilization

Where are we now in our PDCA Cycle?

Interdisciplinary In-service on Patient Safe Handling

Inter-disciplinary Evaluation of Patient Safe Handling Devices

- Held two evaluation sessions in October 2017 for Night & Day Staff
- Received positive feedback on potential safe patient handling devices.
- Well attended by RN's, PT's, MD's and PA's.

BONUS!
Improved Interdisciplinary Relationships

- CTICU Retention, Recruitment & Recognition (R3) Committee
  - Celebrates unit and staff accomplishments
  - Rewards staff for teamwork and collaboration
    - Physical Therapist recognized as “Employee of the Month” May 2017

Conclusion

- CTICU RN perceptions and attitudes towards EM continue to improve since implementation of EM program in 2012
- Patient Safe Handling initiatives are a driver in RN engagement with EM
- Repeat survey will be conducted in December 2017 following full implementation of patient safe handling devices and in-services!

Thank You.

Contact Information

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Understanding perceived barriers to patient mobility in a medical ICU using a validated early mobility barriers survey

Carrie M. Goodson, MD MHS; Lisa A. Friedman, ScM; Earl Mantheiy, BA; Kevin Heckle, BS; Annette Lavezza, OTR/L; Amy Toonstra, PT DPT CCS; Ann Parker, MD; Jason Seltzer, PT DPT; Michael Velaetis, PA-C MS; Mary Glover, MSN RN CCRN; Caroline Outten, BSN RN CCRN; Kit Schwartz, BS RRT MHA; Antionette Jones, PCT; Sarah Coggins, OTR/L; Dale M. Needham, FCPA MD PhD

JOHNS HOPKINS MEDICINE

6th Annual Johns Hopkins Critical Care Rehabilitation Conference November 4, 2017

Disclosures

- None

Objectives

- Background
- Methods
- Results
- Conclusions

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BACKGROUND

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Early mobility in the ICU

- **ICU survivors**
  - Poor strength
  - Poor physical function

- Early mobility can improve outcomes
  - Including from nurses, non-PT providers
    - Intervention vs usual care: functionally independent at hospital discharge 51% vs 28%

Pfoh Int Care Med 2016
Schaller et al. Lancet 2016

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Quality Improvement (QI) project:

- Goal:
  - ↑ RN/tech-led MICU patient mobilization
- Step 1: Gather data
  - Barriers to be overcome?
    - All MICU staff

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METHODS

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Barriers Survey

- Knowledge
- Attitudes
- Behaviors
- 26 questions
- Answers:

1 – 2 – 3 – 4 – 5

Strongly Disagree Neutral Strongly Agree

- Physicians/APP
  - Attendings
  - Fellows
  - Nurse Practitioner or Physician Assistant
- Respiratory Therapists
- Nurses
- Clinical Technicians

Hoyer et al. Am J PM&R 2014

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RESULTS

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Respondents

	Clinical Tech	Nurse	Respiratory Therapist	Attending Physician	Fellow	NP/PA
Invited, #	7	93	14	13	28	7
Response rate, %	100	92	100	100	100	100
Years of experience	2 (1-2)	5 (2-10)	14 (8-17)	16 (15-20)	6 (4-7)	6 (3-11)

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Survey Results

	Clinical Tech (7)	Nurse (86)	Respiratory Therapist (14)	Attending Physician (13)	Fellow (28)	NP/PA (7)
Knowledge	20 (15-25)	25 (20-30)	25 (15-30)	30 (27-40)	30 (23-35)	35 (5-50)
Attitudes	33 (29-44)	38 (29-44)	36 (31-40)	30 (23-36)	33 (28-36)	36 (31-49)
Behaviors	34 (25-37)	39 (32-43)	33 (30-39)	28 (26-31)	32 (25-39)	35 (28-46)
Overall	**32** (25-37)	**37** (31-40)	**32** (31-37)	**30** (28-34)	**31** (26-37)	**36** (29-39)

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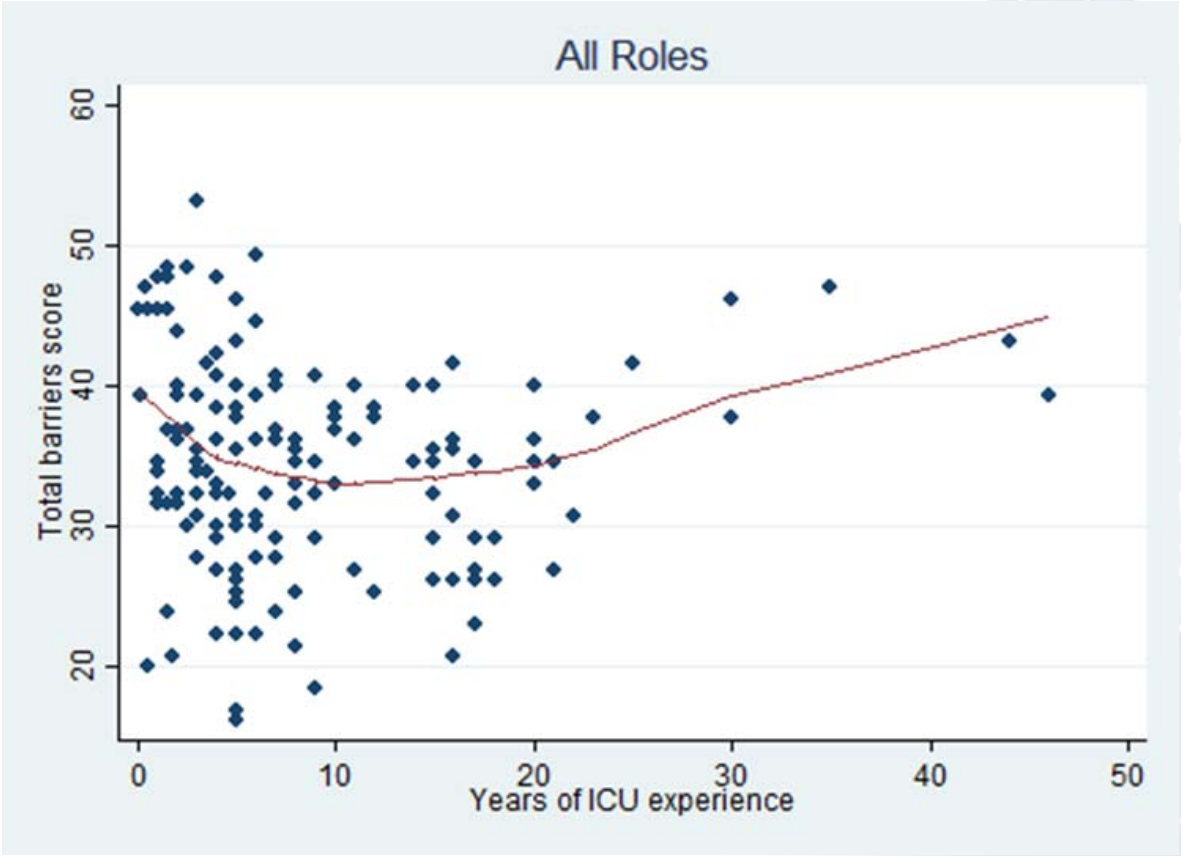
Effect of experience



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Linear Regression Model

	Overall	p	Knowledge	p	Attitudes	p	Behaviors	p
MD/NP/PA	[reference]							
RN/Clinical Tech	**3.1**	**0.026**	**-4.7**	**0.031**	**3.7**	**0.040**	**5.2**	**<0.001**
Respiratory Therapist	2.9	0.206	-2.9	0.426	4.6	0.119	3.5	0.167
Experience < 10 yr, /yr	**-0.8**	**<0.001**	**-0.8**	**0.020**	**-0.9**	**0.002**	**-0.7**	**0.008**
Experience > 10 yr, /yr	**1.0**	**0.001**	**1.3**	**0.009**	**1.1**	**0.004**	**0.8**	**0.015**

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Conclusions

- Large multi-D sample, response ≥ 92%
- Low barriers to mobility
  - Attitudes & behaviors are highest barriers
- Effect of experience:
  - Decreases barriers in 1st 10 years
  - Increases barriers after 10 years
- Nurses/Clinical Technicians ≠ MD/PA/NP

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Acknowledgments

Lisa A. Friedman, ScM
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Questions?

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MEDICINE

Creating a Protocol for the Mobilization of Patients with Critical Lines

A Physical Therapist Driven Multidisciplinary Initiative

Sara Krasney, PT, DPT **Janelle Jablonski, PT, DPT** **Allison Kras PT, DPT**

proud member of wellforce

Tufts Medical Center

Floating Hospital for Children at Tufts Medical Center

Introduction

- **Tufts Medical Center**
  - Located in Boston, MA
- Academic Medical Center
- Level I Trauma Center
  - 415 beds
  - 5 adult ICUs

Objectives

- Utilize research to create **an evidence-based protocol** for mobilizing patients with critical lines
- Evaluate, modify, and finalize above protocol using a **physical therapist (PT) driven multidisciplinary team approach**
- **Standardize mobility expectations** for health care providers at Tufts Medical Center

Introduction

- Different units, nurses, therapists, and physicians demonstrated **varying expectations and comfort levels regarding patient mobility**
  - No uniform policy to guide the safe mobilization of patients, particularly in the ICUs, with various critical lines

Introduction

- *Questions we asked ourselves…*
  - What is the hospital-wide expectation for mobility?
  - What if the patient has a critical line? Or multiple critical lines?
  - **What is safe?**

Methods

- **Step #1: Identifying the problem**
  - Inconsistent mobility practices were observed for patients with:
    - *Temporary pacemakers*
    - *Femoral access*
    - *Pulmonary artery catheters (PACs)*
    - *Hemodialysis (HD)*
    - *Continuous renal replacement therapy (CRRT)*
    - *Intra-aortic balloon pumps (IABPs)*
    - *Impella devices*
    - *CentriMag Ventricular Assist Devices (VADs)*
    - *Extracorporeal membrane oxygenation (ECMO)*

Methods

- **Step #2: Systematic literature review**
  - Examined mobility practices for patients requiring critical lines
- **Step #3: Drafting a protocol**
  - Findings from 35+ articles were incorporated into an evidence-based protocol for mobilizing patients with "problem" lines/devices

Methods

- **Step #4: Building an expert panel to evaluate and modify the protocol**
  - We asked for input from other clinicians at our institution
    - Intensivists and attending physicians, nursing leadership, and rehabilitation department staff
  - We facilitated discussion between multidisciplinary team members via emails and live meetings

Methods

- **Step #5: Creating a final product**
  - Feedback from expert panel incorporated into a final product and "approved" by all involved
    - Compromises were made to ensure the 3 tenets of evidence-based practice were considered:
      - Clinician expertise
      - Scientific research
      - Patient/caregiver values
  - Protocol was presented at the hospital's Critical Care Committee meeting and submitted as a hospital-wide policy

Results

- Hospital staff involved in patient care have access to a **comprehensive, evidence-based protocol for mobilizing patients** who meet inclusion criteria
- Multidisciplinary team approach found to be *feasible and advantageous* for making changes in hospital policy
- **Buy-in from more than one discipline is imperative to changing hospital culture!**

Conclusion

- It is essential that acute care PTs who encounter critical lines know the implications of such lines on patient mobility
- A protocol for mobilizing patients with critical lines **promotes a culture of safe mobility** in the acute care setting
- The process used to create this protocol is feasible and can be applied to other challenges encountered in patient care

What's next?

- We're not done!
  - Educating clinicians to use the protocol
  - Data collection

Thank you to the clinicians who were involved in the creation of this protocol:

- Adel Ghuloom, MD
- Erik Garpestad, MD
- Ronald Perrone, MD
- Klemens Meyer, MD
- Haval Chweich, MD
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- Navin Kapur, MD
- Michele Esposito MD
- Dorothy Didomenico, RN
- Jamie Corral, RN
- Ken Shanahan, RN
- Donna Hernandez, RN
- Diandra Deblasio, RN
- Maria Ippolito
- Linda Courtemanche
- Michael Foley
- Abbey Boudouvas, PT, DPT
- Kristine Tang OTR/L
- Kristin Boyd, PT, DPT

Questions?

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ORIGINAL RESEARCH

Intensive Care Physiotherapy during Extracorporeal Membrane Oxygenation for Acute Respiratory Distress Syndrome

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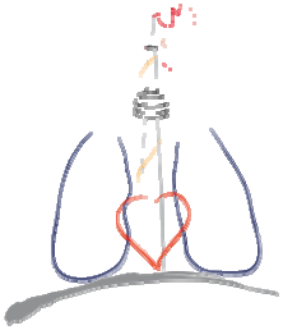


* ICU physiotherapy has been associated with reduction in ICU acquired weakness and shorter duration of mechanical ventilation and hospital stay.

* Recent technological advances in ECMO devices have made early physiotherapy feasible for this population

* Increase survival of the critically ill is also associated with increased risk of functional impairments

Objectives

* Characterize physiotherapy delivered to patients with ARDS supported with ECMO

* Exploratory Analysis: Evaluate the association of this therapeutic modality with mortality

Methods

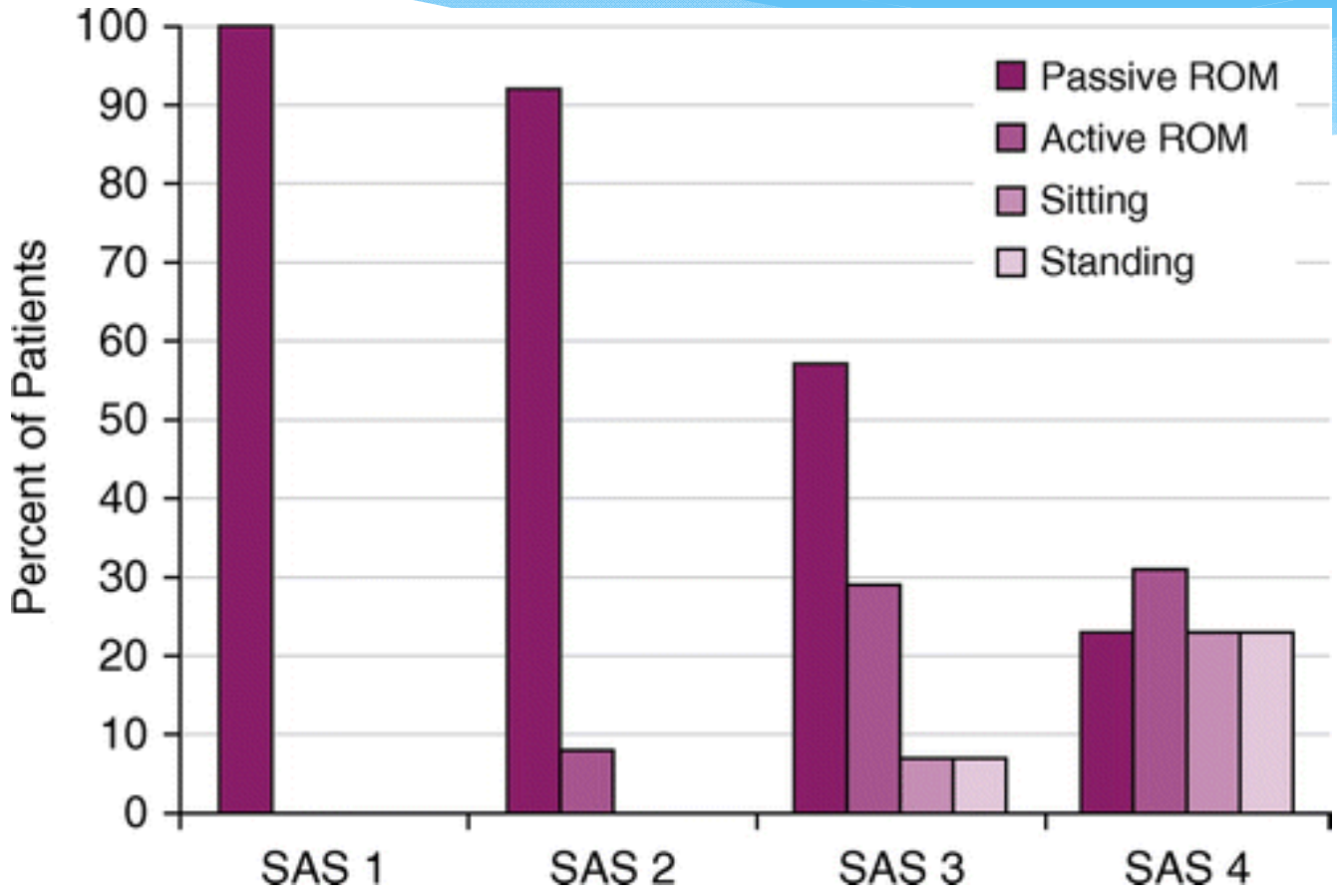
* A retrospective cohort study of all adults who underwent veno-venous (VV) ECMO at the Toronto General Hospital for severe ARDS between 2010-2015.

* Physiotherapy scores were determined by the ICU Mobility Scale (IMS), which is a detailed activity scoring system ranging from 0 (lying in bed) to 10 (walking independently without gait aid)

Frequency and Impact

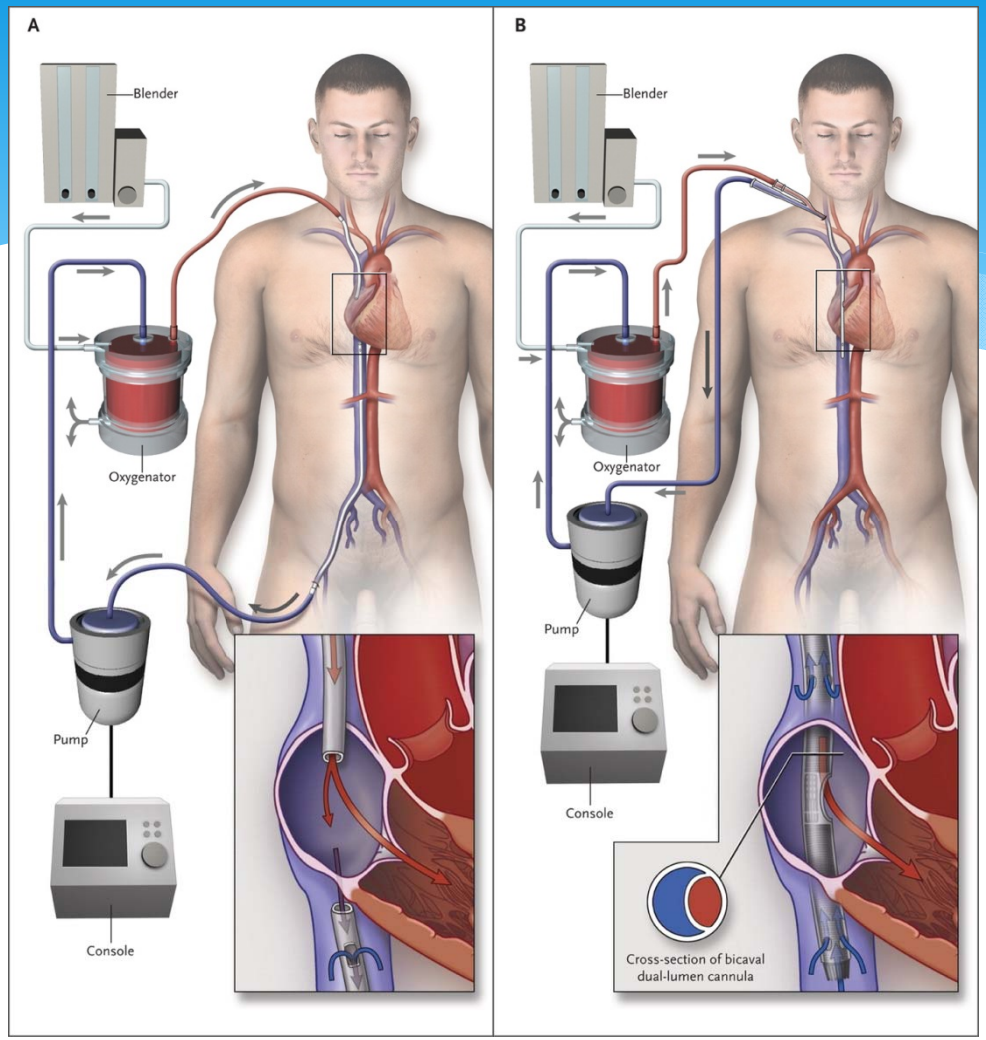
* 107 patients underwent ECMO, 61 (57%) for ARDS
* 82% of patients underwent consultation with physiotherapy
* 39% of patients best IMS scores on ECMO were 2 or higher (sitting in bed/exercises in bed)
* 17% of patients best IMS scores were 4 or higher (actively sitting at edge of bed)

Maximum Activity based on Sedation Agitation Scale



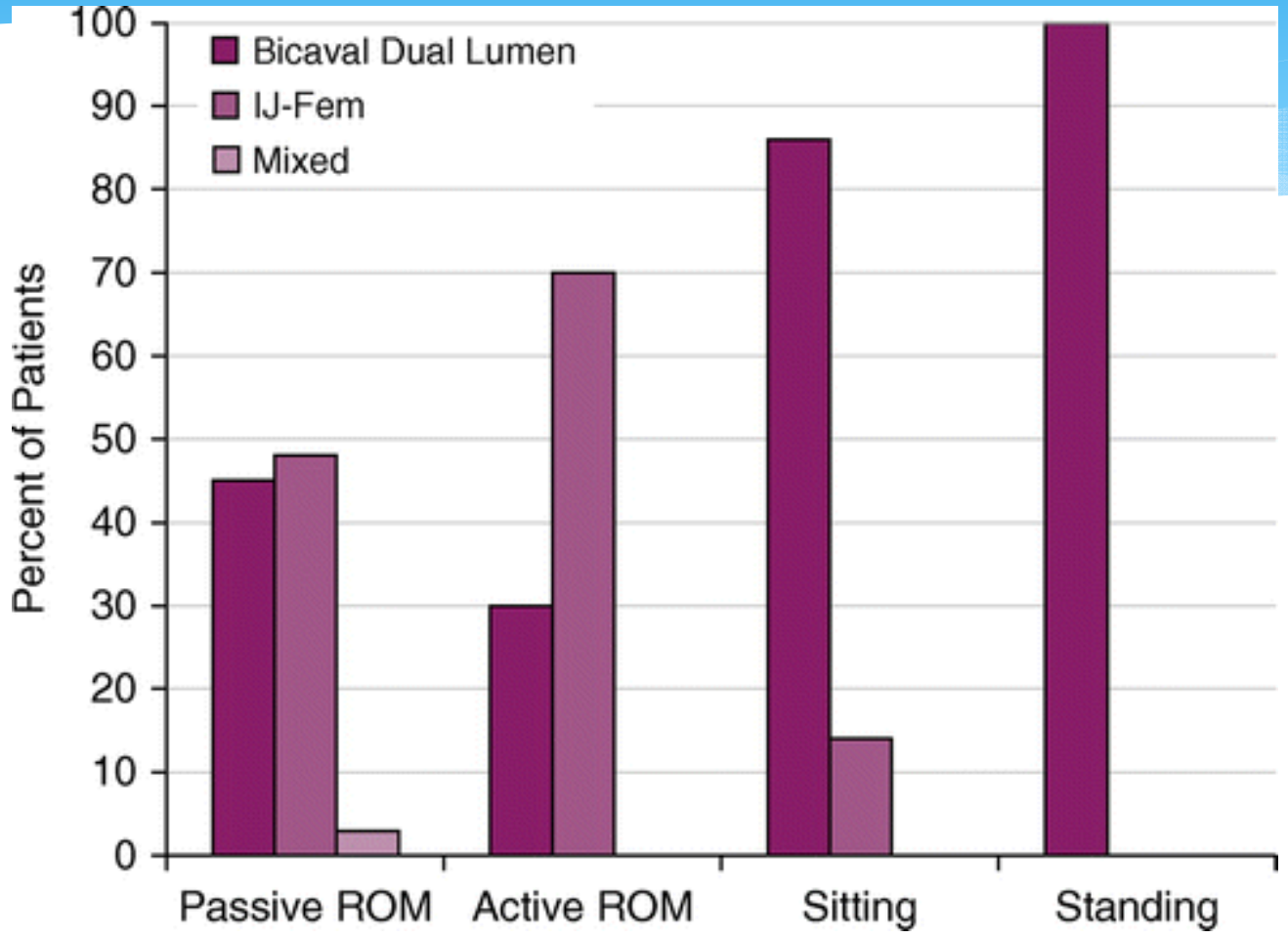
ARDS Cannulation

* Patients with ARDS, on average, require higher ECMO support, paralysis and possibly high ventilator settings
* Cannulae more suited for mobilization have limitations in their maximal attainable flows; multiple cannulae may be required to match oxygen demand.
* Cannula options are: Bicaval dual lumen, IJ-femoral and mixed



Extracorporeal Membrane Oxygenation for ARDS in Adults
Daniel Brodie, M.D., and Matthew Bacchetta, M.D.
N Engl J Med 2011; 365:1905-1914November 17, 2011DOI: 10.1056/NEJMct1103720

Activity Based on Cannulation Site

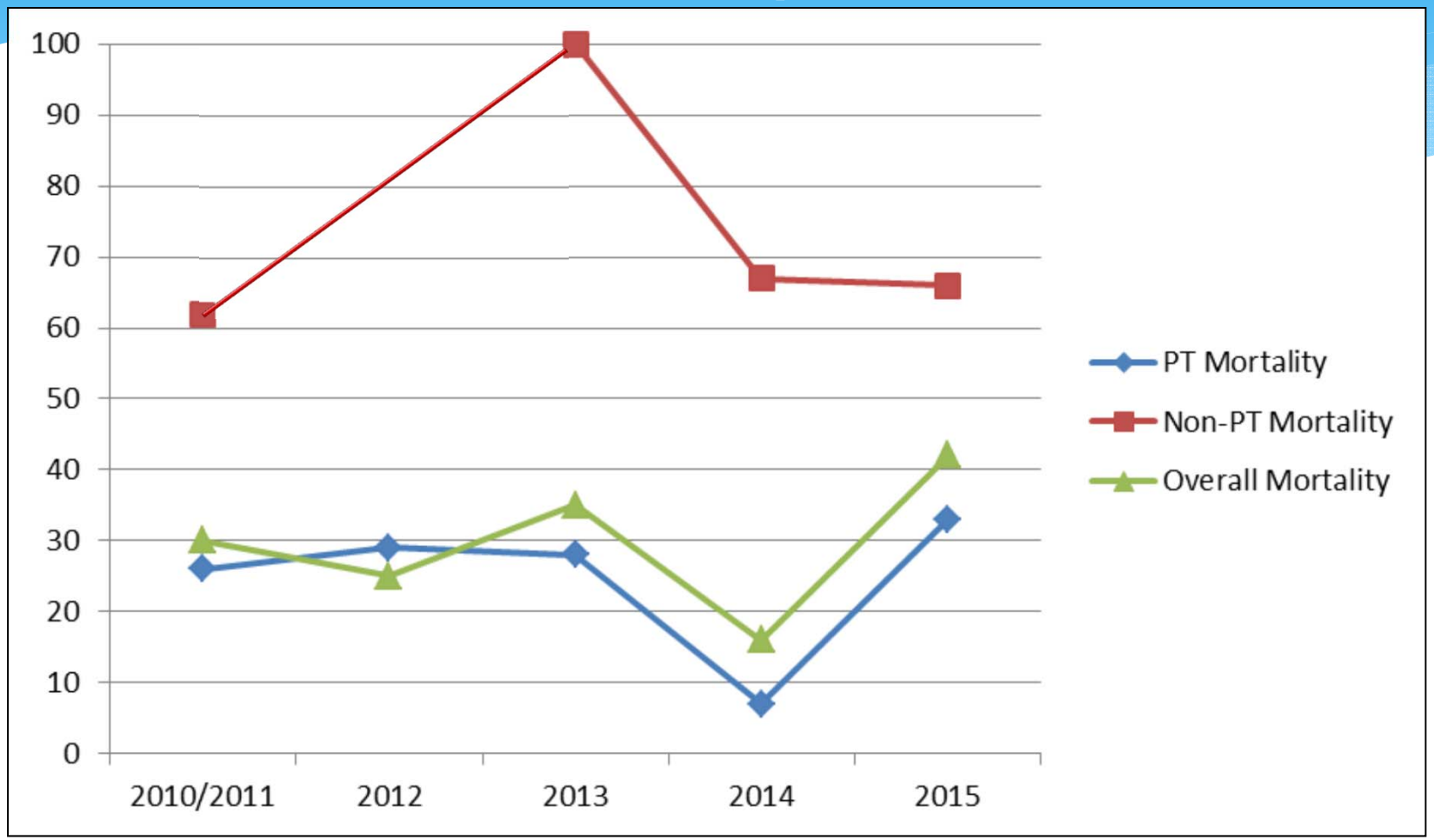


Tilt Table R IJ and R fem

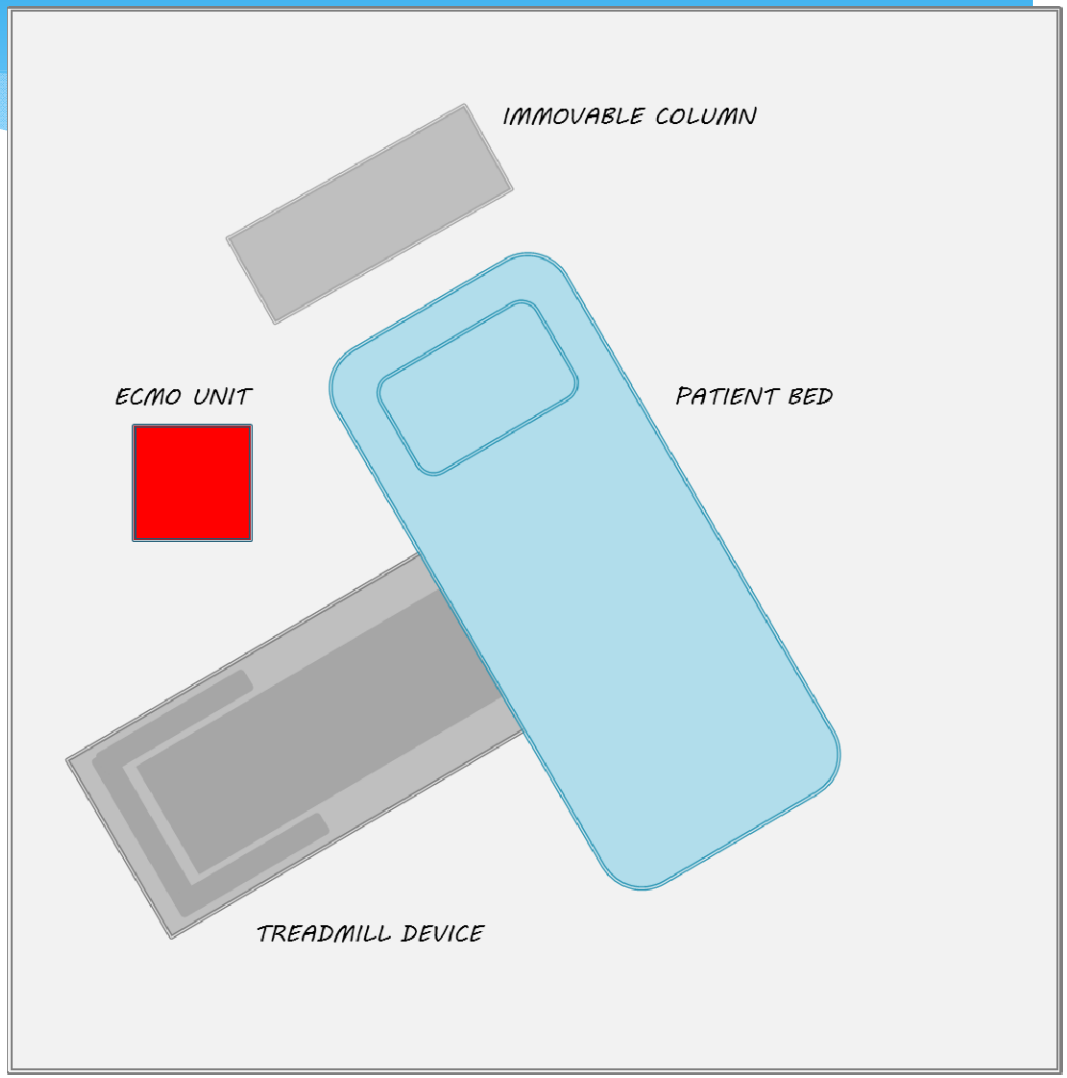
Frequency and Impact

* 82% of patients received physiotherapy
* ICU and hospital mortality: 22% among those who received physiotherapy compared to 64% who did not

Overall Mortality & Mortality By Physiotherapy Status



Ambulation Bicaval dual-lumen



* Up in chair with Bicaval dual-lumen

Ambulation R IJ and R Fem

Conclusion

* Early ICU physiotherapy while on ECMO is feasible and is associated with improved ICU mortality
* Physiotherapy is safe when performed by experienced team
* Future research:
  * identifying specific barriers to rehabilitation
  * the role of dedicated physiotherapy teams
  * optimal timing of initiation
  * enhancing the safety profile in patients without bicaval dual lumen cannula

Thank You

Feasibility and inter-rater reliability of the ICU Mobility Scale

Author links open overlay panel Carol Hodgson , Dale Needham, Kimberley Haines, Michael Bailey, Alison Ward, Megan Harrold, Paul Young, Jennifer Zanni, Heidi Buhr, Alisa Higgins, Jeff Presneill, Sue Berney

ICU Mobility Scale.

	Classification	Definition
0	Nothing (lying in bed)	Passively rolled or passively exercised by staff, but not actively moving
1	Sitting in bed, exercises in bed	Any activity in bed, including rolling, bridging, active exercises, cycle ergometry and active assisted exercises; not moving out of bed or over the edge of the bed
2	Passively moved to chair (no standing)	Hoist, passive lift or slide transfer to the chair, with no standing or sitting on the edge of the bed
3	Sitting over edge of bed	May be assisted by staff, but involves actively sitting over the side of the bed with some trunk control
4	Standing	Weight bearing through the feet in the standing position, with or without assistance. This may include use of a standing lifter device or tilt table
5	Transferring bed to chair	Able to step or shuffle through standing to the chair. This involves actively transferring weight from one leg to another to move to the chair. If the patient has been stood with the assistance of a medical device, they must step to the chair (not included if the patient is wheeled in a standing lifter device)
6	Marching on spot (at bedside)	Able to walk on the spot by lifting alternate feet (must be able to step at least 4 times, twice on each foot), with or without assistance
7	Walking with assistance of 2 or more people	Walking away from the bed/chair by at least 5 m (5 yards) assisted by 2 or more people
8	Walking with assistance of 1 person	Walking away from the bed/chair by at least 5 m (5 yards) assisted by 1 person
9	Walking independently with a gait aid	Walking away from the bed/chair by at least 5 m (5 yards) with a gait aid, but no assistance from another person. In a wheelchair bound person, this activity level includes wheeling the chair independently 5 m (5 years) away from the bed/chair
10	Walking independently without a gait aid	Walking away from the bed/chair by at least 5 m (5 yards) without a gait aid or assistance from another person

Riker Sedation-Agitation Scale (SAS)

Score	Term	Descriptor
7	Dangerous Agitation	Pulling at ET tube, trying to remove catheters, climbing over bedrail, striking at staff, thrashing side-to-side
6	Very Agitated	Requiring restraint and frequent verbal reminding of limits, biting ETT
5	Agitated	Anxious or physically agitated, calms to verbal instructions
4	Calm and Cooperative	Calm, easily arousable, follows commands
3	Sedated	Difficult to arouse but awakens to verbal stimuli or gentle shaking, follows simple commands but drifts off again
2	Very Sedated	Arouses to physical stimuli but does not communicate or follow commands, may move spontaneously
1	Unarousable	Minimal or no response to noxious stimuli, does not communicate or follow commands

Guidelines for SAS Assessment

1. Agitated patients are scored by their most severe degree of agitation as described
2. If patient is awake or awakens easily to voice ("awaken" means responds with voice or head shaking to a question or follows commands), that's a SAS 4 (same as calm and appropriate – might even be napping).
3. If more stimuli such as shaking is required but patient eventually does awaken, that's SAS 3.
4. If patient arouses to stronger physical stimuli (may be noxious) but never awakens to the point of responding yes/no or following commands, that's a SAS 2.
5. Little or no response to noxious physical stimuli represents a SAS 1.

This helps separate sedated patients into those you can eventually wake up (SAS 3), those you can't awaken but can arouse (SAS 2), and those you can't arouse (SAS 1).

1. Prospective evaluation of the sedation-agitation scale in adult ICU patients. *Crit Care Med* 1999; 27:1325-1329.
2. Assessing sedation in ventilated ICU patients with the bispectral index and the sedation-agitation scale. *Crit Care Med* 1999; 27:1499-1504.
3. Confirming the reliability of the Sedation-Agitation-Scale in ICU nurses without prior experience in its use. *Pharmacotherapy* 2001; 21:431-436.
4. Validating the Sedation-Agitation Scale with the bispectral index and visual analog scale in adult ICU patients after cardiac surgery. *Intensive Care Med* 2001; 27:853-858.

Poster Presentations

6th Annual Johns Hopkins Critical Care Rehabilitation Conference

Baltimore, MD

The Power of Networking: NYC Occupational Therapy ICU Discussion Group

Lauren Cohen, MS, OTR/L

NewYork-Presbyterian
Columbia University Medical Center

Learning Objectives

This project demonstrates to occupational therapists and other interdisciplinary team members, the importance of working together to share ideas and develop the knowledge and skills to perform best practice in critical care. Occupational therapists represent a smaller percentage of this interdisciplinary care team and networking with clinicians in similar institutions is crucial to share ideas, evaluation and treatment strategies, and projects in order to promote early patient access to occupational therapy services.

Abstract Summary

Occupational therapists play a vital role in this early stage of rehabilitation to maximize the patient's functional recovery. As the ICU emerges as a common treatment arena for OTs in the acute care setting, it is necessary to develop clinical resources to help further the practice of beginning therapists. Practicing in the ICU requires a more advanced skill set than is typically covered in an OT masters entry-level program.

How The Group Was Formed

The "NYC OT ICU Discussion Group" began with initial contact to occupational therapy supervisors in acute care in the tristate area. Group facilitators maintained contact via email, social media, and quarterly face-to-face meetings. Participants were polled for agenda items and trending topics in order to prepare for each meeting.

Topics and Themes Discussed

- safe patient handling techniques
- education resources for educating team members on OT's role in the ICU
- ways to Involve patient family into treatment sessions
- cognitive assessment screens
- delirium management-non pharmacological techniques
- CAM ICU training
- practical cognitive activities to use in ICU setting
- communication-written adaptations, IPAD apps, and picture boards
- challenges interacting with other team members
- Ways to train your staff to treat patients in the ICU
- student education guidelines and training in the ICU

Background

The clinical importance and potential significance of these findings are invaluable to practicing in the ICU. This special interest group in New York City began in 2014 and is now made up of over 50 occupational therapists. Therapists involved come from New York Presbyterian Hospital at Columbia, New York Presbyterian Hospital at Cornell, Mount Sinai Hospital, Montefiore, NYU Langone, NYU Bellevue, Westchester Medical Center, and Mount Sinai Roosevelt Hospital.

We meet quarterly in person, but have constant contact through email and Facebook.

References

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*****Edits Made By: Megan Evangelist, MS/OTR/L*****

Patient and Family-Centered Occupational Therapy in Patient with Bilateral Subarachnoid Hemorrhage and Right Middle Cerebral Artery Bifurcation Aneurysm

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MAGNET RECOGNIZED – AMERICAN NURSES CREDENTIALING CENTER

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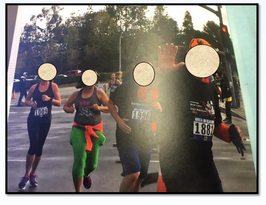
Background

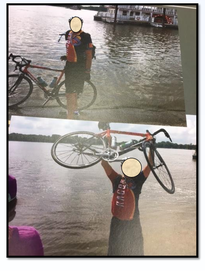
- 67 year-old male, married, father of 3 (daughter and twin sons), 6 grandchildren, owner of an insurance company, soccer coach, avid distance runner (70-100 races), avid cyclist (4 times across the state of Iowa – 440 miles in 7 days)
- MHx: RA, HTN, HLD, presenting to the Emergency Department with a sudden-onset headache
- While lifting weights on a lunch break from work – experienced sudden headache, initially like a "kink" gradually worsening, 8/10 pain in the back of his head to the temples, constant
- Flashing light in bilateral eyes, dizziness, near syncope, photophobia
- CT revealed bilateral SAH - right fronto-temporal craniotomy for aneurysm clipping, mild right fronto-temporal infarction
- Daily Transcranial Doppler study
- Close hemodynamic monitoring
- Occupational therapy (OT) on post-operative (craniotomy) day 3, post extubation, and throughout the 18 days in the Critical Care Unit (CCU)
- Celebrated 44th wedding anniversary in CCU last year just before discharge to acute rehab, where he stayed for 8 days until discharge home

Purpose

To demonstrate how OT:

- provides patient-centered and family-centered care in the CCU
- helps maximize functional independence while a patient is being closely monitored for risk for cerebral vasospasms
- educates patient and family about functional implications of a neurosurgical condition
- guides patient and family in the initial stage of coping and adjusting





"it was helpful … to hear … therapists instructed him when it came to his different therapies so that we could use the same terms, remind him of the instructions they gave him..."

"we knew that his injury was very serious and we weren't sure what his level of recovery or long-term deficits might be"

Methods

Based on the day-to-day status and needs of patient and family, OT provided appropriate interventions:

1) Validation of patient's frustrations and confusion
2) Orientation and redirection
3) Family education about:
  i. Functional and cognitive impairments as they relate to medical diagnosis
  ii. Availability of therapies throughout the continuum of care
  iii. Benefits of journaling patient's course of recovery similar to ICU diaries
4) Use of simple **familiar activities of daily living** to optimize functional independence
5) **Grading activities** while monitoring hemodynamic stability and patient's cognitive and emotional status
6) **Patient-directed activities**
7) **Reassurance and encouragement** based on concrete examples of progress
8) Facilitation of patient-centered and family-centered **stress management** and **coping strategies**

	Initial stage: Evaluation First 2 sessions →	**Middle stage: 4 sessions →**	**Last stage: 3 sessions**
Functional Cognition	- Inconsistent command following - Verbal Perseveration - Disoriented to time	- Oriented but unable to read clock time - Distractible - Impulsive - Fewer cues required	- **Coloring book by patient's suggestion – improved awareness, sustained attention** - **Less distractible** - **Simple problem solving** - **Less perseveration**
Self-Care	- Mouth swab Maximal assist - Impaired hand coordination - Wipe face Minimal assist - Oral care Moderate assist - Upper body sponge bath Moderate assist in bed in chair position	- Oral care Supervision - Wipe hand Supervision - Feed Contact guard/Supervision - UB dress Maximal assist sitting in bed	- **Improved fine motor control** - Feed/Groom Supervision - Upper/Lower body sponge bath, UB/LB dressing Minimal assist
Functional Mobility	- 2-person assist to turn - Supine to sit Moderate assist poor+ head control - Edge of bed to groom	- Head control fair- at edge of bed - Stand Contact guard - Edge of bed with Minimal assist - Stand with Minimal assist	- **Commode transfer Minimal assist**
Family Education	- Role of OT - How to redirect patient and respond to patient's requests - Reason for restraints	- Impaired safety awareness/restlessness - Recovery process & Services	- **Positive outlook based on functional improvement** - **Cognitive deficits** - **Continuum of care: acute rehab, outpatient** - **Safe discharge plan** - **Caregiver respite**

Results

At discharge from CCU to acute rehabilitation unit, patient was able to:

a) Identify a stress management strategy
b) Feed and groom with supervision
c) Perform upper/ lower body dressing, upper/ lower body sponge-bathing with minimal assistance
d) Sustain attention despite some distractions of multiple visitors being present during the OT session
e) Engage in simple problem solving

Family participated during the sessions, asked appropriate questions, and verbalized understanding of all the education provided.

Conclusion

OT can help provide:

- a **safe and supportive environment** for patient and family
- where a patient could progress in **functional cognition**, **self-care**, and **functional transfers**, through **"just-right" challenges**

* Patient was contacted for consent to this poster, and patient and family have benefited from meeting with therapists to casually talk about:

- patient's experiences while in the ICU
- continued journey of recovery through acute rehabilitation and outpatient therapies
- **remaining challenges**

Updates:

"Five months after my aneurysm, I ran the Brea 8k race, and finished 7th out of 20 runners in my age bracket. I will be running the Surf City 10 Miler on October 15th. I currently run approximately 80-100 miles a month and am a member of a running club."
"I am currently about halfway through the 100 greatest novels ever written"

Acknowledgements

I would like to thank St. Jude Medical Center for supporting this poster presentation.
I would like to thank the patient and family for agreeing to have the case presented, for sharing their experiences candidly, and providing additional personal input.

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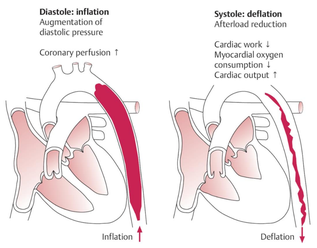
Safe Ambulation of a Patient with an Axillary Intra-Aortic Balloon Pump as a Bridge to Heart Transplant: A Case Report

Sung Cho, SPT, University of Florida
Michelle Cangialosi, PT, DPT, UF Health Rehab Center – Shands Hospital

Background and Purpose



Intra-aortic balloon pumps (IABP) are commonly utilized as a means of temporary hemodynamic support in patients with advanced heart failure.

IABP works by increasing cardiac output, ejection fraction, and coronary perfusion pressure. In essence, it decreases myocardial oxygen demand while increasing myocardial oxygen supply. It is used as a temporary measure until the patient is stable enough to undergo an operation for a LVAD or heart transplant

Based on literature review, the most common approach to placement of an IABP is through the transfemoral artery. However, this placement significantly limits patient mobility and promotes deconditioning in cases of prolonged hospitalization. Bed rest has been associated with other complications including decreased lung functioning and increased risk of pneumonia and DVT. Early mobility within the ICU environment plays an important role in negating the negative side effects of prolonged bed rest.

Cardiothoracic surgeons have utilized an alternative site for IABP placement in order to facilitate mobility. Through surgical approach, the IABP is placed in the descending thoracic aorta via either the ascending aorta or the left/right axillary or subclavian artery.

Several studies have assessed the benefit of ambulation in patients with an axillary IABP. Authors found that the axillary IABP therapy provided patients with appropriate hemodynamic support, maintained excellent mobility and had a high bridge to transplant rate.

The primary purpose of this case study was to describe the benefit of ambulation within a single patient in the cardiac ICU with an axillary IABP prior to heart transplant, as measured by the Johns Hopkins-Highest Level of Mobility Scale (JH-HLM) and the ICU Mobility Scale (IMS).

Case Description

The patient is a 37 year-old male with end-stage (EF=10-15%) cardiomyopathy, transferred to UF Health for a heart transplant evaluation.

A 1:1 right femoral IABP was initially placed upon arrival secondary to severe hemodynamic derangements.

After 14 days with a femoral IABP, the patient was transitioned to a 1:1 right axillary IABP with the sole intention of improving patient mobility and ambulation while listed as status 1A for heart transplant.

The axillary IABP remained in place for 20 days prior to undergoing heart transplant. The patient remained in the hospital for an additional 31 days before being discharged to an inpatient rehabilitation facility.

Outcomes

Outcome Measures

Johns Hopkins Highest Level of Mobility (JH-HLM) Scale

		Score
	250+ Feet	8
	25+ Feet	7
Walk	10+ Steps	6
Stand	≥ 1 Minute	5
Chair	Transfer to chair	4
	Sit at edge of bed	3
	Turn self/bed activity*	2
Bed	Only lying	1

Table 1. The JH-HLM is a scale utilized as a regular assessment of patient mobility, with scores ranging from 1 to 8 based on the mobility task performed. This is based on the observed activity the patient actually performed, not what they are capable of doing. *Bed activity includes passive or active range of motion, movement of arms or legs, and bed exercises (e.g., cycle ergometry, neuromuscular electrical stimulation).

ICU Mobility Scale (IMS)

Score	Classification
0	Nothing (lying in bed)
1	Sitting in bed, exercises in bed
2	Passively moved to chair (no standing)
3	Sitting over edge of bed
4	Standing
5	Transferring bed to chair
6	Marching on spot (at bedside)
7	Walking with assistance of 2 or more people
8	Walking with assistance of 1 person
9	Walking independently with a gait aid
10	Walking independently without a gait aid

Table 2. The IMS is a quick and simple bedside method of measuring a patient's mobility in the ICU setting. It provides an 11 point ordinal scale, ranging from nothing (i.e. lying in bed, score of 0) to independent ambulation (score of 10).

Patient Progression

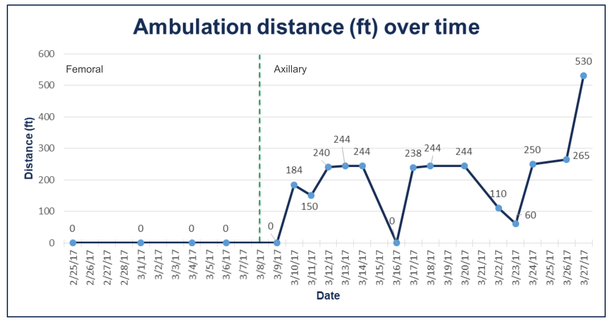


Figure 1. Distance the patient was able to ambulate from admission to heart transplant

From admission on February 22, 2017 until March 8, 2017, the highest level of mobility was a 2 on the JH-HLM and a 1 on the IMS which involved turning self or in-bed activity, such as therapeutic exercises. The patient received a total of 4 skilled therapy treatment sessions while on bed rest for 14 days with a right femoral IABP.

The patient was transitioned to a right axillary IABP on March 8, 2017, denoted by the vertical dashed green lines on Figure 1, Figure 2, and Figure 3. The patient's ambulation distances were recorded and can be found in Figure 1. It should be noted that the patient was not able to ambulate on March 16, 2017 due to an episode of v-tach requiring defibrillation on the day prior.

The patient received variable mobility scores with the highest score of 8 on the JH-HLM (Figure 2) on the day of heart transplant and the highest score of 8 on the IMS (Figure 3) on multiple days before the transplant. Based on the JH-HLM and IMS, patient mobility drastically improved once the IABP was transitioned from femoral access to axillary access.

The patient had the right axillary IABP for 20 days and received a total of 15 skilled therapy treatment sessions, varying from edge of bed mobility, out of bed to chair activity, sit to stands without upper extremity support, therapeutic exercises and gait training with hand held assist over varying distances. On the day of transplant (March 27, 2017), the patient ambulated a total of 530 feet with minimal assistance x two person assist with a seated rest break x 1 with a right axillary IABP intact and stable vital signs.

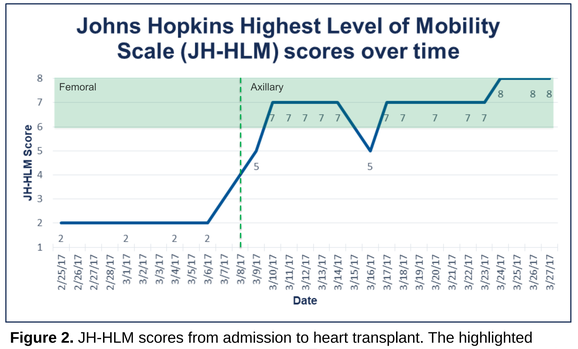


Figure 2. JH-HLM scores from admission to heart transplant. The highlighted region signifies ambulation level of mobility. The values left of the vertical dashed green line indicate femoral IABP and the values to the right indicate axillary IABP.

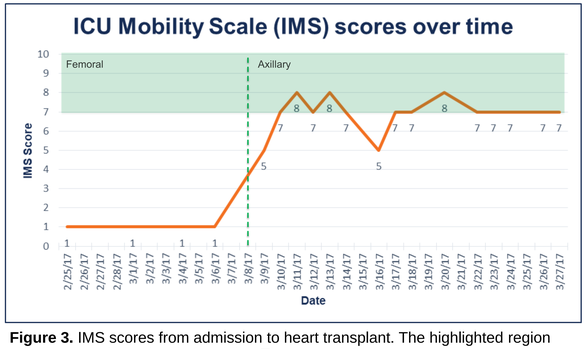


Figure 3. IMS scores from admission to heart transplant. The highlighted region signifies ambulation level of mobility. The values left of the vertical dashed green line indicate femoral IABP and the values to the right indicate axillary IABP.

Discussion

Physical therapy interventions, including functional out of bed mobility and gait training, were safely performed in a patient with an axillary IABP. There were no significant adverse events while ambulating a patient with axillary IABP. Adverse events include but are not limited to significant bleeding, ischemic events, or IABP malfunction/malposition.

The JH-HLM and the IMS were utilized as outcomes measures within the study. These measures were appropriate for our case report as our goal was to identify the benefit of the axillary IABP with regards to patient mobility and ambulation. The higher number on both scales indicates a higher level of functional mobility.

The JH-HLM was developed based on input from multiple disciplines. The goals, as described by the developers of the scale, were to record the mobility that a hospital patient actually does; to standardize the description of patient mobility; to set individual patient mobility goals; and to develop a performance measure for quality improvement projects. Although the JH-HLM is a useful tool to measure and advance patient mobility, further studies are needed to evaluate the reliability and validity of the scale.

The IMS provides a quick and simple bedside method of measuring mobility milestones in critically ill patients. Tipping et al. noted a significant difference between the IMS at ICU discharge in patients with ICU acquired weakness compared to those without. The construct and predictive validity properties of the IMS support the use of the IMS in the ICU to measure patients' daily mobility level.

Our conclusion is limited to events related to one patient within the cardiac ICU who was mobilized almost daily with an axillary IABP. Regardless of the scale utilized, the patient benefitted from ambulation prior to heart transplant. Scores between the two scales varied based on the amount of physical assistance provided during mobility (IMS) and/or distance ambulated (JH-HLM). It is unsure whether these results could be generalized to a population of patients who had poor mobility before ICU admission. Furthermore, future research should compare the safety and efficacy of mobility with varying IABPs.

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Acute and critical care in the classroom

Designing realistic and effective teaching tools throughout the curriculum

Andrea Attorri PT, DPT
Stephen Bailey PT, PhD, FACSM

OBJECTIVES

Teaching higher level critical thinking, therapeutic interactions with acutely ill or vulnerable patients, and management of complex critical care clinical environments is challenging within the entry-level classroom. Effective learning environments must provide repeated realistic practice of increasing difficulty with opportunities for feedback and reflection. Standardized patients activities have been successfully implemented in entry-level DPT education. Aspects unique to standardized patients (real time, realistic/living person, individualized feedback) lend themselves to the teaching of higher level critical care skills. Standardized patient use alone, however, does not guarantee desired outcomes. The development of case scenarios and the nature of feedback and delivery, for example, are critical to the quality of the learning process. In this poster, we will share educational materials and methods of integrating clinicians into academics, progression of clinical decision making throughout the curriculum, reducing the fear of critical and acute care settings, as well as guiding participants in developing their own effective teaching tools. With the growing frequency of critical care physical therapist practice, it will become essential for DPT education to include successful management of critically ill patients.

METHODS

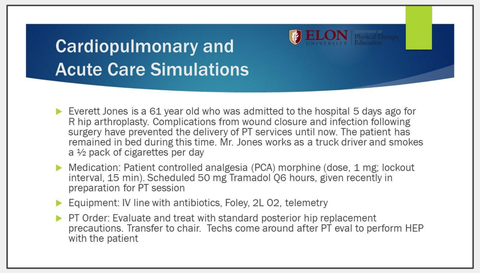
The majority of acute and critical care content is structured into the cardiopulmonary dysfunction course, and taught via the following:

- Strong cardiopulmonary physiology and vital sign interpretation
- Emergency management preparation
- Patient simulations via standardized patients and debriefing with learning objectives
- Feedback from standardized patients, peers, and instructors
- Case scenarios with group polling answers
- Emphasis on clinical decision making

Using these strategically designed standardized patient activities, along with integration of practicing clinicians into the teaching process, we have created learning opportunities that challenge students at multiple levels throughout the curriculum, with positive results. These activities progress in complexity from introductory management of lines and lead to customized, real-time responses to changes in a patient's medical condition via the standardized patient.

PATIENT SIMULATION SCENARIOS

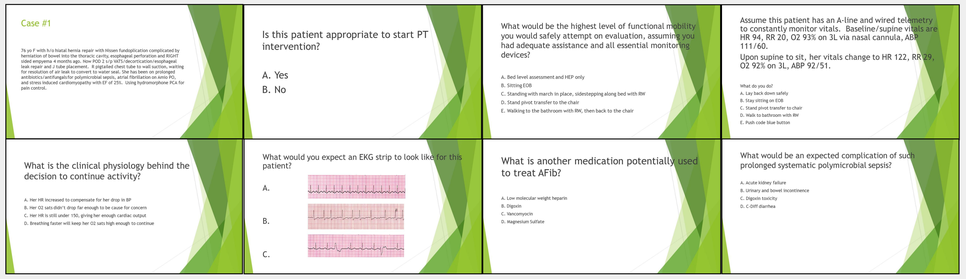
As one teaching tool, throughout the cardiopulmonary course, students are exposed to simulation experiences that progress in complexity and mirror didactic content. Clinical scenarios are written by practicing acute care specialists to ensure current and realistic content is presented in the classroom setting. Each simulation experience comes with crucial learning objectives that better prepare students to provide clinical care.



Scan to view the video of two DPT students performing this patient simulation

CLINICAL DECISION MAKING

Using an audience polling software as another teaching tool, each student has a 'clicker' which allows them to answer questions (such as the ones below), and after all entries are received, a graph shows the distribution of answers. This forces students to commit to an answer and also gives them and the instructors the perspective of the collective thought process of the class. Incorporated in this activity is ECG, pharmacology, physiology, ethics, concepts from simulations, disease and pathology, all of which influence clinical decision making in the acute care setting with medically vulnerable patients.

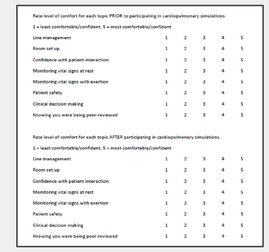


CONCLUSION & DISCUSSION

It is imperative that DPT programs prepare students to successfully manage critically ill patients in the acute and critical care settings. Crucial decision making cannot be taught exclusively from a textbook, nor can it be tested via multiple choice questions. Students must learn how to be safely assertive and take risks for the benefit of the critical care patient. Historically, the extent of clinical decision making for acute and critical care has stopped at "don't hurt the patient" or "do no harm." This approach greatly limits the potential in which physical therapists can intervene for patients' benefits. By teaching safe assertiveness and a strong base of functional cardiopulmonary physiology, students learn to take calculated risks in order to make the most optimal functional gains. With strong didactic content and lab activities to teach physiology, at rest, and especially with activity and in the setting of various disease processes, students become less fearful of treating medically fragile patients. Students who are fearful turn into therapists who are fearful, and therapists working in a critical care setting who are fearful can do more harm than good.

RESULTS

Students demonstrated a statistically significant improvement in all categories of a confidence and skills survey, as seen in the graph below. This positive preliminary data on student improvement in decision making, vital sign interpretation, self-assurance with unstable patients, and various safety skills could be correlated with better prepared entry-level physical therapist practice in the acute and critical care settings. Students identified the following topics as concepts that should be introduced in the classroom prior to any acute care clinical experience: line management, vital sign interpretation, and common acute care diagnoses, procedures, and basic pharmacology.

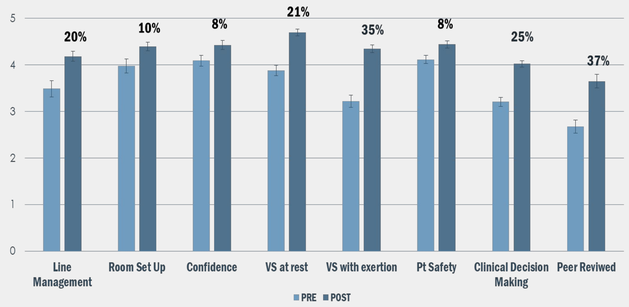

Rate level of comfort for each topic PRIOR to participating in cardiopulmonary simulations.
1 = least comfortable/confident, 5 = most comfortable/confident

Line management	1	2	3	4	5
Room set up	1	2	3	4	5
Confidence with patient interaction	1	2	3	4	5
Monitoring vital signs at rest	1	2	3	4	5
Monitoring vital signs with exertion	1	2	3	4	5
Patient safety	1	2	3	4	5
Clinical decision making	1	2	3	4	5
Knowing you were being peer-reviewed	1	2	3	4	5

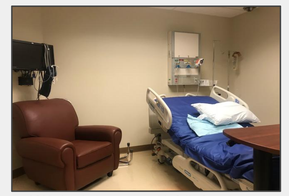
Rate level of comfort for each topic AFTER participating in cardiopulmonary simulations.
1 = least comfortable/confident, 5 = most comfortable/confident

Line management	1	2	3	4	5
Room set up	1	2	3	4	5
Confidence with patient interaction	1	2	3	4	5
Monitoring vital signs at rest	1	2	3	4	5
Monitoring vital signs with exertion	1	2	3	4	5
Patient safety	1	2	3	4	5
Clinical decision making	1	2	3	4	5
Knowing you were being peer-reviewed	1	2	3	4	5

Since questionnaires were collected anonymously, pre and post responses could not be matched for each subject. As a result questionnaire responses were assessed using unpaired t-tests. Bonferroni corrections were made in an effort to minimize the possibility of inflation of alpha. Significance was set *a priori* at p=0.05. Data are presented as mean ±standard error (M±SE).




Elon University's patient simulation observation and control room, complete with viewing screens, real time vital sign manipulation, and ability to speak through the sound system into the simulation room.


ICU simulation room with fully functioning hospital bed, various lines and drains, O2 delivery, vitals monitor, and multi-angle video cameras with recording and viewing capabilities.

Training the Next Generation of Early Mobilization ICU Therapists

Carly Goldberg, MS, OTR/L, Lauren Cohen, MS, OTR/L

NewYork-Presbyterian
Columbia University Medical Center

Learning Objectives

- Identify the skills required for OTs to begin ICU evaluation and treatment.
- Implement a training protocol as therapists begin treatment in the ICU.
- Establish interdisciplinary relationships and educate staff on the role of OT in the ICU.

Abstract Summary

Occupational therapists play a vital role in this early stages of rehabilitation to maximize the patient's functional recovery. As the ICU emerges as a common treatment arena for OTs in the acute care setting, it is necessary to develop clinical resources to help further the practice of beginning therapists. Practicing in the ICU requires a more advanced skill set than is typically covered in an OT masters entry-level program.

Training Methods

- Self-study and research
- Shadowing a senior therapist to observe handling techniques, patient interaction, and interdisciplinary communication
- Co-treating with a senior therapist and having clinical reasoning discussions for topics such as triage strategies, treatment ideas, and appropriate ways to grade activity up and down at the ICU level
- Demonstrating ability to treat independently
- Participating in AM Interdisciplinary rounding and triaging appropriately
- Passing a competency exam

Key Elements for Success

- Ability to synthesize information from the chart, RN, medical team, and patient's current status
- Critical analysis of the patient's status at the time of session
- Development of an appropriate treatment plan given the above
- Understanding of critical vitals in order to provide "just right" challenge within safe parameters

References

- Milner T, Bossers A. Evaluation of an occupational therapy mentorship program. Can J Occup Ther. 2005;72(4):205–11. This paper was published in the CJOT Early Electronic Edition, May, 2005.
- Hodgson, C. L., et al (2014). Expert consensus and recommendations on safety criteria for active mobilization of mechanically ventilated critically ill adults. Critical Care, 18(6), 658.
- Evangelist, M., & Gartenberg, A. (2016). Toolkit for developing an occupational therapy program in the ICU. *SIS Quarterly Practice Connections. 1*(1), 20-22.

Cardiac Competency

Name Year:	Introduced	Performs with Assistance	Performs Independently
Lines/Tubes			
Chest Tube			
External Pacemaker			
Precautions/Contraindications			
Sternal Precautions			
Heart Rhythms			
Normal Sinus Rhythm (NSR)			
Preventricular Contraction (PVC)			
Atrial Fibrillation (Afib)			
Atrial Flutter (A-Flutter)			
Ventricular Tachycardia (V-Tach)			
Ventricular Fibrillation (V-Fib) (Sustain/non-sustained)			
ICU Specific Lines/Tubes			
Arterial Line (Upper and Lower Extremity)			
Cordis			
Swan Ganz Catheter			
Continuous Veno-Venous Hemodialysis (CVVHD)			
Intra-Aortic Balloon Pump (IABP)			
Extracorporeal membrane oxygenation (ECMO)- VA andVV			
Sheaths-after cardiac cath or transfemoral AVR			
Transfers			
Operates Stretcher Chair Safely and Appropriately			
Positions patient safely in preparation for stretcher chair transfer			
Safely and appropriately transfer patient to/from stretcher chair			
Operates mechanical lift safely and appropriately			
Positions patient safely in sling in preparation for mechanical lift transfer			
Positions patient safely in desired seating system/bed/chair			
Ventilation (See Vent Competency)			
Demonstrates proper handling of patient with Endotracheal Tube			
Demonstrates proper handling of patient on Hi-Flow Nasal Canula			
Inhaled Nitric Oxide			
Ventricular Assist Devices			
HeartMate II LVAD			
Heartware LVAD			
Centrimag LVAD			
Centrimag RVAD			
Jarvik (Post Auricular and Intra-Abdominal) LVAD			

Evaluated by:_____
Title:_____
Signature:_____

UTILITY OF MOBILITY IN POST OPEN HEART SURGERY PATIENTS

Alan M. Beck, PhD & Dalton Morgan, BS
Southern Illinois Healthcare, Carbondale IL

6th Annual Johns Hopkins Critical Care Rehabilitation Conference, Baltimore MD

Introduction

Early mobility in Intensive Care Units (ICU) has gained traction in the recent past. Early mobility has been deemed safe and effective for improvement in functional outcomes.[1] In health systems with limited resources, the mobility specialist may be tasked out depending upon patient need and allocated resources. Therefore, other responsibilities outside of the conventional mobility literature may be deemed necessary.

Purpose

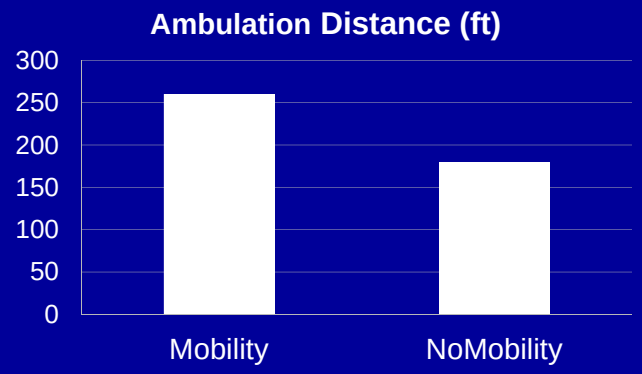
The purpose of the study was to determine the utility of a mobility specialist's impact on post open heart surgery patient's ambulation distance and frequency.

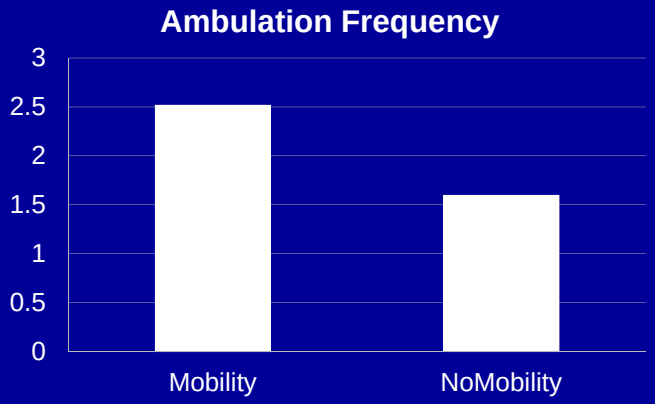
Methods

Data were collected retrospectively for one month on ambulation distance and frequency of post open heart surgery patients from a mid-western rural hospitals cardiovascular intensive care unit. Ambulation was grouped dichotomously based upon personnel present (i.e., Mobility vs. non-Mobility). Independent sample's t-tests were completed on distance and frequency of ambulation.

Measures

- Ambulation distance, frequency, and personnel present were measured.
- Each ambulation was dichotomously grouped into personnel present during the ambulation
  - Mobility specialist present
  - Mobility specialist not present.





Results

- Ambulation distance was significantly greater when the Mobility specialist was present (M = 260.10ft, SD = 271.10ft) compared to non-Mobility personnel (M = 179.10ft, SD = 237.83ft), (t(170) = 2.10 [4.32, 157.60], p = .039).
- Ambulation frequency was significantly greater when the Mobility specialist was present (M = 2.52, SD = 1.57) compared to non-Mobility personnel (M = 1.60, SD = 1.26), (t(41) = 2.16 [.06, 1.81], p = .037).

Conclusion

Findings suggest a mobility specialist increased the frequency and distance of ambulation in post open heart surgery patients. The Mobility specialist provided the impetus for more frequent and distant ambulation. Perhaps yet another novel use of a Mobility specialist in cardiovascular intensive care units.

Reference

1) Adler, J. & Malone, D. (2012). Early mobility in the Intensive Care Unit: A systematic review. *Cardiopulmonary Physical Therapy Journal*, 23(1), 5-13.

WVU Medicine

CAMDEN CLARK MEDICAL CENTER

ICU Rehab in a Small Community Hospital: A Quality Improvement Project

Samantha Bates, MOTR/L, Shannon Farley, PT, DPT, & Laura Riley, M.S., CCC-SLP

OBJECTIVES

- Increase percentage of referrals for Physical Therapy, Occupational Therapy, and Speech Therapy
- Decrease average number of ventilator days
- Decrease average number of days until referral received for Physical Therapy, Occupational Therapy, and Speech Therapy
- Reduce cost of care

SETTING

- Camden Clark Medical Center – 327 bed nonprofit acute care hospital in Parkersburg, WV
- 18 bed Intensive Care Unit
- Average 3.9 ventilated patients per day

METHODS

This QI project took place January – September 2016. Baseline data was collected for three months (January – March). Counter measures were implemented between the months of April – September. Focus was to increase the critical care staff's knowledge of the importance of Physical Therapy, Occupational Therapy, and Speech Therapy through education. Daily rounds were completed between interdisciplinary members of the QI team to determine appropriate patients. Education was provided to the critical care staff, including an update of research on early mobility in the ICU. As therapy was being performed in the room, bedside education was provided if the RN/MD was present. Exclusions in the QI project were those patients who expired in the ICU, or were re-intubated on the same admission.

RESULTS

- Physical Therapy -

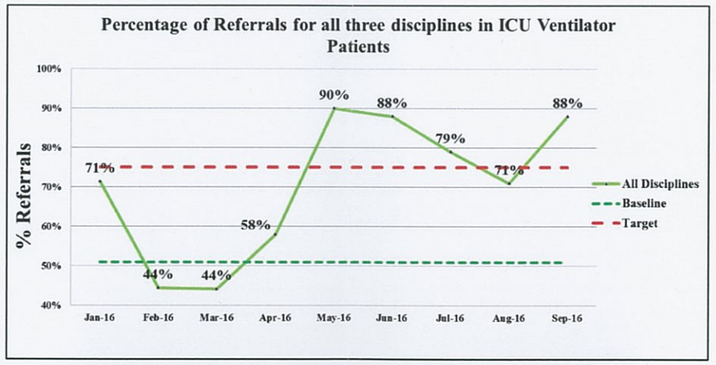
- Percentage of referrals increased from 88% to 91%
- Days until referral received declined from 1.7 days to < 1 day

- Occupational Therapy -

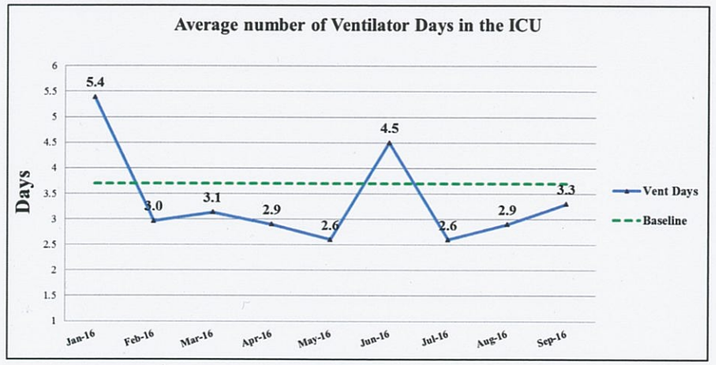
- Percentage of referrals increased from 67% to 84%
- Days until referral received declined from 2.1 days to 1.0 days

- Speech Therapy -

- Percentage of referrals increased from 63% to 85%
- Days until referral declined from 5.4 days to 1.5 days



IMPACT



- Ventilator days decreased from 3.8 days during baseline period to 3.1 days during implementation of rehab services
- Additional per patient costs associated with ventilator dependence at Camden Clark Medical Center averages $1866.00 daily
- Reducing our number of ventilator days by 0.8 days translated to an annual cost savings of approximately $500,000

- Cultural Change -

- Nursing staff and physicians are now aware of the unique differences between each discipline.
- Occupational Therapy and Speech Therapy are increasingly recognized as a standard of care in the critical care setting.
- Each discipline is now initiating therapy earlier with the ventilated patients, helping to reduce ICU acquired weakness, improve communication needs, and begin simple ADLs.
- During this QI project, ICU HCAHPS scores steadily increased from 40.0% to 81.3% by the end of the project.

References

Hopkins RO, Spuhler VJ, Thomsen GE. Transforming ICU culture to facilitate early mobility. Critical Care Clinics (2007); 23: 81-96.

Lord RK, Mayhew CR, Korupolu R, Mantheiy EC, Friedman MA, Palmer JB, & Needham CM. (2013). ICU early physical rehabilitation programs. A financial modeling cost savings. Critical Care Medicine. 41(3); 717-724.

Schweickert WD, Pohlman MC, Pohlman AS, et al. Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomized controlled trail. The Lancet. (2009); 373: 1874-1882.

A Country-wide Educational System for Early Mobilization

Hajime “Katz” Katsukawa[1)] Sho Iida[1)] Kento Tsuchiya [1)] Tomoya Kuroda[1)]

1）Japanese Society for Early Mobilization (JSEM)

1 Introduction

In recent years, staff education has become an increasingly important factor as early mobilization (EM) has spread to many hospitals. Against this background, it is necessary for medical staff to receive education regarding not only basic knowledge of critical care but also clinical skills. The Japanese Society for Early Mobilization (JSEM) has been systematically providing education and training regarding this kind of knowledge for the past 12 years.

3 Purpose

In this presentation, we will share our experience built up over the past 12 years, as well as suggest hints to enable leaders to smoothly educate many staff in their respective countries.

2 About JSEM

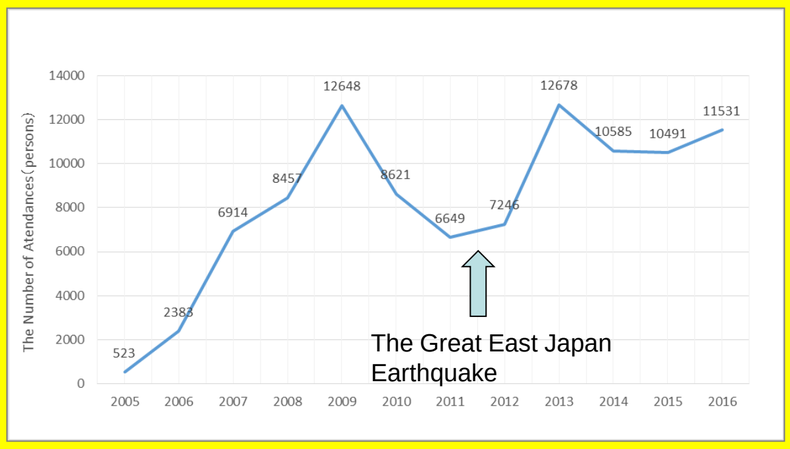
Since 2005

The JSEM is an organization that disseminates information, carries out educational activities, and undertakes academic research with regard to patient mobilization.

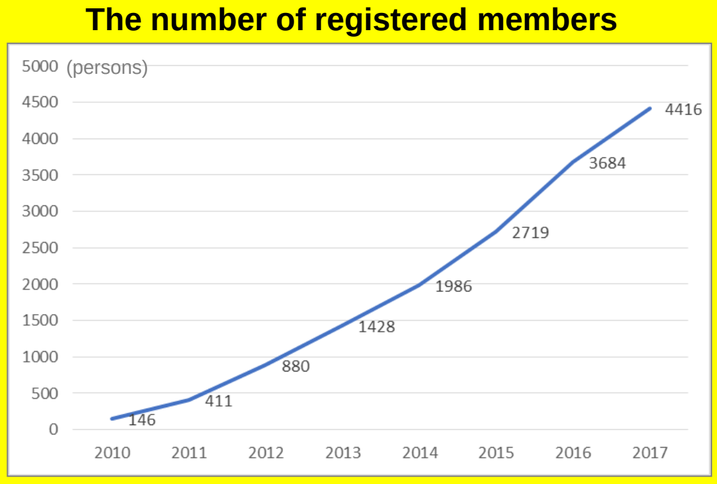
The JSEM has educated more than 110,000 medical staff, and currently has 4,400 registered members.

The Web page of JSEM (English webpage exists.)

The number of attendances of Educational Lecture



The number of registered members



4 5 Factors that have enabled the JSEM to provide education on a continues basis.

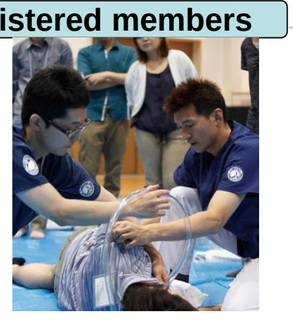
1. Organization

The membership system started since 2010. (Required payment 45 dollars/ year)
The Great East Japan Earthquake occurred on 2011, but the number of attendances increased after the membership system started.

	The average number of attendances
Pre-Membership period 2007-2010	9160 attendances/ year
Post-Membership period 2011-2016	9830 attendances/ year

Benefits for registered members

Journals



Lecture-Fee discount

E-learning

Character Goods

2. High-quality Presentation

All lecturer have to fulfill JSEM’s standard regarding presentation.
The contents of presentation for educational lecture are examined strictly by reviewer.
All lecturer have to improve their presentation based on the result of questionnaire evaluation after lecture.

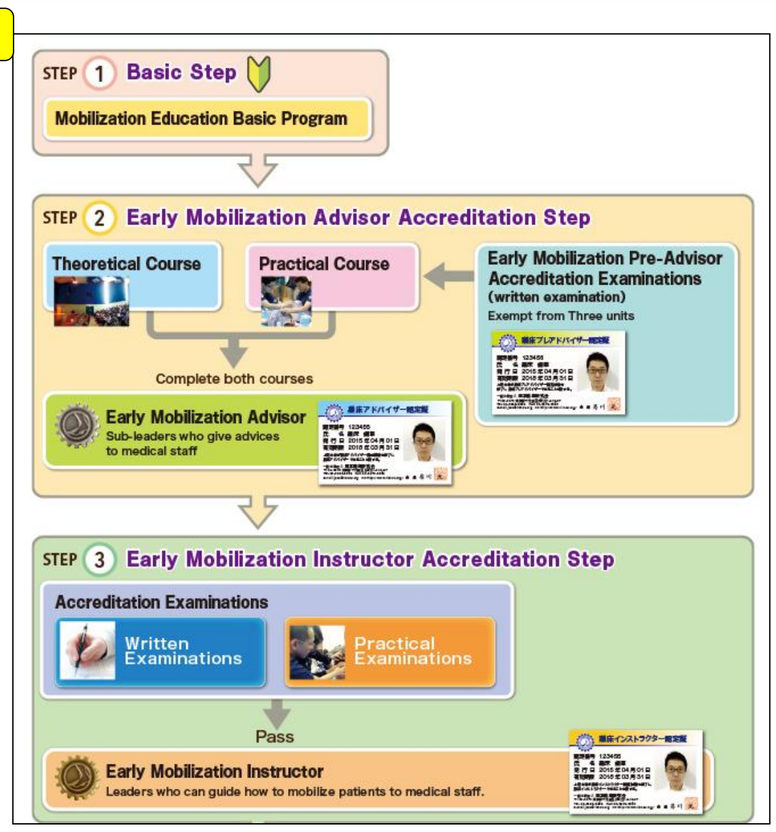
3. Development of Human Resources

The JSEM has established an early mobilization instructor/ early mobilization advisor qualification system since 2013.

Tends in the number of qualified members

	2013	2014	2015	2016
Instructor	0	1	4	6
Adviser	28	61	108	159
Pre-adviser	106	166	242	291

(persons)



The flow chart of qualification

4. Publishing

JSEM was published 7 books regarding EM.
The Early Mobilization Journal has been published every year.

5. Promotion of team collaboration

The JSEM began the E-MAT（Early Mobilization Assistance Team）system as activity of improvement team collaboration.

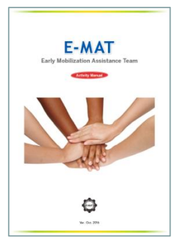
More than 3 persons

More than 2 professions

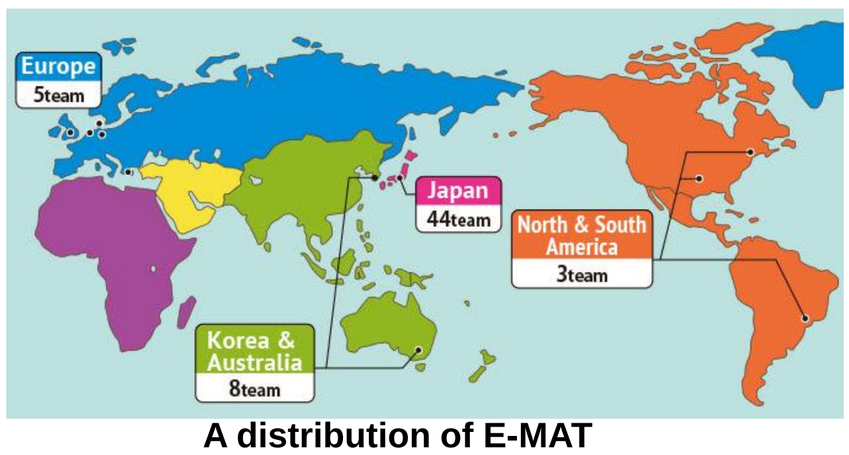
Register with JSEM

E-MAT

By this, you can get..



Sticker Activity Manual



A distribution of E-MAT

You can join to E-Mat now ！

Registration Fee = Free

We think a bundle of those measures is effective for attracting interest of medical staffs.

5 Conclusion

Those factors for continuous education of early mobilization are considered to be critical.
I hope making discussion regarding a effective measure for education of early mobilization today.

Development and Implementation of Pediatric Intensive Care Unit Diary

Herrup EA[1], Wieczorek BH[1], Kudchadkar SR[1]

Department of [1]Anesthesiology and Critical Care Medicine Johns Hopkins Hospital, Baltimore, MD

INTRODUCTION

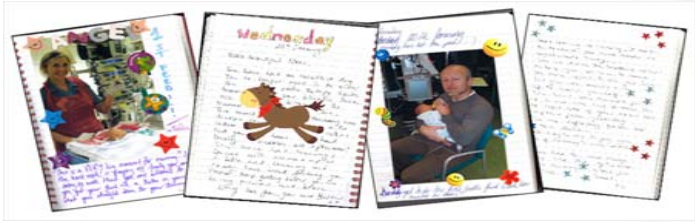
- Postintensive care syndrome (PICS) impacts critically ill children and their families, and includes psychological morbidities such as anxiety, depression and post-traumatic stress symptoms.
- Intensive care unit (ICU) diaries have demonstrated psychological benefits for adult survivors of critical illness and their families.
- The objective of this study was to develop and implement an ICU diary for families of critically ill pediatric patients, and demonstrate the feasibility of implementation in the pediatric ICU (PICU).

METHODS

- The adult literature was reviewed for diary frameworks and a template was created for use in the PICU.
- Staff education included informational sessions, online education and bedside review in real-time.
- Inclusion criteria included families of children with an anticipated length of stay of greater than three days.
- After informed consent, PICU staff were asked to write daily diary entries regarding a patient's major clinical events, and family members were also invited to contribute.
- Photographs of the patients were taken during important moments of their admission with parental/guardian consent.
- Families could keep their PICU diaries upon discharge from the PICU, and a follow-up survey was sent to families two weeks after discharge from the PICU in order to understand how the PICU diary impacted them.

RESULTS

- Families of thirteen patients (n=25 parents/guardians) were enrolled in the initial pilot phase of the study.
- Diary entries were written primarily by bedside nurses with additional contributions by pediatric residents, PICU fellows, PICU attending physicians, and family members.
- All families consented for inclusion of photographs in the diaries.
- Challenges included incorporation of diary writing into a busy PICU clinical workflow, however, the diary experience was well received by families and PICU staff members.



CONCLUSION

- The use of ICU diaries in the PICU setting is feasible and may be a helpful and important tool in improving psychological outcomes of family members of pediatric survivors of critical illness.

What Makes Early Mobilization Different in the Neurologic ICU?

Carly Goldberg, MS, OTR/L

NewYork-Presbyterian
Columbia University Medical Center

Objectives

The purpose of this poster is to outline the differences in the NICU population in regards to early mobilization. New standards and parameters specific to the neurologic population were established for this unit's early mobilization effort. Cognitive therapy as a means of preparation for early mobilization readiness is an important factor in this population.

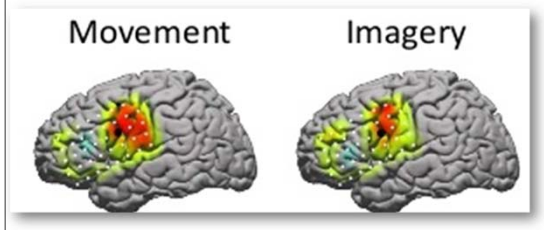
Background

In addition to the parameters for in-bed and out-of-bed exercises established by the expert consensus (Hodgson et al, 2014), mobilization in the NICU also hinges upon a patient's cognitive abilities and readiness. In order to address those patients who might not be ready for the exercise components of the program, the team identifies those patients appropriate to begin working on cognition in preparation for mobilization.

Alternate interventions in the Neurologic ICU

- Arousal
- Attention
- Following commands
- Bedlevel self care
- Calendar activities
- Guided imagery
- Mental practice

These interventions are equally as important for those patients who have central nervous system involvement. The premotor planning areas of the brain have been shown to be active with the thought of movement, therefore patients can participate in preparatory cognitive exercises even if deemed not yet ready for out-of-bed exercises.



Miller et al. (2010)

Conclusions

Although the NICU was the last of the ICUs to have a formal mobilization program, the culture has long been to promote activity and mobilization. Guidelines have been modified for the neurologic population, and cognitive interventions have been recognized as alternatives for those patients who are not yet safe for out-of-bed therapy.

Resources

Hodgson et al. (2014). Expert Consensus and Recommendations on Safety Criteria for Active Mobilization of Mechanically ventilated Critically Ill Adults. *Critical Care*. 18(6) ,658.

Miller, K. J., Schalk, G., Fetz, E. E., Den Nijs, M., Ojemann, J. G., & Rao, R. P. (2010). Cortical activity during motor execution, motor imagery, and imagery-based online feedback. *Proceedings of the National Academy of Sciences*, *107*(9), 4430-4435.

Zink, E. & Geocadin, R (2017). Progressive Mobility Program in a Neuro-ICU: What Makes It Different? *Critical Care Medicine*, 45(6), 1101-1102.

The Mobilization of Multiple Patients Requiring Biventricular Support via CentriMag: A Retrospective Case Study

Allison Kras PT, DPT and Janelle Jablonski PT, DPT

Background & Purpose

Short-term ventricular assist devices (VADs) may be used for emergent intervention to assist in managing patients with cardiogenic shock (CS) (1). The CentriMag pump is an extracorporeal circulatory support device that utilizes a centrifugal pump and has capabilities to be used as a short term right VAD (RVAD), left VAD (LVAD), or bilateral VAD (BiVAD)(2). CentriMag has been approved for use up to 30 days as an RVAD and being evaluated in the United States for use in patients as a bridge to recovery, transplant, and other short and long-term VADs. Currently, the manufacturer recommends against out of bed mobility for patients. However, limited research has been published about mobility, including ambulation, for patients who require CentriMag support (3,4,5,6). The purpose of this report is to describe the safety and progression of functional mobility achieved by three patients with BiVAD CentriMag in situ.

Case Description

- Three male patients with an average age of 49±4 years required BiVAD CentriMag support.
- Patients 1 and 2 were diagnosed with CS and BiVAD CentriMag was utilized as bridge to orthotopic heart transplant (OHT).
- Patient 3 underwent an OHT which was complicated by acute rejection that required BiVAD CentriMag support.
- Patients 2 and 3 initially required support from veno-arterial extracorporeal membrane oxygenation (VA-ECMO) central configuration with oxygenator on right CentriMag, mechanical ventilator, and continuous veno-venous hemodialysis (CVVHD).
- Patients 1 and 2 had no major adverse events while requiring CentriMag support.
- Patient 3 was diagnosed with 2 cerebrovascular accidents, resulting in residual strength and visual impairments. He also experienced seizures while requiring BiVAD CentriMag support.

Figure 1. Patient ambulating with assistance while requiring BiVAD CentriMag support.

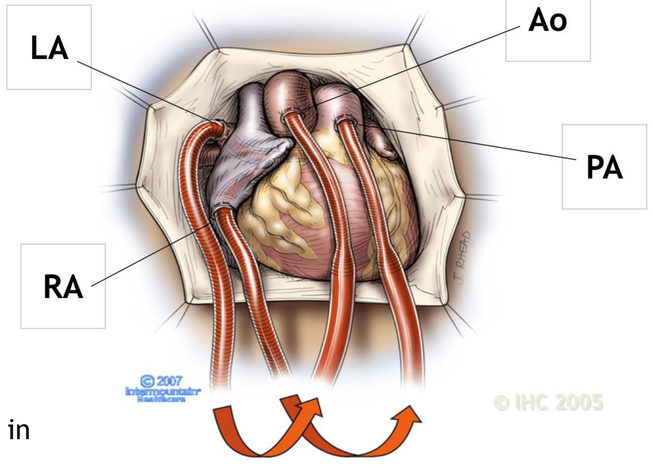


Figure 2. Centrally cannulated BiVAD CentiMag insertion sites

Table 1

	CentriMag Days	PT sessions	In bed	Edge of bed	Transfers	Gait training	Average Distance (feet)	AM-PAC 6-clicks (lowest)	AM-PAC 6-clicks (highest)
Patient 1	94	7	7	7	7	2	135	14	19
Patient 2	82	42	42	38	38	28	252	6	17
Patient 3	206*	82	82	64	63	46	78	7	17
Total	382	130	130	108	107	75	143		

*Patient still required BiVAD CentriMag support at the time of data collection

Outcomes

- Refer to Table 1 for mobility results
- Multidisciplinary input from intensivist, transplant team, physical therapist (PT), and nursing staff was utilized to create an individualized progressive mobility and safety plan for each patient.
- All three patients increased mobility and improved Activity Measure for Acute Care (AM-PAC) 6-click score.
- Outside of PT patients also mobilized with other staff.
- No major adverse events were a result of mobility or PT.
- In all three cases there were notes of CentriMag alarming due to low flow rates; however, in each case alarms were quickly resolved with change in patient position.

Discussion

- With input from a multidisciplinary team, multiple patients who required support from BiVAD CentriMag were able to participate in progressive mobility, including ambulation, without adverse effects.
- All patients in this report were able to make functional gains with PT.
- Patients 1 and 2 discharged home after receiving OHT. However, they likely would have required further inpatient rehabilitation had they been unable to participate in mobility while requiring BiVAD Centrimag support.
- Patient 3 currently requires BiVAD CentriMag support and is actively participating in PT.
- Further research is indicated on mobility and it's implications for patients who require BiVAD Centrimag support.

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Safety of Chest Physiotherapy for Acute Respiratory Distress Syndrome during Venovenous Extracorporeal Membrane Oxygenation: A Case Report

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Introduction

There are few data on chest physiotherapy during venovenous extracorporeal membrane oxygenation (VV ECMO) for acute respiratory distress syndrome (ARDS).

Purpose

In this case report, we evaluated safety of chest physiotherapy (CPT) for an adult patient with acute respiratory distress syndrome (ARDS) during venovenous extracorporeal membrane oxygenation (VV ECMO).

Case description

A male 58 y/o presented with pneumonia (Figure 1.) and septic shock. Initially, the patient experienced abdominal distention and had a bout of diarrhea. He went to bed that night and extreme weakness was noted after waking up next morning but with clear conscious. Therefore, he was send to emergency room at LandSeed Hospital by his family for help.
Duration of ECMO days: 7
Duration of MV days: 14

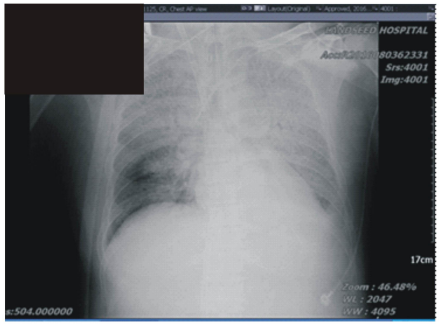

Figure1.Chest X-ray presentation on VV ECMO Day 1

CPT intervention

CPT consisted of chest wall mobilization, rib cage compression, abdominal muscle tension facilitation, ventilator hyperinflation and suctioning (Figure 2). The parameters used to evaluate safety of CPT while the case was on VV ECMO included occurrences of adverse events (i.e., arrhythmia, ventricular tachycardia, cardiac arrest, bleeding, and removal of endotracheal tube or unplanned decannulation) and abnormal vital sign changes.

Treatment	Physiological Effects
Chest wall mobilization	Improved muscle contraction efficiency, ventilation and gas exchange through lengthening of the intercostal muscles. (Ieelarungrayub, 2012)
Rib cage compression	Increasing and redirecting air flow, for pulmonary re-expansion and airway clearance. (Santos, 2014)
Abdominal muscle tension facilitation	To facilitate more effective ventilation. (Perren, 2013)

Figure 2.CPT performed by physical therapist

Results

The reported case received a total of six CPT sessions with no adverse events occurred. The greatest magnitude of systolic blood pressure, diastolic blood pressure, oxygen saturation, heart rate and respiratory rate changes (post-pre CPT) were 6 mmHg, 4 mmHg, 3%, 5 bpm, and 4 breaths/min, respectively (Figure 3).

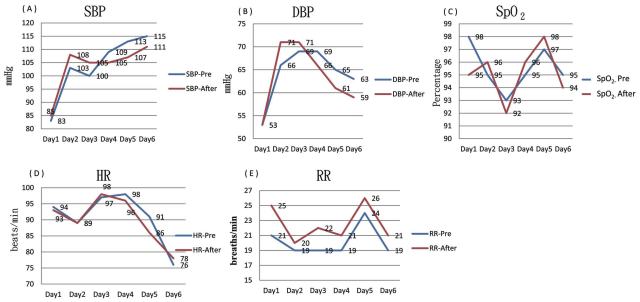

Figure 3. Hemodynamic and vital sign changes during the CPT while the case was on VV ECMO. Legend:
(A)SBP - systolic blood pressure; (B) DBP- diastolic blood pressure;
(C) SpO2- oxygen saturation;(D) HR- heart rate; (E) RR- respiratory rate.

Conclusions

In this case report we demonstrated that routine CPT is safe for patient with VV ECMO. CPT helped to achieve optimal airway hygiene and facilitated cough function recovery in this case. There was no significant adverse event in this case. Thus, we believe it is safe and feasible to perform CPT for patient during VV ECMO.
Future research with larger sample size is needed to confirm the safety of CPT on patients with VV ECMO and further study to assess the impact of CPT on patient recovery after weaning from VV ECMO support is warranted.

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Importance of Early Mobilization in Mechanically Ventilated Oncology Patient Receiving Chemotherapy and Radiation

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The James
THE OHIO STATE UNIVERSITY
COMPREHENSIVE CANCER CENTER

Objectives

- Limited current evidence that examines the importance of early mobilization in oncology ICUs[4].
- Highlight the importance of mobilizing mechanically ventilated patients with cancer.
- Demonstrate how early mobilization helps prevent deconditioning so that patients may safely return home after hospitalization.

Methods

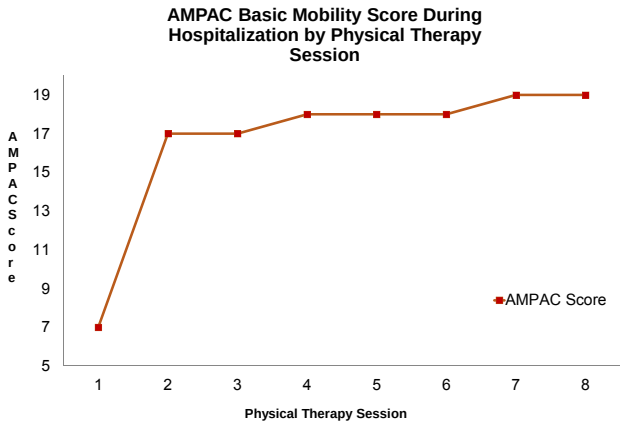
Patient is a 67 year old female newly diagnosed with small cell lung cancer. This required her to be mechanically ventilated greater than 10 days. Physical Therapy was initiated during ICU stay to assist with mobility and prevent deconditioning caused by prolonged hospital course. While intubated, patient progressed from sitting at edge of bed on evaluation to ambulating with use of a walker. As patient's tumor burden reduced, she was extubated and transferred out of the ICU.

Case Description

- Previously healthy, independent 67 year old female
- Past medical history: 100 pack year smoking history, likely underlying COPD
- Hospitalized 19 days, 14 days in the medical ICU
- Mediastinal mass obstructing trachea, which led to acute hypoxic respiratory failure
- Diagnosis: small cell lung cancer with bone metastases to L1
- Bronchoscopy to attempt y stent and open up airway. Unable to ventilate and oxygenate during procedure, patient required intubation.
- Inpatient treatment: Chemotherapy, radiation, PT, OT
- PT and OT initiated ICU day 4 and continued throughout ICU stay
- Tumor burden reduced, patient extubated on ICU day 13
- Patient discharged to home without supplemental oxygen. Additional radiation treatments planned.

Therapy Interventions/Results

- Throughout course of physical therapy, the patient, while intubated was able to progress from two-person assist for bed mobility to stand by assist while ambulating with walker.
- Evaluation day: two person assist for bed mobility and sitting at EOB
- Therapy Progression while ventilated: EOB → bedside chair → ambulating with walker
- Pt ambulated on ICU days 11,12, and 13
- ICU day 14: patient extubated, ambulated with walker, then hand-held assist 400ft
- Transferred to regular nursing floor: supervision with walker, contact guard assist with hand-held assist
- Initiating an early mobilization program allowed the patient to continue to remain active during cancer treatment and prevented deconditioning that occurs with prolonged bedrest during ICU stay.
- Anecdotally, mobilization provided patient with engagement and interaction with staff and family and allowed the patient to actively participate in one aspect of her care.



Conclusion

Prolonged hospitalization can cause deconditioning, muscle weakness, and lead to secondary complications, particularly in mechanically ventilated patients. Chemotherapy and radiation treatments can also contribute to these complications and negatively affect physical function. Performance status for cancer patients can also determine a patient's fitness for tolerating and continuing cancer treatments. Many of these discussions occur in an oncology ICU due to patients' critical illness and co-morbidities. Early mobilization in an oncology ICU can help combat negative effects of bedrest during hospitalization, in addition to improving functional status during cancer treatment. By optimizing rehabilitation during prolonged ICU course, this patient was able to avoid many of the secondary complications of bedrest and return to home[2] to continue with further cancer treatments.

Ambulation on portable ventilator with collaboration from Physical Therapy, Occupational Therapy, Nursing, and Respiratory Therapy.

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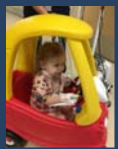
JOHNS HOPKINS MEDICINE



A Quality Improvement Initiative to Optimize Goal-Directed Sedation in the Pediatric Intensive Care Unit

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JOHNS HOPKINS MEDICINE

Introduction

Inconsistent use and evaluation of sedation practices in mechanically ventilated patients in the PICU despite a validated sedation evaluation tool (SBS) which can lead to decreased mobility, increased delirium, ventilator days, increased LOS.

The State Behavioral Scale (SBS) is a validated tool in pediatrics and yields an objective measure for a mechanically ventilated patients' level of sedation. Goal-directed sedation could improve clinician satisfaction as well as decrease morbidity and mortality by allowing for early mobility, decreased delirium and fewer ventilator days.

Objectives

- The objective of this quality improvement initiative was to implement a streamlined process for daily sedation goal-setting during PICU rounds and evaluate the percentage of time that intubated patients are maintained within the ideal sedation range after implementation.

Materials and Methods

Pre-Intervention:

- Chart review of prescriber notes, RN notes and SBS documentation.
- Data collection via PICU Daily Goals Checklist on patients correctly and incorrectly given a goal SBS score on Rounds.
- Survey sent to MD's, NP's, RN's to assess SBS perceptions and utilization.

Interventions/Next Steps

- ✓ SBS Goal added to PICU Daily Goal Sheet.
- ✓ Data collection via safety checklist on patients correctly and incorrectly given a goal SBS score on Rounds.
- ✓ Small group in-person education of SBS scoring and utilization. The groups included; Resident PICU orientation, Nurse Leadership Meeting, Nursing staff meetings, NP meeting, PICU Fellow Meeting, PICU Faculty Meeting.
- ✓ Power Point Education of SBS scoring (with voice over) to rolled out in synchrony with meetings and was also sent to RT staff.
- ✓ Continue Every Kid Every Day Card (reference card) distribution.
- ✓ Continue work with ICU Liberation and PICU UP! working groups.

Post-Intervention:

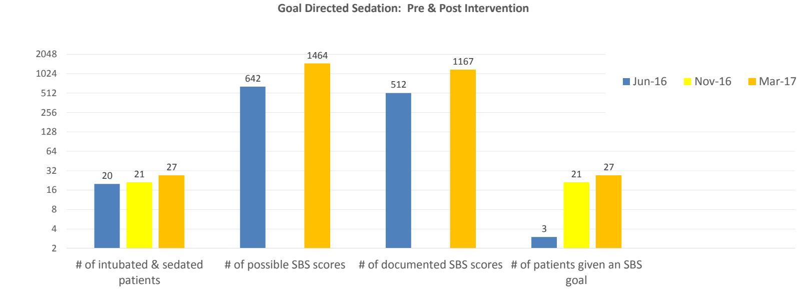
- Pre/Post SBS perceptions Survey of Provider and Nursing Staff.
- Identifying goal SBS on rounds Pre/Post checklist implementation (%).
- Documentation of SBS in Nursing and Provider notes.
- Establish % time spent at goal SBS.

Results

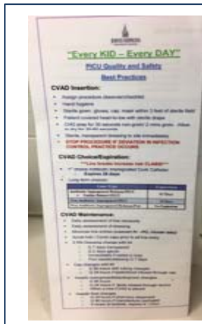
Medscape® www.medscape.com

Score	Description	Definition
−3	Unresponsive	No spontaneous respiratory effort No cough or coughs only with suctioning No response to noxious stimuli Unable to pay attention to care provider Does not distress with any procedure (including noxious) Does not move
−2	Responsive to noxious stimuli	Spontaneous yet supported breathing Coughs with suctioning/repositioning Responds to noxious stimuli Unable to pay attention to care provider Will distress with a noxious procedure Does not move/occasional movement of limbs or shifting of position
−1	Responsive to gentle touch or voice	Spontaneous but ineffective nonsupported breaths Coughs with suctioning/repositioning Responds to touch/voice Able to pay attention but drifts off after stimulation Distresses with procedures Able to calm with comforting touch or voice when stimulus removed Occasional movement of limbs or shifting of position
0	Awake and able to calm	Spontaneous and effective breathing Coughs when repositioned/occasional spontaneous cough Responds to voice/no external stimulus is required to elicit response Spontaneously pays attention to care provider Distresses with procedures Able to calm with comforting touch or voice when stimulus removed Occasional movement of limbs or shifting of position/increased movement (restless, squirming)
+1	Restless and difficult to calm	Spontaneous effective breathing/having difficulty breathing with ventilator Occasional spontaneous cough Responds to voice/no external stimulus is required to elicit response Drifts off/spontaneously pays attention to care provider Intermittently unsafe Does not consistently calm, despite 5-min attempt/unable to console Increased movement (restless, squirming)
+2	Agitated	May have difficulty breathing with ventilator Coughing spontaneously No external stimulus required to elicit response Spontaneously pays attention to care provider Unsafe (biting endotracheal tube, pulling at catheters, cannot be left alone) Unable to console Increased movement (restless, squirming, or thrashing side-to-side, kicking legs)

Source: PCCM © 2006 Lippincott Williams & Wilkins



June 2016: 0% of time spent at goal SBS (Pre)



	Mon.	Tues.	Weds.	Thurs.	Fri.	Sat.	Sun.	Comments
Has the CARDS Scale been reviewed?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Is type/screen needed and ordered?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Can central line be removed?	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	
Can any medications be converted to PO?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Is stress ulcer ppx needed and ordered?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Are drug levels needed and ordered?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Is renal dosing needed and ordered?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Is DVT/VTE ppx needed and ordered? (Admission & Q Tuesday)	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Has lab schedule been reviewed?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Can foley be removed? (Goal: removal before day 5)	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	
VAE prevention in place? (HOB ↑30', oral care Q 4 hours)	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	Yes No n/a	
Are restraints needed and ordered?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Is wound consult needed and ordered? (consult PEDS Wound for new pressure ulcers/wounds)	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Are PT and/or OT consults ordered by Day 3 of admission?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	
Delirium Screen: (patients ≥ 5 years)	+ / - n/a	+ / - n/a	+ / - n/a	+ / - n/a	+ / - n/a	+ / - n/a	+ / - n/a	
Daily SBS Goal	SBS ______	SBS ______	SBS ______	SBS ______	SBS ______	SBS ______	SBS ______	
Daily WAT Goal	WAT ______	WAT ______	WAT ______	WAT ______	WAT ______	WAT ______	WAT ______	
PICU Up Level	Level______	Level______	Level______	Level______	Level______	Level______	Level______	
Is a communication device needed?	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	

Perceptions & Barriers to the use of SBS

SBS Perception Survey: RN Pre & Post-Intervention

	PRE	POST
The SBS helps me objectively assess my patient's status and needs.	Always 16% Sometimes 69% Never 14% 56 Respondents	Always 24% Sometimes 59% Never 17% 29 respondents
The NP and Physician staff set daily SBS goals and discuss them on rounds.	Always 0% Sometimes 38% Never 61%	Always 6% Sometimes 83% Never 10%
I understand the scoring of the SBS and know how to use it.	Yes 91% No 9%	Yes 90% No 10%
What barriers, if any, prevent the use of SBS to discuss sedation goals and/or titration of sedation in our unit?	Barriers to use 51% No Barriers 49%	Barriers to use 45% No Barriers 55%
The education I received was helpful in understanding how to utilize the SBS.		Agree 86% Disagree 10% Comments 3%

SBS Perception Survey: Provider Pre & Post-Intervention

	PRE	POST
The SBS helps me manage the needs of my mechanically ventilated patients.	Always 26% Sometimes 70% Never 4% 23 respondents	Always 30% Sometimes 65% Never 5% 20 respondents
The SBS helps me objectively assess my patient's sedation status and needs.	True 87% False 13%	True 80% False 20%
The NP and Physician staff set daily SBS goals and discuss them on rounds.	Always 9% Sometimes 56% Never 35%	Always 25% Sometimes 60% Never 15%
I understand the SBS and know how to use it.	Yes 83% No 17%	Yes 95% No 5%
What barriers, if any, prevent the use of SBS to discuss sedation goals and/or titration of sedation in our unit?	Barriers to use 72% No barriers 28%	Barriers to use 67% No barriers 33%
The education I received was helpful in better understanding how to utilize the SBS.		Agree 89% Disagree 5% Comments 5%
The SBS scoring is a useful tool in my scope of practice.		Extremely 50% Slightly 35% Neither 15% Useless 0%

Data

- ➢ During the baseline period, 20 patients were intubated and sedated, and only 3 (15%) had an SBS goal documented in a prescriber note. Thirteen (65%) patients had SBS scores consistently (SBS charted at least 50% of time) by the nurse, with documentation rate at all eligible time points of 79% (512/642 scores). The pre-implementation survey revealed that there was a lack of knowledge among all interdisciplinary teams about use of SBS for daily sedation management.
- ➢ After implementation of targeted education about the SBS use for intubated children, 100% of intubated patients had SBS documentation, with 80% of all eligible SBS scores (1167/1464) being completed. Additionally, 100% of intubated and sedated patients received a goal SBS via the ICU checklist. Patients spent an average of 57% of time within the goal SBS range. Post-implementation survey revealed that goals are now consistently set and understood by the interdisciplinary team.

Conclusion

Goal-directed sedation is a critical component of ICU liberation initiatives including early mobilization, and a targeted educational intervention to facilitate sedation goal-setting and consistent interdisciplinary communication was effective.

The incidence, characteristics and side effects of chronic pain in ICU survivors

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Introduction

- Post intensive care syndrome (PICS) is now a widely used term to describe the collection of physical and psychological problems reported by ICU survivors
- Physical problems can include chronic pain which can have a negative effect on quality of life and return to employment [1, 2, 3]
- Chronic pain post ICU can also increase the use of healthcare resources required long after discharge to include pain medication and specialist pain services [3,4]
- Intensive Care Syndrome : Promoting Independence and Return to Employment (InS:PIRE) is an ICU discharge programme which explored the incidence and effect of this chronic pain

Aims

Data from InS:PIRE was used to;

- Observe the incidence, anatomical sites, intensity, and interference of chronic pain in ICU survivors over a 12-month period
- Investigate analgesic use for chronic pain management
- Identify predictors of chronic pain and management of symptoms

Method

- InS:PIRE is a post-ICU multidisciplinary rehabilitation programme which follows up patients up to one year post discharge
- Inclusion criteria: Patients that have been ventilated >72 hours and/or have had a high dependency unit stay >2 weeks
- Participants had interventions with an ICU physiotherapist, consultant and nurse, pharmacist, group psychology sessions and a social prescription session
- Participants attended a weekly exercise class, a one-one musculoskeletal (MSK) assessment and completed the Brief Pain Inventory (BPI) questionnaire
- Quantitative data collected using the Brief Pain Inventory (BPI) and MSK assessment during the programme was extracted and analysed
- Descriptive statistics and paired t-tests provided information regarding intensity and interference
- Logistic regression was used to identify predictors of chronic pain
- Ethics approval was waived as the programme was part of a quality improvement initiative

Results

- Two-thirds (n=31) of InS:PIRE ICU survivors (n=47) complained of a 'new chronic pain' since their ICU admission (Figure 1)

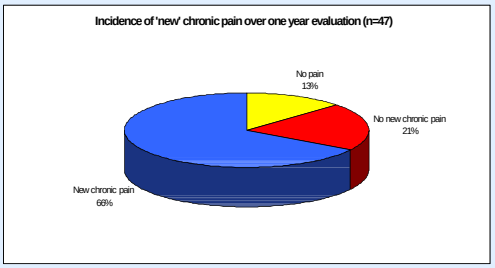

Figure 1. Pie chart of 'new' chronic pain incidence (n=47)

- 'New chronic pain' group demographics included: median age 51 (IQR 44-56); 55% of patients were men; median ICU length of stay 12 (7-27); 58% had sepsis

Results

- The shoulder was the single most frequently affected joint (39%; n=12), especially on the right side and lower limb (LL) pain was high (42%; n=13) (Figure 2)

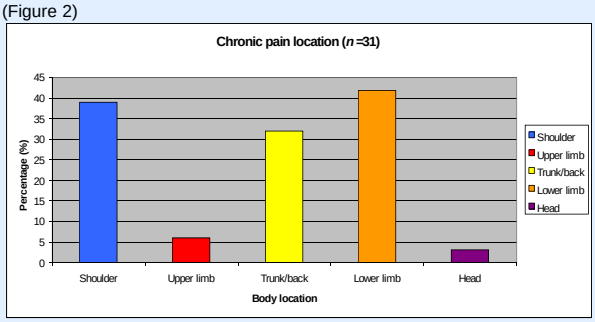

Figure 2. Bar chart of anatomical locations of 'new' chronic pain at baseline assessment

- Pain severity was 'moderate' and did not improve significantly over the year ($p<0.05$)
- Pain interference with life improved over the 12-month period ($p<0.05$) with enjoyment of life and work remaining the most severely compromised
- Prior to admission 43% of patients were taking analgesics and this increased to 81% at the time of their clinic visit
- No significant predictors of chronic pain were found post-ICU

Discussion

- Many contributing factors exist for shoulder pain. Further research could investigate the impact of a prophylactic post-ICU rehabilitation programme
- The bilateral presentation of LL pain may indicate a systemic cause or the body's overall privation of movement for those excluded from mobilisation
- Patients pain at one year was reported to still be 'moderate' however interfered less with their life showing possible better coping strategies and pacing
- Work and enjoyment of life were most severely affected at one year reflecting the need for vocational rehabilitation and specialist pain management services
- Further research should include: a mixed-method; larger sample size; age matched controls from the community and hospital that do not require ICU care

Conclusions

- Chronic pain remains a problem for ICU survivors and future studies should focus on chronic pain as a primary outcome.
- Chronic pain interference does improve significantly over time but patients need appropriate specialist support post ICU
- The BPI can be used in the assessment of chronic pain in ICU survivors.

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Picking up the Pieces

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Background

Patients who survive critical illness and treatment in an Intensive Care Unit (ICU) worldwide often suffer from Post Intensive Care Syndrome (PICS). The syndrome affects the patient's recovery process[1] and at present there is no gold standard for post-ICU follow-up[2].
In an ICU in a University Hospital in Denmark, patients are offered a nurse-led consultation three months post ICU-admission to help them cope with PICS and identify opportunities for further multidisciplinary intervention.

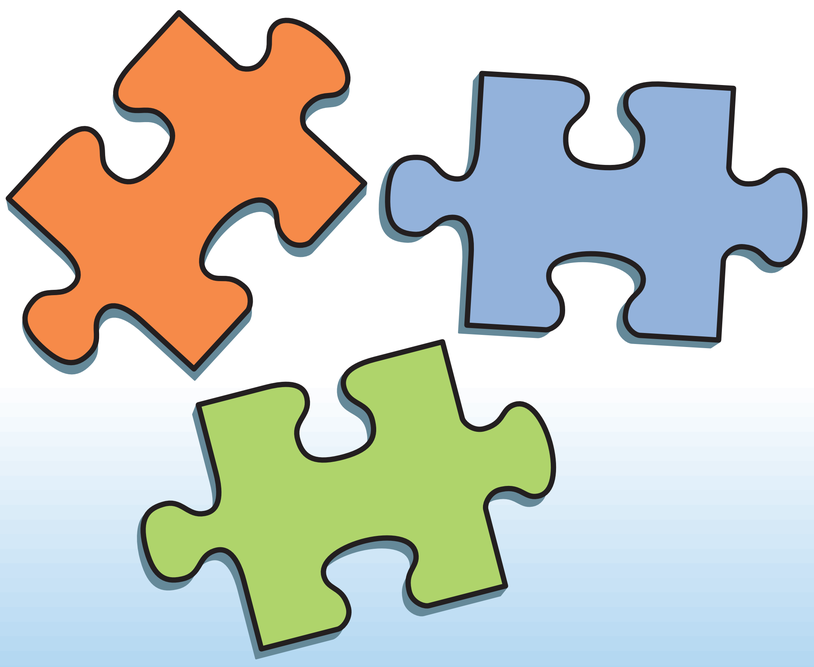
Aims of the study

- To explore the benefits of the consultation with regards to the individual patient's symptoms of PICS.
- To describe former intensive care patients' experiences of the consultation, specifically regarding content and setting.

Methods

- An observational study of the current follow-up consultation.
- A semi-structured interview based upon observations and statements arising from the initial consultation.

Ten adult patients participated in the study.



Results

Four related themes arose regarding benefits of the consultation in relation to the patients' symptoms of PICS:

Confronting the demons:
"Since I revisited the unit and heard the sounds my nightmares have stopped. I guess I closed that chapter in my life" (Female patient, aged 32)

Coming to terms with the reality of having been critically ill:
"When I revisited the unit it dawned on me: I could have been dead. It made me happy to be alive" (Female patient, aged 55)

Making sense of the symptoms:
"The clarity about my hallucinations and taste disturbances, and the fact that I wasn't the only one having these experiences after critical illness. That was the biggest eye-opener for me" (Male patient, aged 67)

Regaining a sense of normality:
"It was a relief to know that I wasn't the only fool having these awful night-mares" (Female patient, aged 55)

Revisiting the ICU and experiencing the setting in person played a huge role in coping after surviving critical illness. Seeing the unit with all its technical equipment and hearing the sounds confronted the patients with their stay in ICU.
During the consultation, problems related to PICS were identified and many patients were referred for further multidisciplinary intervention.
A secondary finding was the importance of involving the relatives. They were the primary source of information for the patients during the time between discharge from ICU and the consultation, and they were an important part of the patient's rehabilitation.

Conclusions

The consultation helped the patients cope with the traumatic event.
The consultation also helped patients understand their symptoms and make sense of what happened during their stay in ICU. An important benefit for many patients was a sense of relief knowing that other patients had experienced the same symptoms.
The consultation should be seen as one part of a multidisciplinary approach to help ICU patients' recoveries.

References

[1]Needham et al (2012). Improving long-term outcomes after discharge from intensive care unit: Report from a stakeholders' conference. Critical Care Med.
[2]Jensen et al (2015). Impact of follow-up consultations for survivors on post-ICU syndrome: a systematic review and meta-analysis. Intensive Care Med.

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CORRELATION OF PRE-SURGERY FRAILTY-RELATED MEASUREMENTS WITH POST-TRANSPLANT OUTCOMES IN PATIENTS AFTER LUNG TRANSPLANT

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INTRODUCTION

Background: Frailty is increasingly recognized as a risk factor for poor outcomes in solid organ transplantation. As much as 10% of the population in need of lung transplantation is frail. Frailty in this population correlates with lung allocation score, disability, removal from the anticipated transplant list and death. The optimal stratification of patient risk for poor transplant outcome by use of formal frailty measures, surgical risk stratification tools, and other benchmark indices, remains unknown. Gait speed, one key frailty measure, is predictive of fall risk, frailty, institutionalization, risk of adverse events (morbidity, mortality, hospital readmission), ambulation level, and functional dependence in geriatric populations.

PURPOSE OF STUDY

The purpose of this study was to determine whether a relationship exists between pre-listing assessment measures, and post-transplant outcomes in patients who underwent a lung transplant. Consensus was achieved among researchers to first examine gait speed with a common ICU metric. **We hypothesized that pre-transplant gait speed correlates with post-transplant ventilator days.**

METHODS

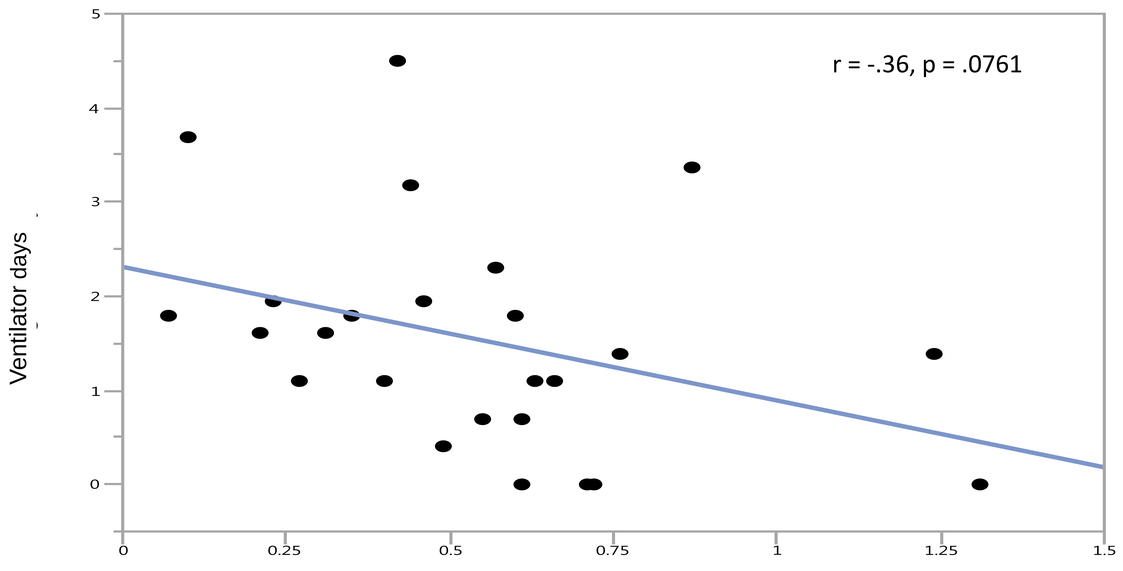
A retrospective chart review of the medical records of 25 consecutive transplanted patients (17 male, 8 female, aged 57 +/- 13.44SD) from the University of Kentucky Chandler Medical Center was performed to examine characteristics related to frailty before and related to outcomes after lung transplant. Data not normally distributed were log-transformed. Pearson's correlation coefficients were determined for pre- and post-transplant variables with statistical significance assumed at $p<0.05$ and clinical significance assumed at $p<0.10$.

DEMOGRAPHICS

	Mean	Standard dev.
Age	56.92	13.44
Gait speed pre-transplant	.64m/s	.28m/s
Percent age predicted gait speed pre-transplant	48	26
Ventilator Days	10.58	19.10
Lung Allocation Score	45.24	13.55

RESULTS

Relationship of Pre-transplant Gait Speed to Ventilator Days



SUMMARY OF RESULTS

Percent of age predicted 6 minute walk gait speed before transplant was correlated with days on the ventilator post-transplant ($r = -0.36$, $p = 0.076$).

DISCUSSION

Patients undergoing lung transplant are thoroughly assessed to prioritize considering waitlist urgency and post-transplant survival. In the studied cohort, gait speed was associated with ventilator days post-transplant with clinical significance.. This finding is consistent with the hypothesis that pre-transplant gait speed is correlated with post-transplant ventilator days. Decreased ventilator days could lead to cost-savings for the institution, decreased functional impairments, and decreased functional decline during hospitalization.

FUTURE STUDIES

- Discuss functional findings
- Compare transplanted to non-listed patients
- Measure muscle loss after transplant
- Evaluating status of all listed patients
- Examine frailty measures, co-morbidities, and psychosocial factors of all patients who underwent workup specifically details of those listed vs not listed
- Build frailty prediction model for lung transplant listing

ACKNOWLEDGMENTS

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Mobility Level as an Indicator of Survival for Patients Requiring Acute Mechanical Circulatory Support via Axillary Impella 5.0

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Background & Objective

Early mobility allows for optimizing the general condition of patients in cardiogenic shock (CS) (1). Several studies have supported the benefits out of bed mobility, including ambulation, for patients while they require acute mechanical circulatory support (AMCS) via axillary Impella 5.0 (1,2,3,4,5). However, these studies have not quantified the mobility levels achieved by patients with CS who require Impella 5.0 support. The purpose of this study is to retrospectively evaluate the mobility levels achieved during physical therapy (PT) among patients with CS requiring an axillary Impella 5.0.

Methods

A retrospective analysis of 19 patients who received an axillary Impella 5.0 device for CS at our institution from 2015-2017 was completed. Beyond medical analysis, mobility was categorized by utilizing the Johns Hopkins Highest Level of Mobility (JH-HLM) Scale to quantify mobility during PT with an axillary Impella 5.0 in situ. Higher scores on a scale of 1 to 8 indicate a higher level of mobility, with 1 indicating lying in bed and 8 indicating ambulation of at least 250 feet. The Activity Measure for Post Acute Care (AM-PAC) 6-Clicks score was collected for each patient to assess their functional status, with a maximum score of 24. "Worsening heart failure" was defined as worsening heart failure/cardiogenic shock with or without device escalation.

Results

- Baseline clinical characteristics were similar between groups (Table 1).
- Compared to non-survivors, survivors achieved a higher maximum JH-HLM score (Figure 1).
- Overall, 10 patients survived and 9 died (Figure 2).
- There were no documented major adverse events as a result of PT or mobilization.

Table 1. Baseline Clinical Characteristics

	Survivors (n=10)	Non-survivors	
		Withdrawal of Care (n=6)	Worsening HF (n=3)
Age (years)	55.4±14.5	66.3±6.5	64±8.2
Admission Ejection Fraction (%)	14.5±5.5	15.8±6.6	21.7±2.9
Duration of Impella Placement (days)	8.1±6.6	12±7.2	8.3±3.1
Lactate (mEq/L)	2.7±3.2	1.6±0.6	1±0.3
Creatinine (mg/dL)	1.8±0.7	1.8±0.8	2.8±0.9
Number of Vasopressors/Inotropes	1.6±0.5	1.4±0.5	1.7±0.6
Right Atrial Pressure (mmHg)	13.9±6	14.3±7.1	15.7±9.6
PA Systolic Pressure (mmHg)	49.2±7.7	51.3±17.1	52±15.6
PA Diastolic Pressure (mmHg)	26.5±7	29.5±11.2	24.7±1.2
Pulmonary Capillary Wedge Pressure (mmHg)	24.1±3.8	26±7.2	21.7±7.8
Cardiac Output (L/min)	4.6±2.6	4.3±1.2	4.7±0.4
Cardiac Index (L/min/m^2)	2.2±1.1	2.3±0.4	2±0.2
Mixed Venous O_2 Saturation (%)	53±12	48.6±7.2	49.2±9.8

JH-HLM Scale

		Score
WALK	250+ FEET	8
	25+ FEET	7
	10+ STEPS	6
STAND	1 MINUTE	5
CHAIR	TRANSFER	4
BED	SIT AT EDGE	3
	TURN SELF/ACTIVITY	2
	LYING	1

MOBILITY LEVEL

Conclusions

- The highest level of mobility achieved after Impella 5.0 implantation using the JH-HLM Score was associated with improved survival.
- Participation in PT alone with an axillary Impella 5.0 in situ did not have an association with improved survival.
- Further study is indicated to investigate the clinical use of mobilization, including exercise, as a therapeutic intervention for patients requiring prolonged AMCS.
- No major adverse events were documented as a result of PT or mobility, thus supporting mobility with axillary Impella 5.0 in situ.

Figure 1. Difference between Survivors and Non-survivors in the JH-HLM and AM-PAC Score

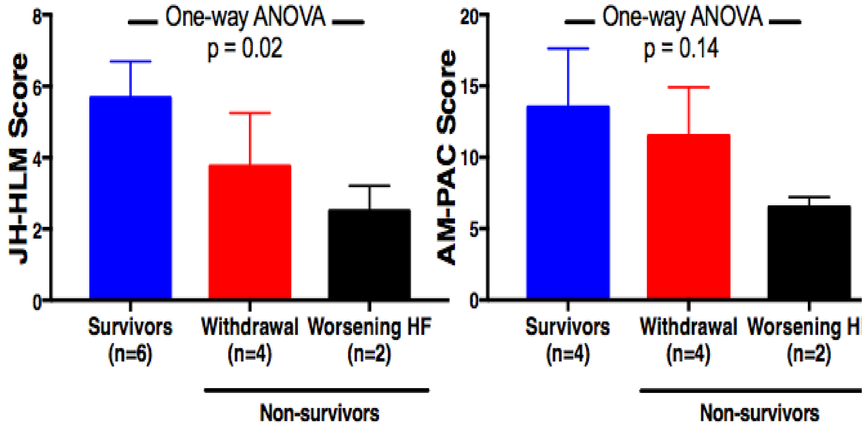
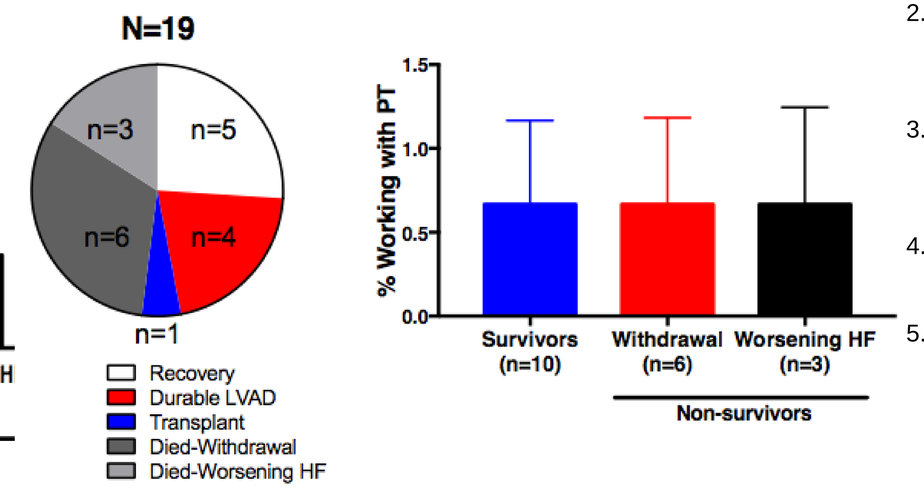


Figure 2. Patient Clinical Outcomes



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