

## Oral Presentations

1. Early Mobility in Patients with Open Abdomens: Is it Safe?  
*Sarah Shatto, MS, OTR/L*  
Affiliation: OSU Wexner Medical Center
2. The Facilitated Sensemaking Model as a Framework to Study a Communication Intervention for Family Caregivers of Mechanically Ventilated Patients in the Intensive Care Unit  
*Jiwon Shin, MSN, RN*  
Affiliation: The Ohio State University, College of Nursing
3. The Role of Animal Assisted Therapy on the Critical Care Unit  
*Emma Jackson, MBCHB (Hons) BSc (Hons)*  
Affiliation: Blackpool Victoria Hospital
4. Sustainability of an Early Mobilization Program in a Pediatric Intensive Care Unit: A Qualitative Analysis of PICU Up!  
*Ruchit V. Patel*  
Affiliation: Johns Hopkins University - Krieger School of Arts and Sciences
5. WEEMOVE: Development and Implementation of a Pediatric Inpatient Early Mobilization Protocol in the Cardiac ICU  
*Sarah Eilerman, PT, DPT*  
Affiliation: Nationwide Children's Hospital
6. Together We're Better: Multidisciplinary Daily Targeted Therapy Rounds to Optimize Patient Outcomes in Surgical Intensive Care Units  
*Lindsay Riggs, PT, DPT*  
Affiliation: The Ohio State University Wexner Medical Center/The James Cancer Hospital
7. Strong Today, Stronger Tomorrow: Creating a culture of early mobility in the Medical Intensive Care Unit  
*Kristen Clifford, RN*  
Affiliation: Vanderbilt University Medical Center

8. Remaining Limitations of Everyday Activities in Patients Who Were Treated in the Intensive Care Unit

*Therese Lindberg, M.Sc., Reg OT*

Affiliation: Function Area Occupational Therapy and Physical Therapy Karolinska University Hospital, Stockholm Sweden

9. Prolonged Mechanical Ventilation Weaning at Long Term Acute Care Hospitals: Does Mobilization influence outcomes?

*Heather L. Dunn, PhD, ACNP-BC, ARNP*

Affiliation: University of Iowa

10. Geisinger's Post ICU Survivor Clinic - First Year Cohort Outcome

*Karen Korzick, MD, MA*

Affiliation: Geisinger

11. First Aid Kit for PICS (Post-Intensive Care Syndrome)

*Bo Van den Bulcke, MSc, Phd student*

Affiliation: Ghent University Hospital

## Poster Presentations

1. Comparison of Healthcare Professionals Experiences of the Use of Patient Diaries from Two ICU's  
*Louise Roberts, RN*  
Affiliation: Cambridge University Hospitals NHS Foundation Trust
2. Promoting Cognitive Function with Lighter Sedation Improves Outcome from Critical Illness Requiring ECMO Support  
*Frances Gilliland, DNP, CPNP-AC/PC*  
Affiliation: Johns Hopkins All Children's Hospital
3. Progress of Early Mobility Program in Oncology ICU over 2-Year Period Unit  
*Lindsay Riggs, PT, DPT*  
Affiliation: The Ohio State University Wexner Medical Center/The James Cancer Hospital
4. INFINITY ∞ Breathless: Art Project with Patients in the ICU  
*Bo Van den Bulcke, Phd student, MSc*  
Affiliation: Ghent University Hospital
5. A Case Study: Can Early Mobilization be Done Safely in a Complex Cardiac Patient with a Congenital Disease?  
*Marisa Glasser, MPT*  
Affiliation: New York Presbyterian Hospital: Columbia Irving
6. Development of a Nurse-Driven Early Mobility Protocol in the Intensive Care Unit  
*Elizabeth Zook, BA, BSN, RN, CCRN*  
Affiliation: Wellspan Ephrata Community Hospital
7. An Approach to the Safe Mobilization and Early Rehabilitation of Patients on ECLS with Mediastinal Cannulation Using TIME-OUT  
*Rebecca West*  
Affiliation: The Hospital for Sick Children
8. Exploration of Healthcare Professionals Experiences Following the Implementation of Electronic Patient Diaries into ICU  
*Joanne G. Outtrim, RN*  
Affiliation: Cambridge University Hospitals NHS Foundation Trust

9. Mobility Progression of a Critically Ill Pediatric Patient with ECMO as a Bridge to Recovery  
*Jessica Cornman, PT, DPT, PCS*  
Affiliation: UF Health Shands Hospital
10. ICU Delirium Documentation in the EHR, a Medical Student QI Project  
*Karen Korzick, MD, MA*  
Affiliation: Geisinger
11. Professional Advice about Avoiding Sedentary Behavior During Hospitalization on the level of Physical Activity, Mobility and Muscle Strength in the older adults; Randomized Control Trial  
*Ivens W.S. Giacomassi, PT*  
Affiliation: University Medical Center
12. Diaries for Patients on Intensive Care Units Reduce the Risk for Psychological Sequelae in Patients and Their Relatives: Systematic Literature Review and Meta-Analysis  
*Peter Nydahl, RN MScN*  
Affiliation: Nursing Research, University Hospital of Schleswig-Holstein, Germany
13. Development of a Femoral ECMO Mobility Protocol: Do the Benefits Outweigh the Risks?  
*Michelle C. Cangialosi, PT, DPT*  
Affiliation: UF Health Shands Hospital
14. ICU Nurses Experience Prior to Introduction of Patient Diaries  
*Joanne G. Outtrim, RN*  
Affiliation: Cambridge University Hospitals NHS Foundation Trust
15. “Pain Relieved, but Still Struggling” - Critically Ill Patients’ Experiences of Pain and Other Discomforts During Analgosedation  
*Helene Berntzen, RN, MSN*  
Affiliation: Oslo University Hospital, Division of Emergencies and Critical Care
16. Electronic Health Record Tool to Promote Team Communication and Early Patient Mobility in Intensive Care  
*Robert J Anderson DNP, AG-ACNP, CNP, RN, CCRN*  
Affiliation: Mayo Clinic – Rochester, MN



17. Acute Care Therapists Leading Change In Patient Care Initiatives: A Transformation In Hospital Infection Control Practice  
*Roslyn M. Scott, PT, MPT*  
Affiliation: Baylor Scott & White Institute for Rehabilitation at Baylor University Medical Center
18. My ICU Diary and EMDR Technique to Alleviate Anxious Nightmares  
*Bo Van den Bulcke, Phd student, MSc*  
Affiliation: Ghent University Hospital
19. Establishing Safe and Effective Mobilization For Patients With a Novel Temporary Mechanical Circulatory Support Device  
*Elizabeth Appel, PT, DPT*  
Affiliation: RUSK Rehabilitation at NYU Langone Health
20. Physical Therapy and Early Mobility in the Neonate on ECMO  
*Ana Maria Jara, PT, DPT*  
Affiliation: John Hopkins All Children's Hospital
21. Korean Nurses' Perceived Barriers and Educational Needs for Early Mobilization of Critical Ill Patients  
*Changhwan Kim, RN, MSN*  
Affiliation: Department of Critical Care Nursing, Samsung Medical Center, Seoul, Republic of Korea
22. Rehabilitation Consultation Patterns in Medical Intensive Care Unit  
*Andrew D. May, MA*  
Affiliation: Johns Hopkins University School of Medicine Department of Physical Medicine & Rehabilitation
23. Implementation of a CVICU Family Diary  
*Jane C. Whalen DNP, RN, CCRN, CCNS-CSC*  
Affiliation: TriHealth Good Samaritan Hospital
24. Addressing Post-Intensive Care Syndrome through Implementation of ICU Diaries and Support Groups  
*Kelly Drumright MSN, RN, CNL*  
Affiliation: Tennessee Valley Healthcare System VA Medical Center

25. Measurement and Rehabilitation of Cognitive Dysfunction in the Critical Illness Recovery Hospital Setting

*Amanda Dawson, PhD*

Affiliation: Select Medical

26. Early Mobility of a Mechanically Ventilated Pediatric Patient with a Complex Medical History: A Case Report

*William Siesel, DPT*

Affiliation: Johns Hopkins All Children's Hospital

27. The "Healingwalks" Project: The Critical Patient in Contact with Nature

*José Carlos Igeño Cano*

Affiliation: San Juan de Dios Hospital - Cordoba, Spain

28. Physical Therapy Management of a Complex Cardiac Patient With Vocal Cord Paralysis

*Katherine Traditi, PT, DPT*

Affiliation: RUSK Rehabilitation at NYU Langone Health



# Early Mobility in Patients with Open Abdomens: Is it safe?

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Sarah Shatto, MS, OTR/L

Ashley Hennen, PT, DPT

Daniel Vazquez, MD



THE OHIO STATE  
UNIVERSITY  
WEXNER MEDICAL CENTER

# Disclosures

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We have no financial or other conflicts of interest to disclose.

# What is an Open Abdomen?

*(Martin & Sarani, 2018)*

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- “Open abdomen” refers to a defect in the abdominal wall that exposes the viscera.
- Frequently used in damage control surgery in trauma, sepsis, significant soft tissue defect and abdominal compartment syndrome.
- Management techniques include temporary abdominal closure systems, goal of assisting with achieving fascial closure.
  - Wittmann patch and NPT assist with fluid management and heat loss until primary closure or graft coverage achieved.

# Wittmann Patch

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- Wittmann Patch: two sheets of Velcro<sup>®</sup>-like material sutured to midline fascia edges.
- The sheets can be tightened as edema improves to approximate fascial edges to progress patient toward primary closure. (Hope and Powers, 2016)

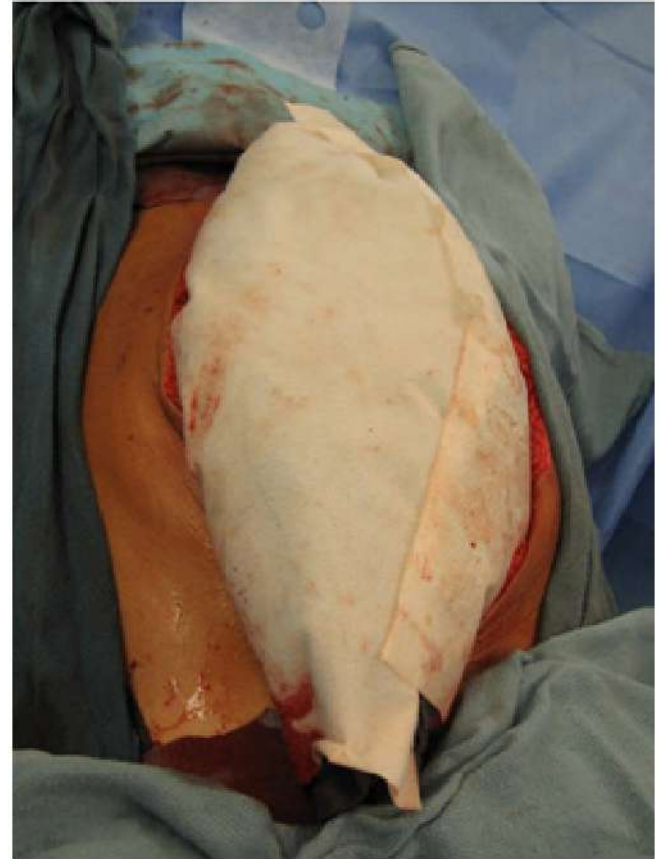


Figure 1, Ref 3: Wittmann Patch closure for open abdomen

# Negative Pressure Therapy

- NPT: includes a polyethylene sheet that acts as a visceral retractor, a polyurethane sponge placed above the sheet in wound, and an adherent dressing placed over sponge with suction tubing attached to vacuum pressure machine.
- Potential benefits of NPT include: easy access to abdomen for repeat procedures, medial abdominal tension, limits fascial retraction, reduces edema and removes infected material and fluid from abdomen, as well as protects viscera from external environment. (Hope and Powers, 2016)

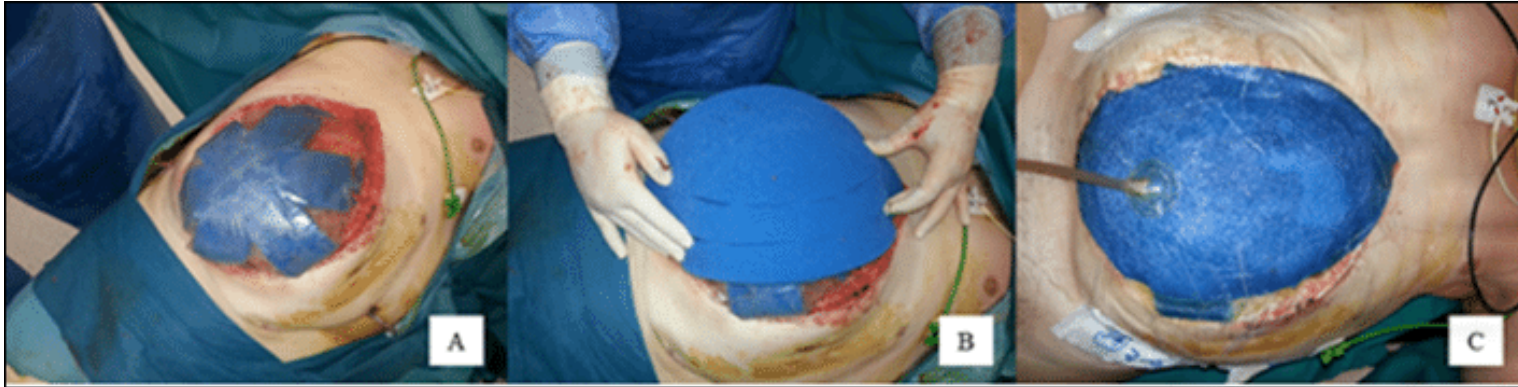


Figure 2, Ref 1. NPT dressing for open abdomen

# Mesh

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- Mesh is sutured to fascial edges to allow granulation tissue to develop to potentially support grafting, sometimes used in conjunction with wound vac therapy. (Hope and Powers, 2016)
- Early mesh placement is used as a definitive treatment, with intent of granulation tissue formation for healing.

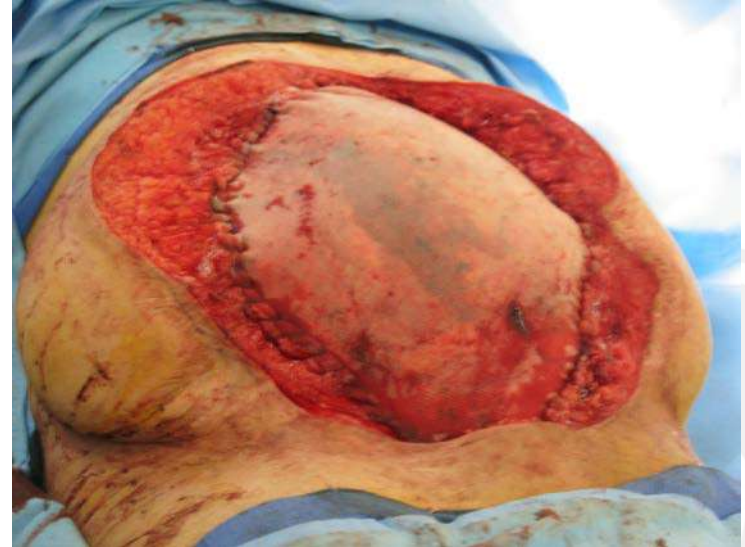


Fig 3, Ref 5. Management of open abdomen with mesh



# History of Care

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- Historically patients in intensive care units with open abdomen and temporary abdominal closure systems were to remain on bedrest throughout time from initial surgery to primary closure.
- Neuromuscular blockade usage was thought to facilitate primary closure of an OA by decreasing intra-abdominal pressure.
  - Neuromuscular blockade usage was not statistically significant at predicting primary closure. NMBA is not favorable to use in the ICU setting due to the risk of ventilator associated pneumonia, peripheral nerve injury, skin breakdown, thromboembolic complications and neuromyopathy. (Regner et al., 2011)

# Purpose

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- No research has been found to support or promote avoidance of mobilization in this population.
  - “Early mobilization of critically ill patients improves outcomes, but mobilizing a patient with an open abdomen has been untested.” (Martin & Sarani, 2018)
- With current research proving benefit of early mobility in critically ill populations, can the standard of care in patients with open abdomen include early mobilization?

**Is it safe to mobilize patients with an open abdomen?**

# Method

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- Patients with OA appropriate for therapy sessions were identified based on information from daily mobility rounding with SICU physician team.
- Inclusion criteria: hemodynamic stability, following commands
- Exclusion criteria: escalating pressor requirement, tenuous respiratory status, cardiac arrhythmias, patient not able to follow commands, wound site bleeding, loss of suction from NPT system, patient in discontinuity

# Patient Sample

*Data Collection: March 2018-September 2018*

*Total of 12 patients, 22 evaluation/treatment sessions completed*

Characteristics	
Age, yr, mean, range	55 (40-89)
Weight, lbs, mean, range	244.59 (145-349)
Height, inches, mean, range	66.86 (62-75)
Males, n (%)	9 (40.91)
Mech Ventilation, n (%)	11 (50)
Type of Closure	10 Mesh
	10 Negative Pressure Therapy
	2 Wittmann patch
Diagnosis	7 Bowel perforation
	3 Colitis
	3 SBO
	3 Abdominal compartment syndrome
	2 Chronic wound infection of abdomen
	2 Mesenteric ischemia
	1 GI bleed
	1 Peritonitis

# Procedure

## *Evaluation and Progression of Activity*

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- Patients seen for initial evaluation within 24 hours of order placement, therapist set frequency for subsequent treatment sessions while admitted in ICU.
- Patient dressing site observed for bleeding prior to initiation of bed mobility/transfers, if NPT being used suction assessed.
- Individual treatment sessions provided to patients with initial goal of patient sitting EOB, progression to standing/chair as tolerated by patient.
- Patient ADL's encouraged at EOB to promote functional task completion as tolerated to assist with delirium management if indicated.

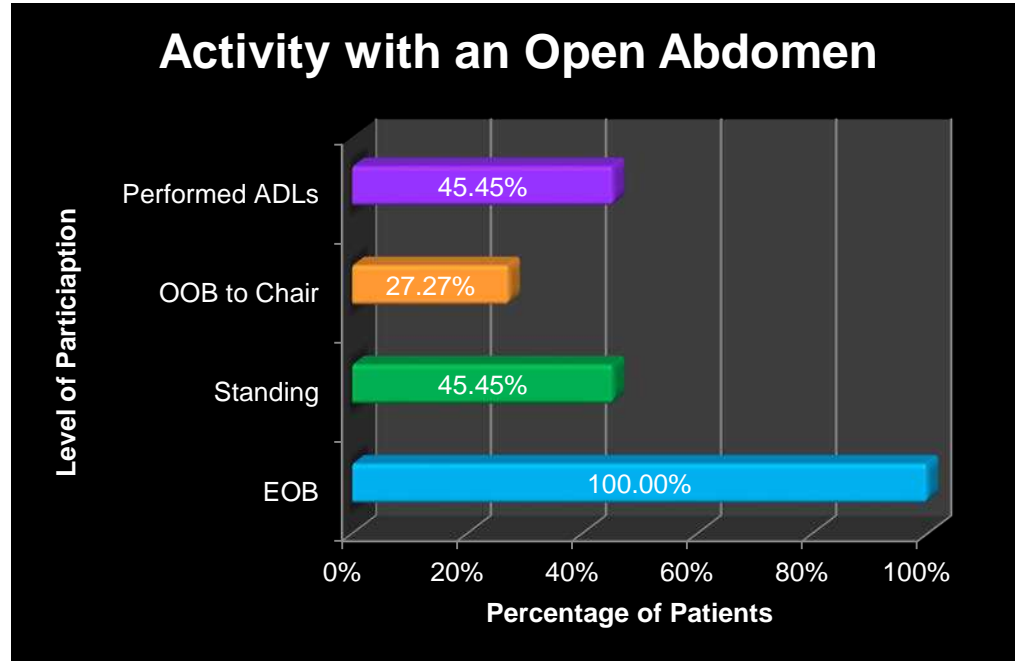
# Adverse Reactions Assessed

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- Loss of NPT suction
- Prolonged desaturation without spontaneous recovery
- Hyper/hypotension requiring medical intervention
- Cardiac arrhythmias requiring medical intervention
- Loss of dressing integrity
- Wound dehiscence
- Evisceration

# Results

*Total of 12 patients, 22 evaluation/treatment sessions completed*



# Discussion

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- In current sampling, no adverse reactions occurred over 22 sessions.
- Patients in sample were able to participate in standard post surgical mobility protocols as appropriate.

## Limitations:

- Small sample size, with current data gathering ongoing
- Data not sensitive to decrease in ventilation days/decrease LOS (due to multiple repeat procedures maintaining vent)
- Data not sensitive to mobility affecting increase or decrease in days to primary closure



# References


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# Thank You



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# The Facilitated Sensemaking Model as a Framework to Study a Communication Intervention For Family Caregivers in the Intensive Care Unit.

2018 Annual Johns Hopkins Critical Care Rehabilitation Conference

Ji Won Shin, MSN, RN; Mary Beth Happ, PhD, RN; Judith Tate, PhD, RN

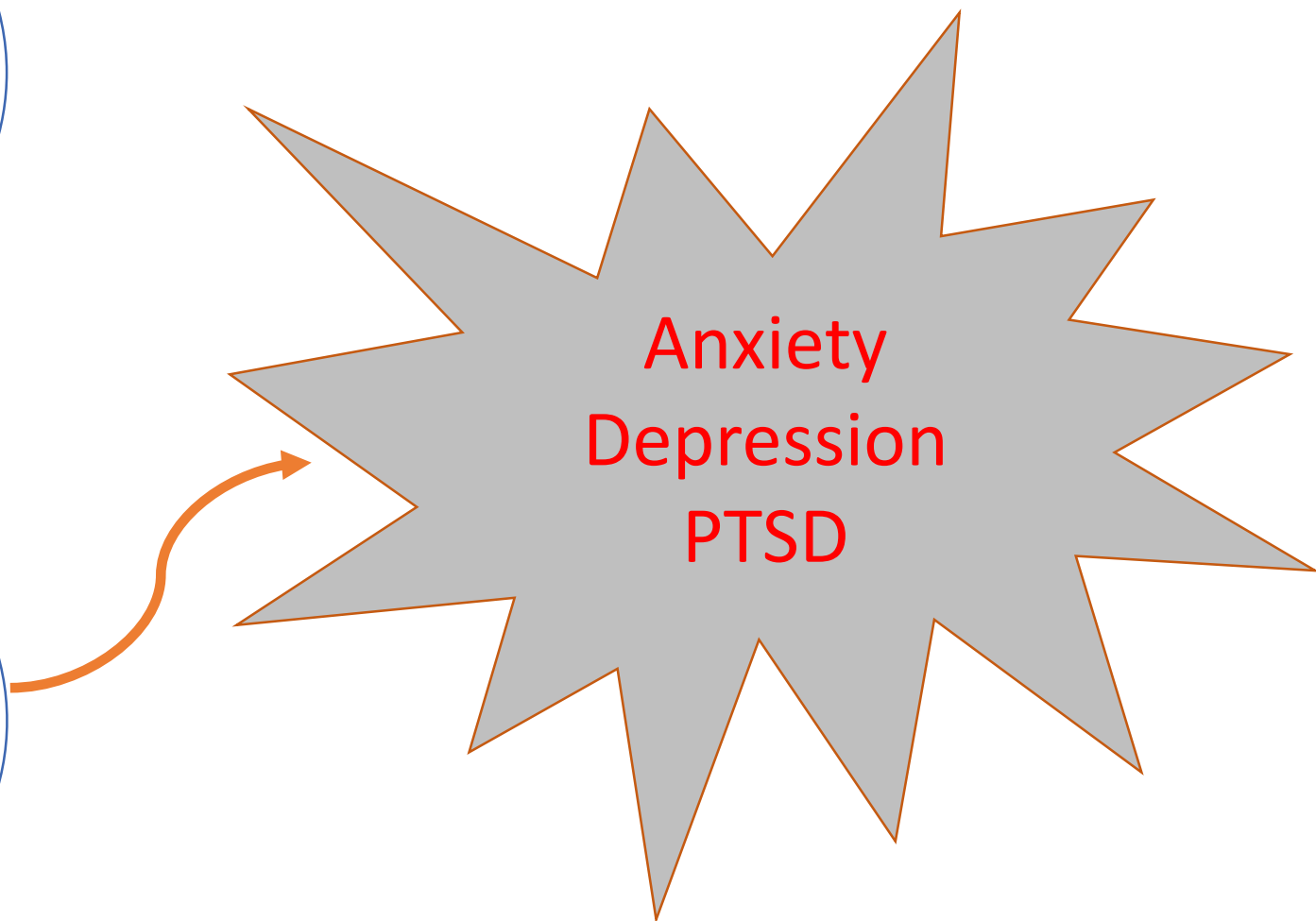
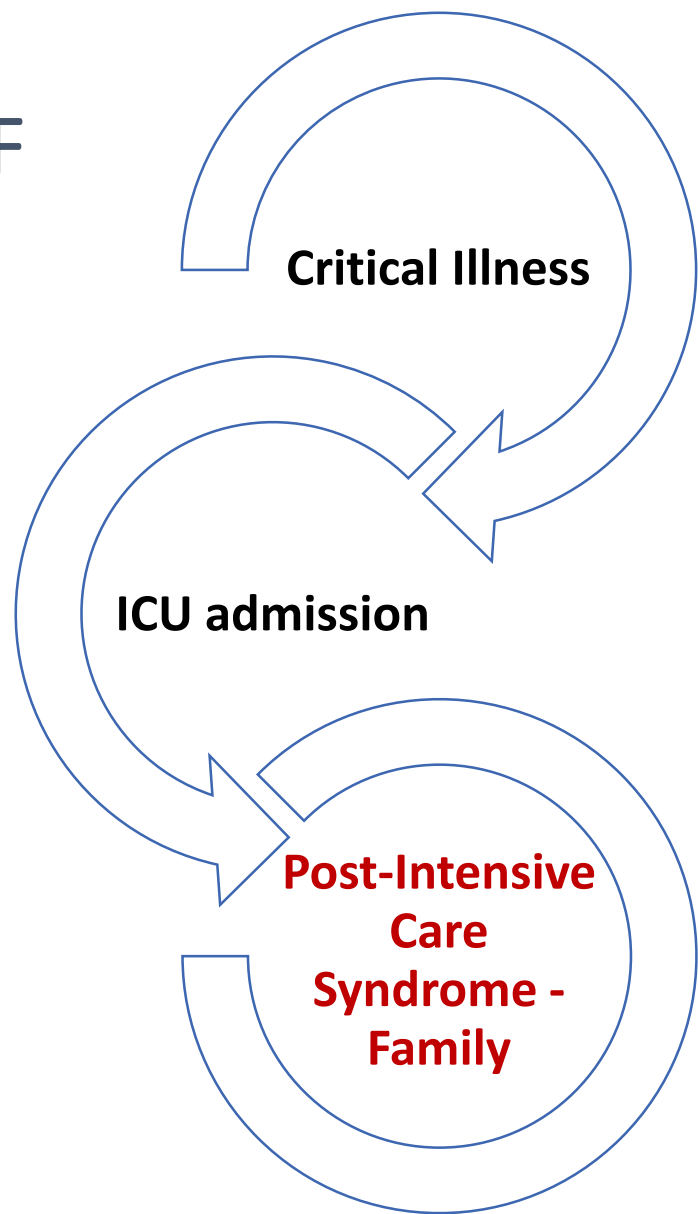


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# Significance

Lifetime  
prevalence in  
general population

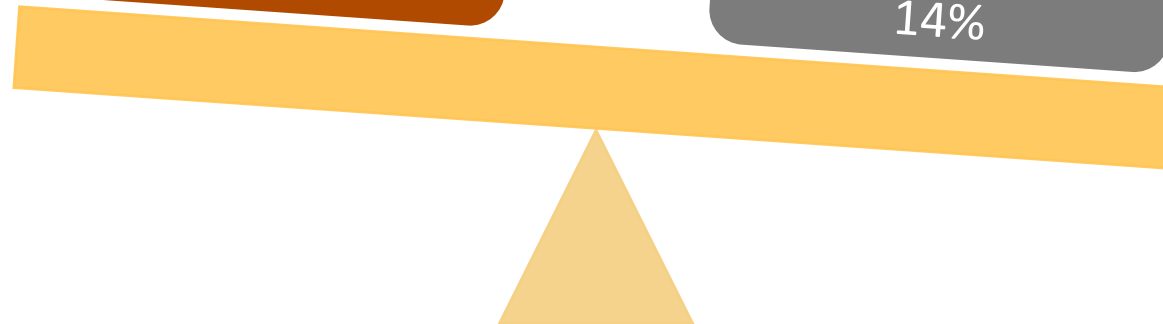
Long-term  
prevalence in ICU  
family caregivers

Depression  
8-15%

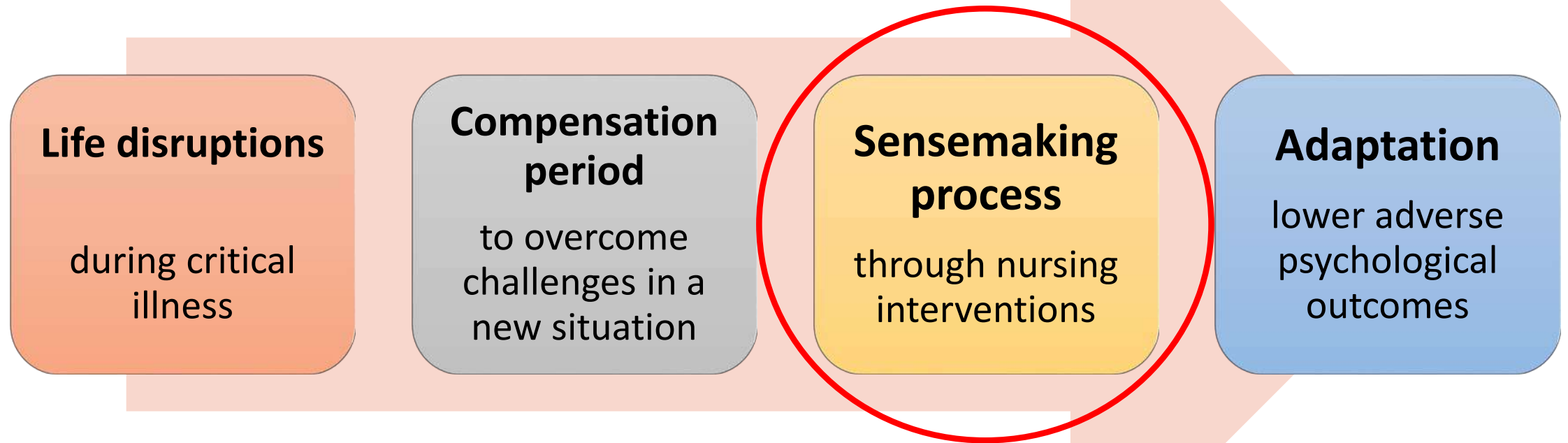
Depression at 1yr  
post-ICU care  
23-43%

PTSD  
6.8%

PTSD at 2 yr post-  
ICU care  
14%

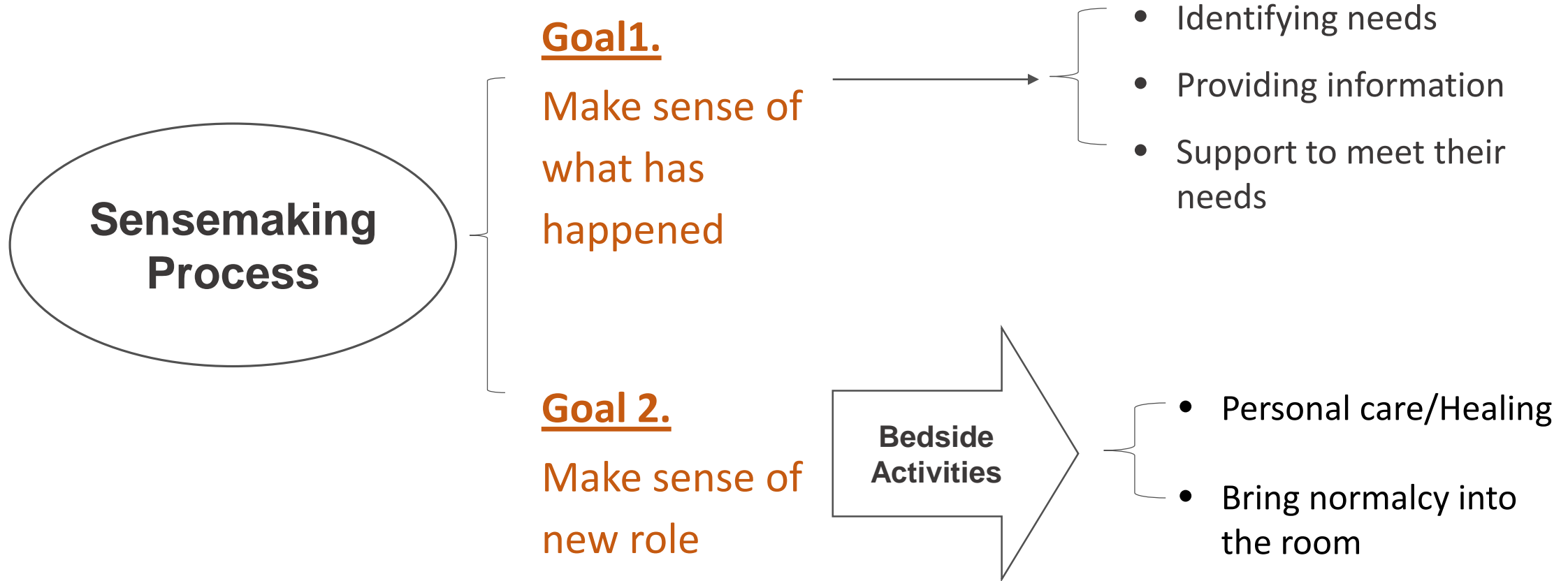


## The Facilitated Sensemaking Model (FSM)



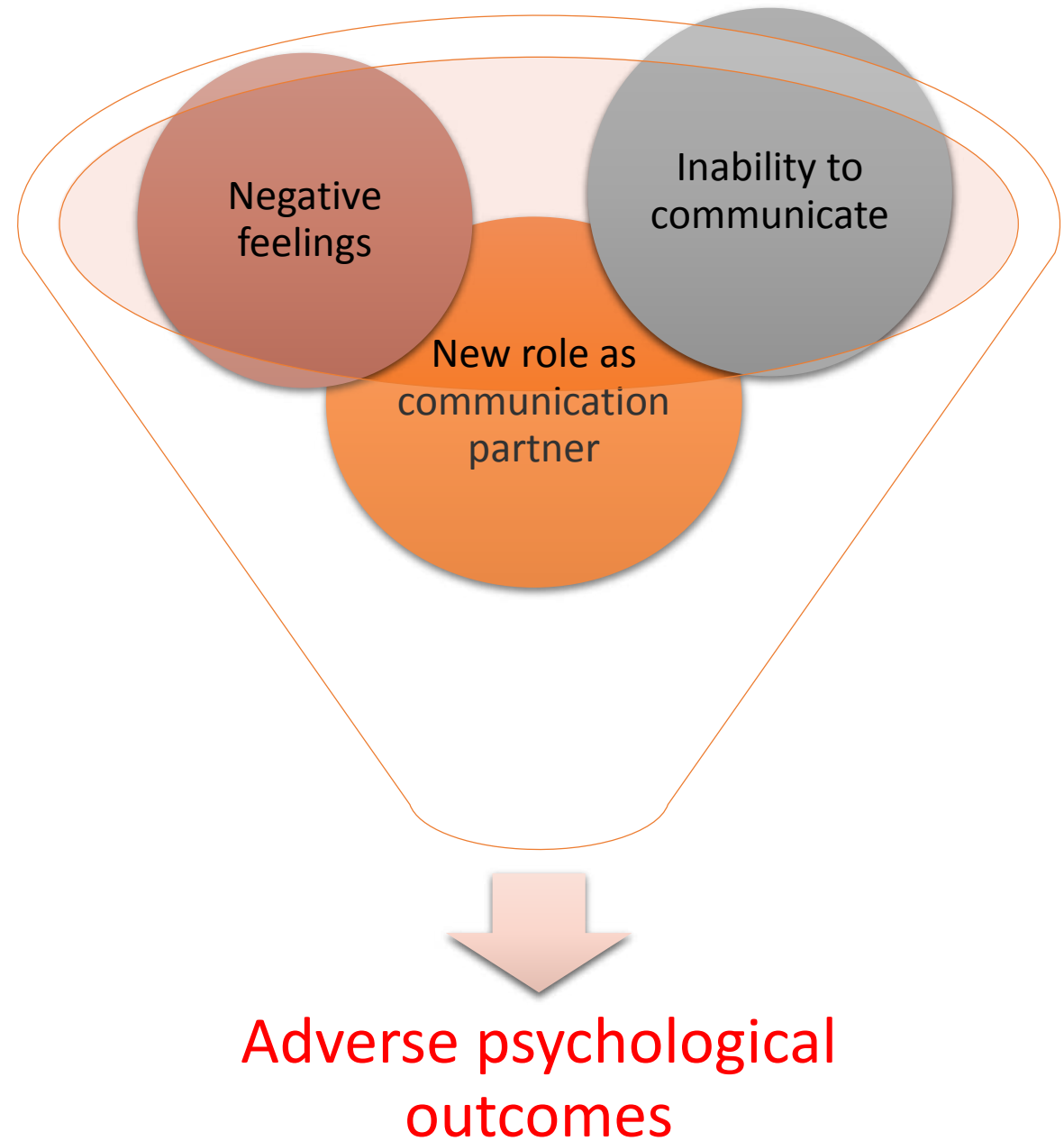
Davidson, J. W. (2010). Facilitated sensemaking: a strategy and new middle-range theory to support families of intensive care unit patients. *Critical care nurse*.;30(6):28-39.

# Sensemaking Intervention



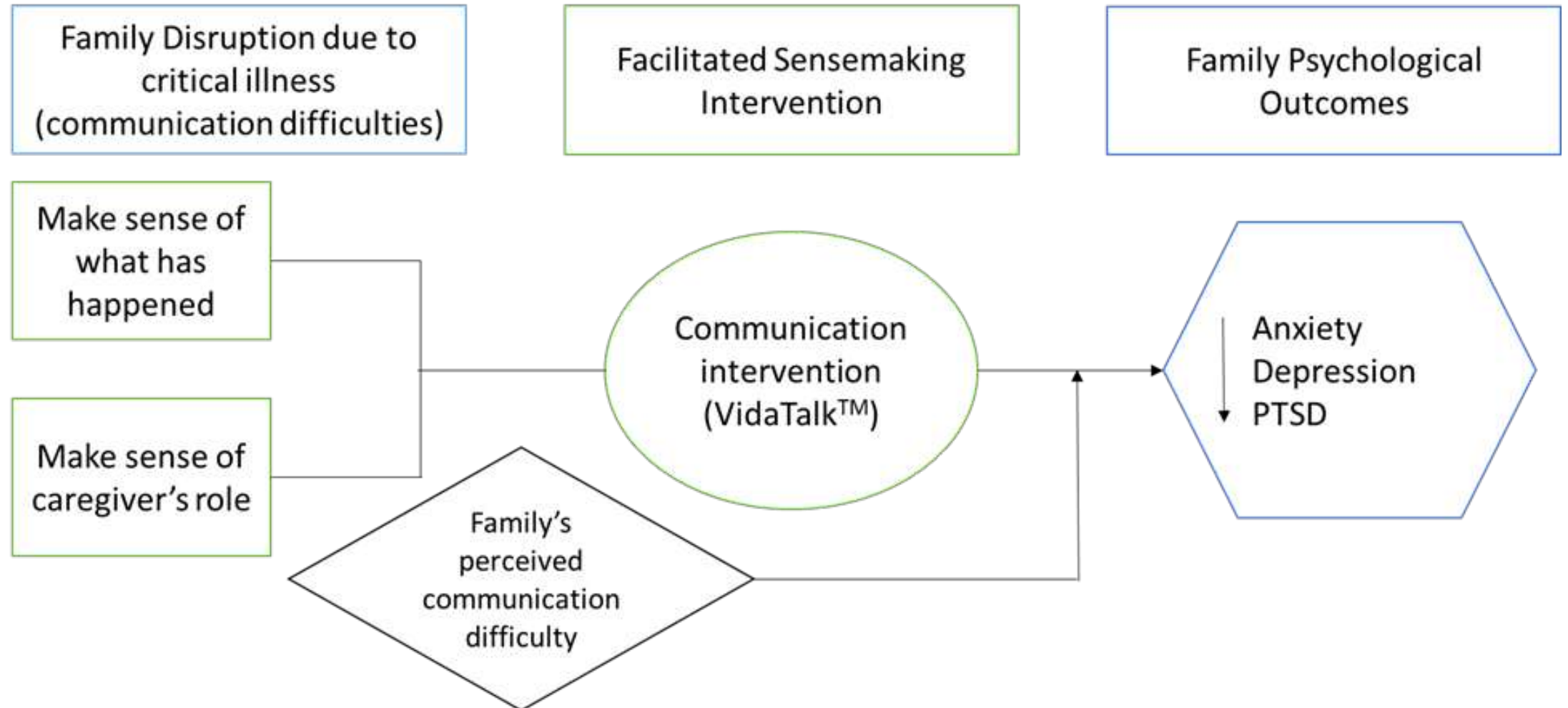
## Communication Difficulty

Lack of  
research





# Application of the FSM



More effective communication may:

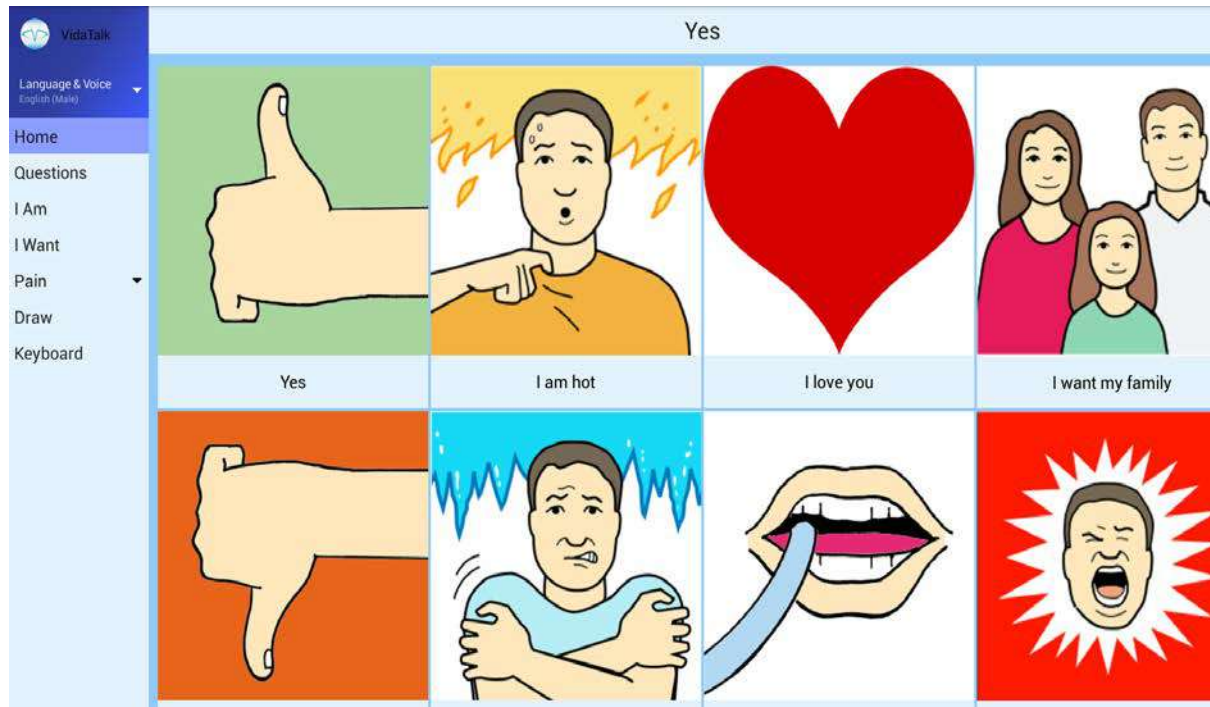
### Goal 1. make sense of what has happened

- Help them meet their own needs for communication
- Understand the patient's situation

### Goal 2. make sense of new roles

- Facilitate bedside activities by understanding patient's needs/requests
- Bring normalcy into the room by talking about daily events

# What is VidaTalk™?



# Research Purpose

**Purpose:** to test the effect of the VidaTalk™ communication application on adverse psychological outcomes in ICU family caregivers.

## Aim 1.

- Test the feasibility, acceptability, and preliminary efficacy of VidaTalk™ compared to attention control on anxiety and depression symptoms in family caregivers during the ICU stay and post-discharge (1-mos; 3-mos; 6-mos) and PTSD-related symptoms post-discharge.

## Aim 2.

- Examine the role of the family caregiver's perceived communication difficulty in moderating the effects of VidaTalk™ on the caregiver's psychological symptoms.

## Aim 3.

- Explore the family caregiver's perceptions of communication with VidaTalk™ and their emotional experience in communicating with a MV patient family member during critical illness and MV treatment.

# Theoretical Concepts and Measurement

Concepts	Variables	Measurement
<b>Disruption</b>	Communication Difficulty	<ul style="list-style-type: none"><li>• Family Communication Survey (FCS)</li></ul>
<b>Compensation</b> (Facilitated Sensemaking)	Communication Intervention (VidaTalk™ tablet communication application)	<ul style="list-style-type: none"><li>• Family Visitation Log</li><li>• Qual. Interview</li></ul>
<b>Adaptation</b>	Adverse psychological outcomes	<ul style="list-style-type: none"><li>• Hospital Anxiety and Depression Scale (HADS) : Baseline - extubation - 1 mo. - 3 mo. - 6 mo.</li><li>• Impact of Event Scale – revised (IES-R) : 1 mo. – 3 mo. – 6 mo.</li></ul>



# Thank you!

- Parent study, Phase II STTR Study, funded by National Institute of Nursing Research (NINR), Dr. Mary Beth Happ is the PI on this study
- Proposed Dissertation Study is funded by STTI Epsilon Chapter Dissertation Grant

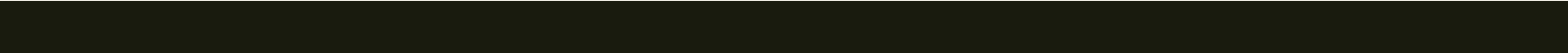


# ANIMAL ASSISTED THERAPY IN CRITICAL CARE



Dr Emma Jackson and Dr Jason Cupitt

@random1607

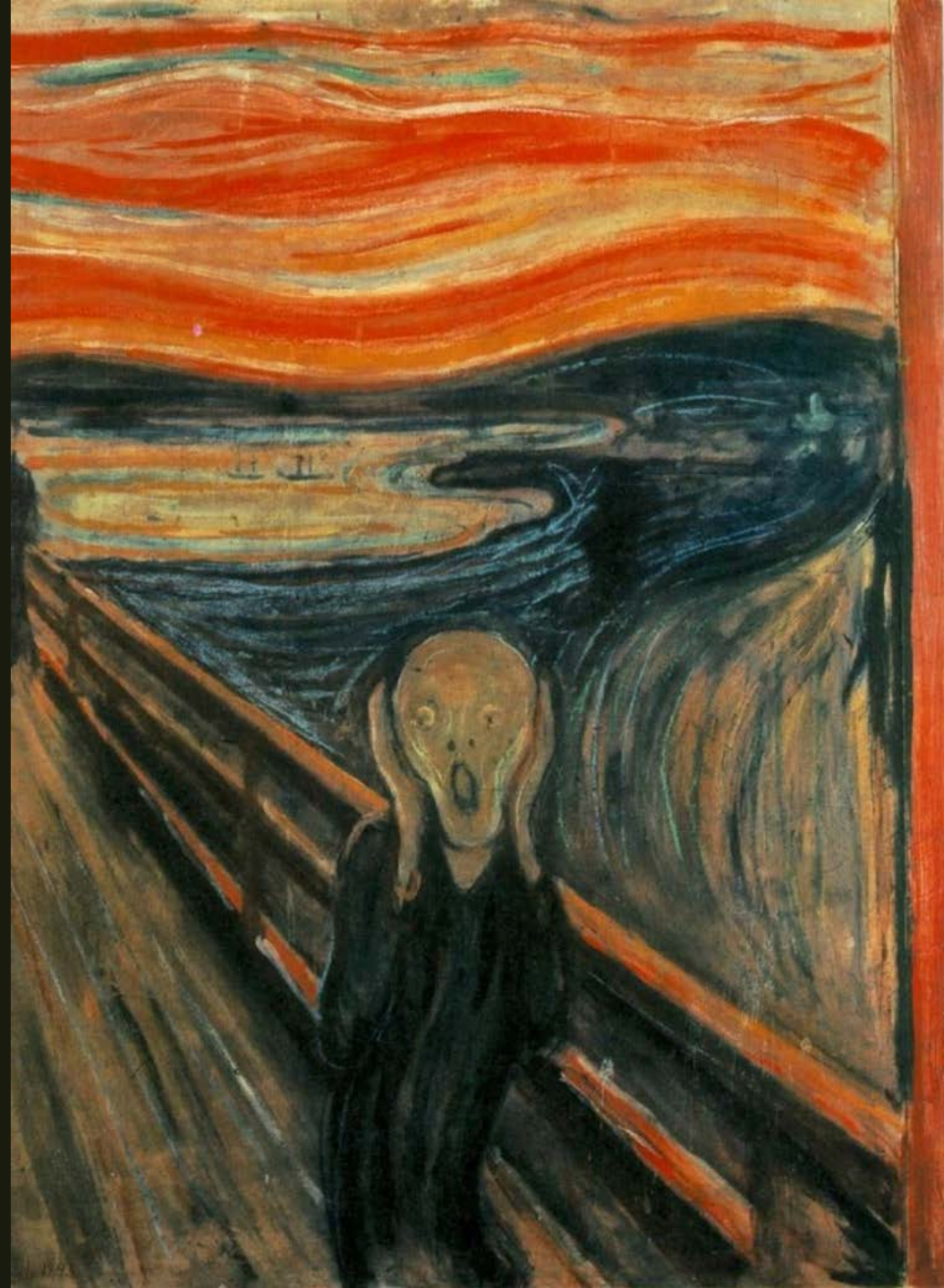


# With thanks to...

- ANWICU – who have provided my flights and accommodation @ANWICU
  - Dr Jason Cupitt @jasonmcupitt
  - Blackpool Victoria Hospital, England
  - Dandy @1Dandydog
  - KL Pony therapy [www.klponytherapy.co.uk](http://www.klponytherapy.co.uk)
- 
- All pictures displayed with permission from patients and staff



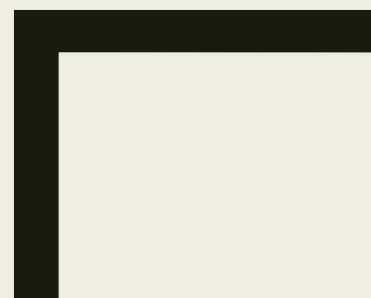
“ANY ACT BY WHICH  
SEVERE PAIN OR  
SUFFERING, WHETHER  
PHYSICAL OR MENTAL, IS  
INTENTIONALLY  
INFLICTED ON A PERSON”





# ANIMAL ASSISTED THERAPY





WHAT I DID...



# Pilot study

- 4 visits from a therapy pet
- 15 minute visit to level 2 patients
- Observations before, during, after
- Questions on psychological state
- Follow up 4/52 later

# Follow up- questions

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100% - beneficial in their recovery

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78% - normalised the critical care unit

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89% - re-orientation with the world

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100% - wanted regular visits





# ANIMAL ASSISTED THERAPY

# Was the visit beneficial to

'Completely changed the atmosphere of the unit'

'Yes – tells you the world still exists as you become insular'

'Ruddy good dog, very enjoyable visit'

'Cheered me up and helped relieve the boredom of the day'

**'Very much so, gave me a lot of peace, was calming, felt like I was in a different world'**





# How did the visit make you feel?

'Over the moon'

'Took the emphasis of my illness for a short time'

'Put a smile on your face'

'Showed my life was still ongoing outside the hospital'

'It made me feel good for the first time in a long time'









# Where to next...

- Not a cure for all
- Adjunct rather than a replacement
- Use for rehabilitation
  - *Grooming for hand therapy*
  - *Walking for physio*
- Increased number of sessions
- Formation of national guidelines



THANKYOU FOR  
YOUR TIME

Any Questions?



# Sustainability of an Early Mobilization Program in a PICU: A Qualitative Analysis of PICU Up!

Presented By: Ruchit V. Patel | November 2<sup>nd</sup>, 2018

**Ruchit V. Patel**; Archana Nelliott, BS; Juliana Redivo, MD; Michelle N. Eakin, PhD; Beth Wieczorek, DNP; Dale M. Needham, MD, PhD; Sapna R. Kudchadkar, MD, PhD



# Background

Traditional  
PICU care



Immobilize  
and Sedate



Long Term  
Implications



## Step 1-Screening Process: Early Activity and Mobility Levels

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



PICU Up!™

### LEVEL 1: Parameters for Inclusion

- Intubated with  $\text{FiO}_2 > 60\%$  *or*
- Intubated with  $\text{PEEP} > 8$  *or*
- Intubated difficult airway *or*
- New tracheostomy *or*
- Acute neurological event *or*
- Sedated and SBS -3 to -2 *or*
- Vasopressor other than Milrinone

### LEVEL 2: Parameters for Inclusion

- Intubated or tracheostomy with  $\text{FiO}_2 \leq 60\%$  *+or*  $\text{PEEP} \leq 8$  *and* SBS -1 to +3 *or*
- Noninvasive respiratory support with  $\text{FiO}_2 > 60\%$  *or*
- Dialysis/Renal Replacement Therapy *or*
- Femoral access

### LEVEL 3: Parameters for Inclusion

- Non-invasive respiratory support with  $\text{FiO}_2 \leq 60\%$  *or*
- Baseline pulmonary support *or*
- EVD cleared by NUS *and* SBS -1 to +3

# PICU Up! Program Success

- Demonstrated it was feasible and safe with **0 adverse events**
- Expanded the definition of mobility
- How can it be sustained?

Screening is followed by a progression of activities appropriate for the patient's level.

## Activity Progression: Level 1

- Lights on/shades up by 0900
- Bed/bath/weight by 2300
- Lights dimmed/out by 2300 increase lighting as needed for cares/interventions
- TV limited to 30 min at a time. Goal of < 2 hours per day for children >2 yo
- HOB elevated  $\geq 30^\circ$
- Turn q2h daytime and q4h at night
- Positioned in developmentally supportive position or as recommended by OT/PT
- OT consult by PICU day 3
- PT consult as needed

## Activity Progression: Level 2

- Level 1 activities *plus*
- Positive touch for infants/toddlers
- Sitting up in bed TID
- Team to consider OOB to chair +/- ambulation
- OT/PT consult by PICU day 3
- Assess for difficulty with communication or phonation and consult SLP
- Assess for swallowing readiness in high risk children and consult SLP
- Assess need for daily schedule
- pCAM-ICU BID

## Activity Progression: Level 3

- Level 1 and 2 activities *plus*
- OOB to chair TID or sitting up in bed TID if appropriate chair is not available
- Ambulate BID if trunk control present

# Objectives

1. Characterize multidisciplinary staff perspectives of the PICU Up! program.
2. Determine barriers, facilitators, and cultural changes contributing to sustainability of PICU early mobility.
3. How early mobility fits with other ABCDEF bundle components.
4. Develop strategies for implementation and improvement of structured early mobility initiatives.



# Methods

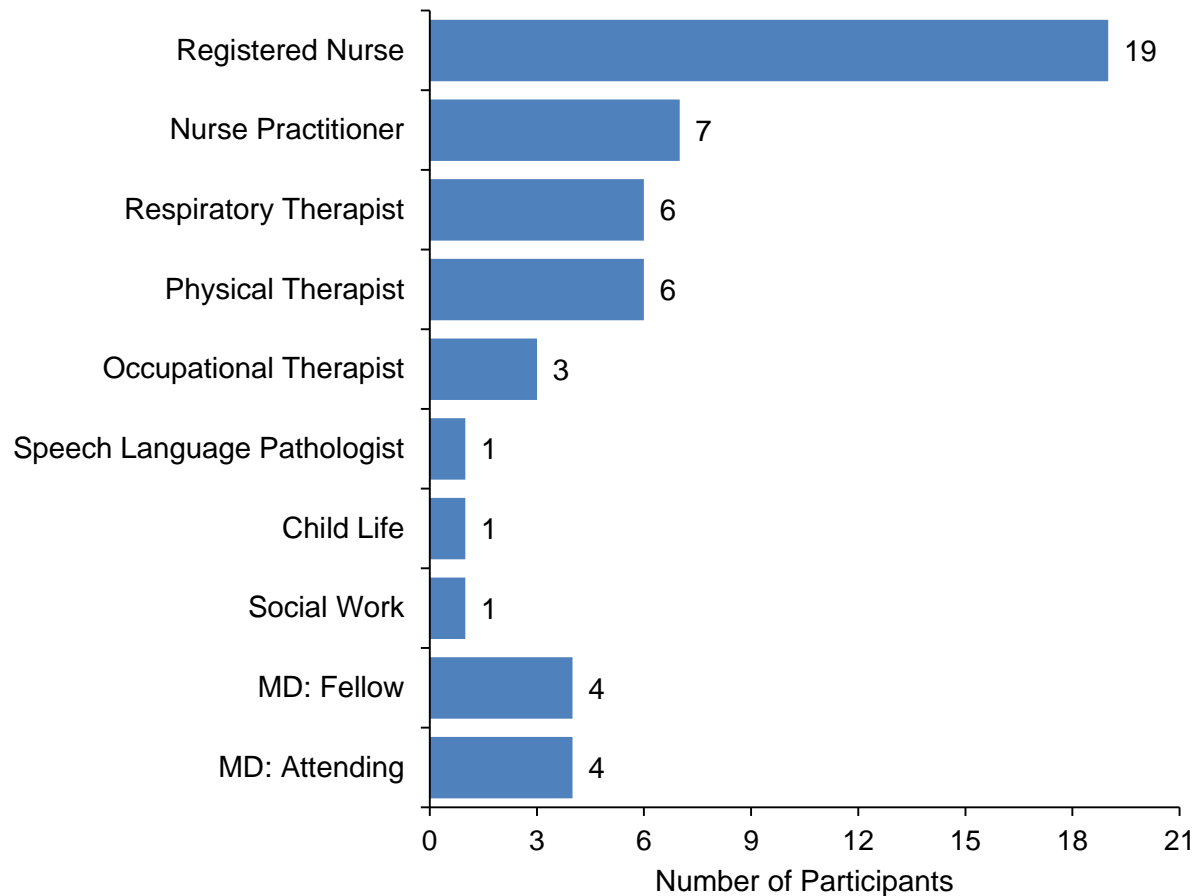
- Qualitative study: semi-structured interviews based on CFIR
- Purposive sampling (N=52) of all JHH PICU staff
- Interviews recorded and transcribed – analyzed using Dedoose online coding software

## Consolidated Framework for Implementation Research (CFIR)

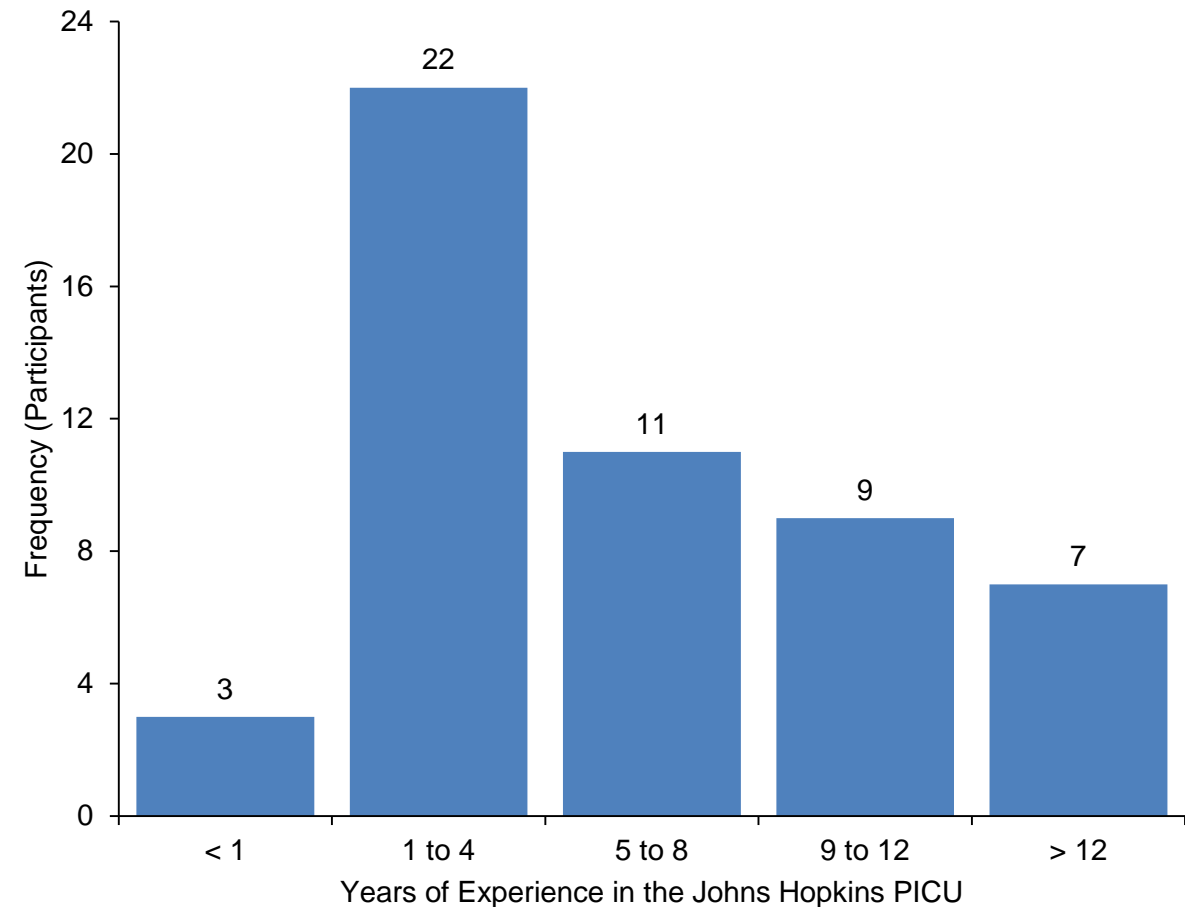


# Demographics

## Staff Participant Breakdown by Discipline



## Staff Participant Experience in the JHH PICU

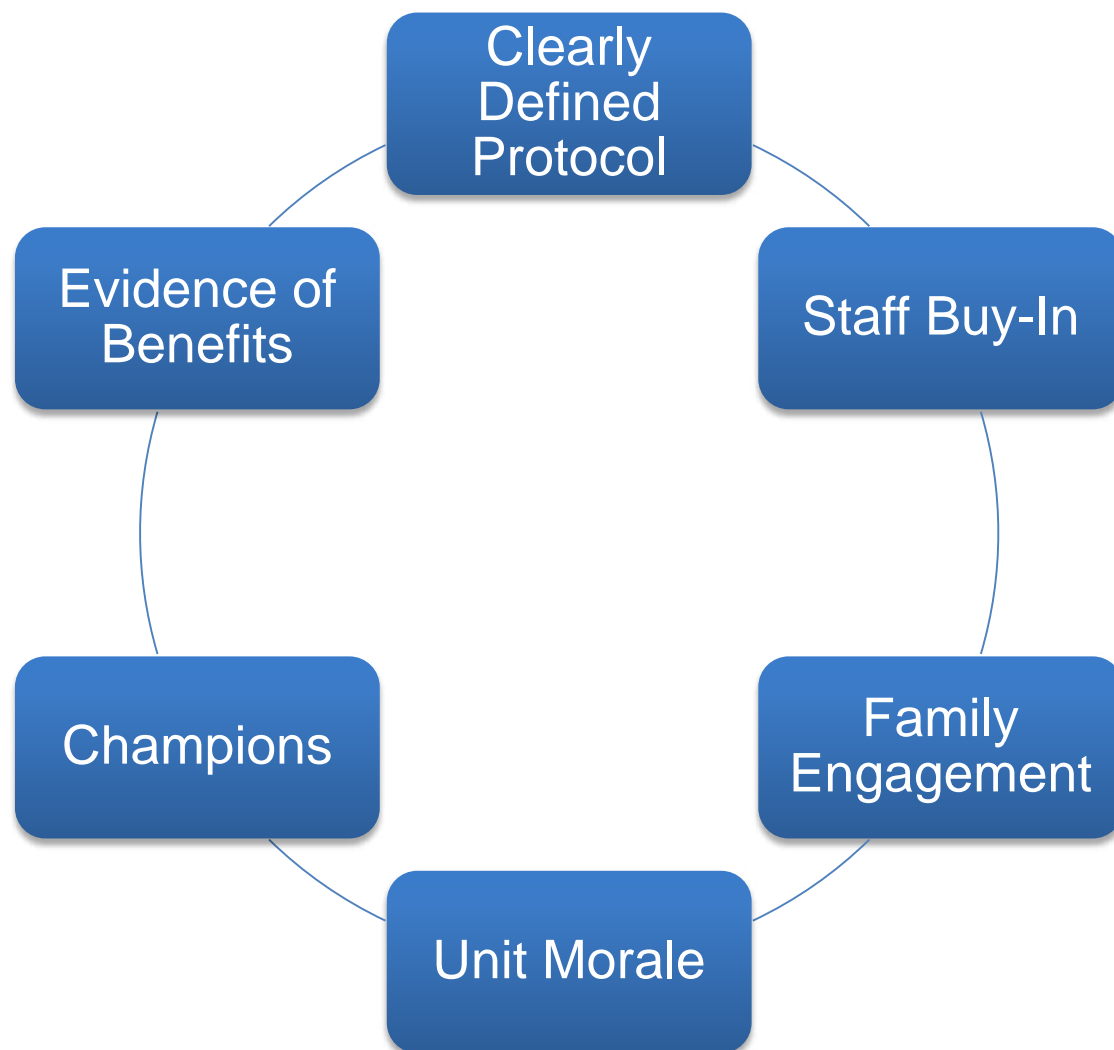


# Thematic Analysis



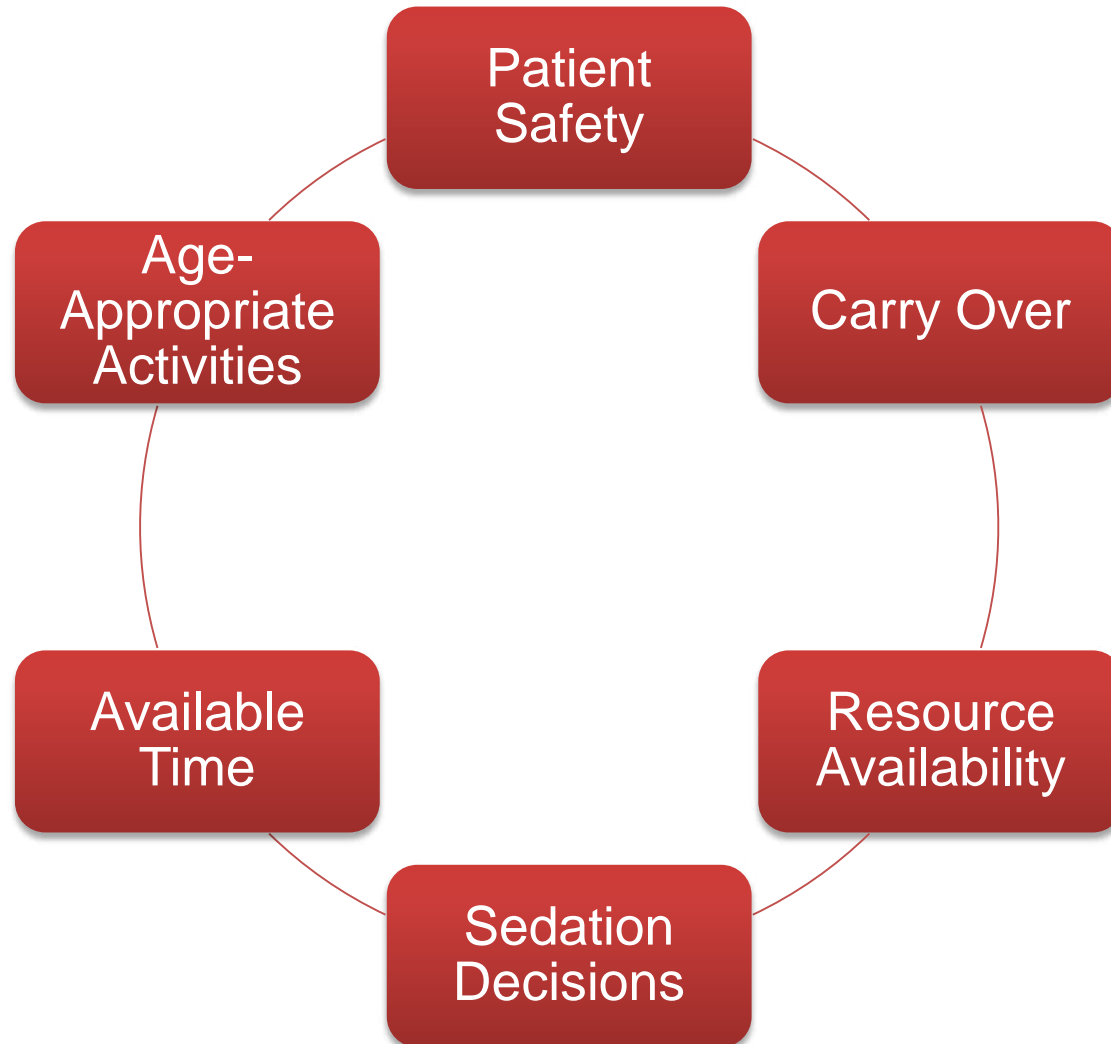
# RESULTS

# Facilitators



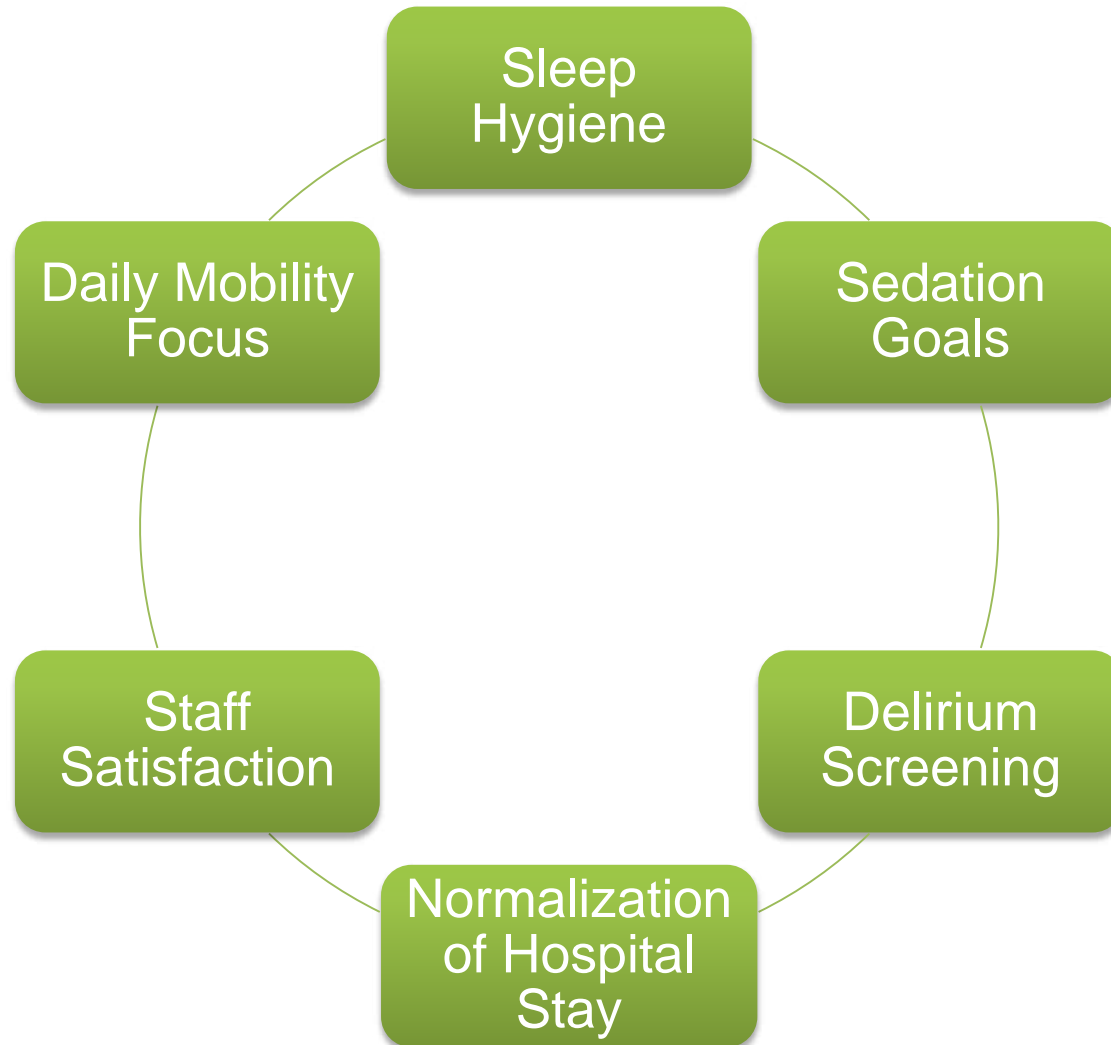
*“I think it’s so important to engage families. The parent knows the patient the best and just having that familiar voice...to comfort the kid in the way that they know works.” – RN*

# Barriers



*“One of the biggest challenges is carry over. There’s definitely inconsistency...when I recommend equipment or seating devices or activities.” – OT*

# Cultural Changes



*“Early mobility is essential. You can see the difference in someone who is just laying in their bed with artificial lighting, lines, and tubes.” – PT*

# Implementation Strategies



*“Change is hard and you really need a multidisciplinary group who can dedicate their time to making something happen.” – MD: Fellow*



# Addressing Barriers

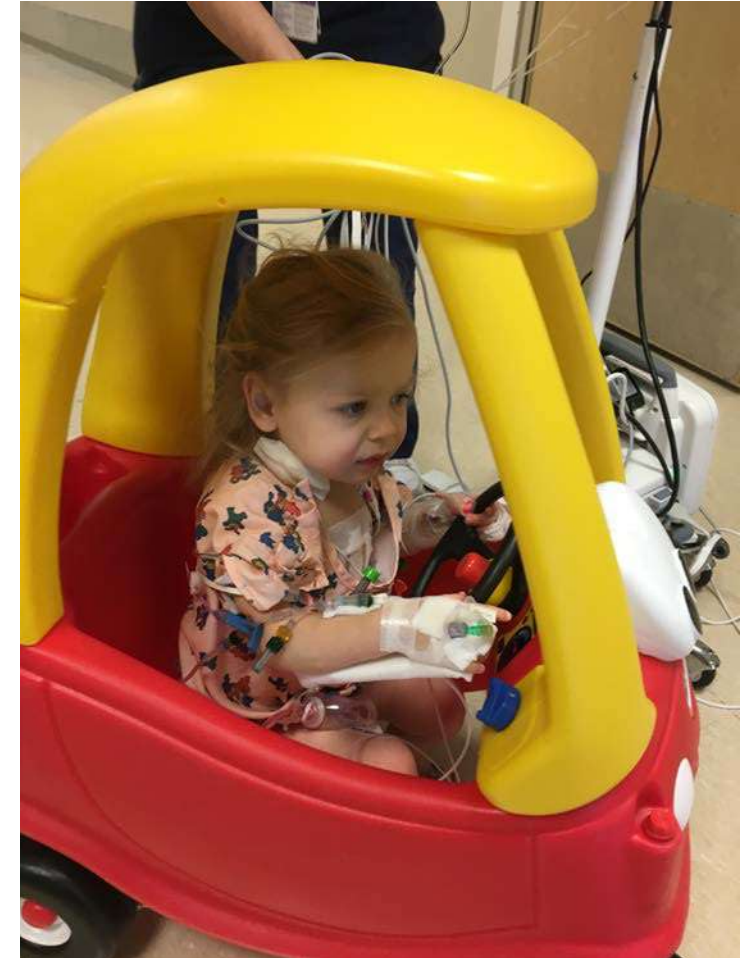
- **Carry Over**
  - Mentioning mobility goals in nursing notes early in the day
  - Pictures/videos of equipment and setup
- **Sedation Decisions**
  - Establishing a common language (e.g. JHH PICU – SBS)
  - If possible, a protocol for sedation and mobility
- **Available Time**
  - Broaden range of staff involved (SLP, Child Life, Social Work all integral to early mobility)

# Addressing Barriers cont.

- **Night Shift**
  - Emphasizing components related to mobility: sleep, delirium prevention
  - Communication and continuity between day and night shifts
- **Resource Management**
  - Running ledger, tracking system to keep staff updated on what is available
  - Storage and ease of accessibility

# Conclusion

- PICU staff are supportive and invested in early mobility
  - Positively influencing unit culture
- Resource constraints and interdisciplinary differences impacting consistent execution
  - Integrating other PICU staff roles to support nursing
- Interdependency with other ABCDEF bundle components



# Next Steps

- Patient and family perspective on mobility: what's working and where we can improve
- Use staff feedback to drive growth in PICU Up!



# Acknowledgements

- Johns Hopkins PICU staff
- Sapna Kudchadkar, MD, PhD
- Archana Nelliot, BS
- Juliana Redivo, MD
- Beth Wieczorek, DNP and the PICU Up! Committee
- Michelle Eakin, PhD
- Dale Needham, FCPA, MD, PhD
- Support from the Provost's Undergraduate Research Award

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# QUESTIONS?



@PICU\_Up, @RuchitVP



# **WeeMove:**

## **Development and Implementation of a Pediatric Inpatient Early Mobilization Protocol in the Cardiac ICU**



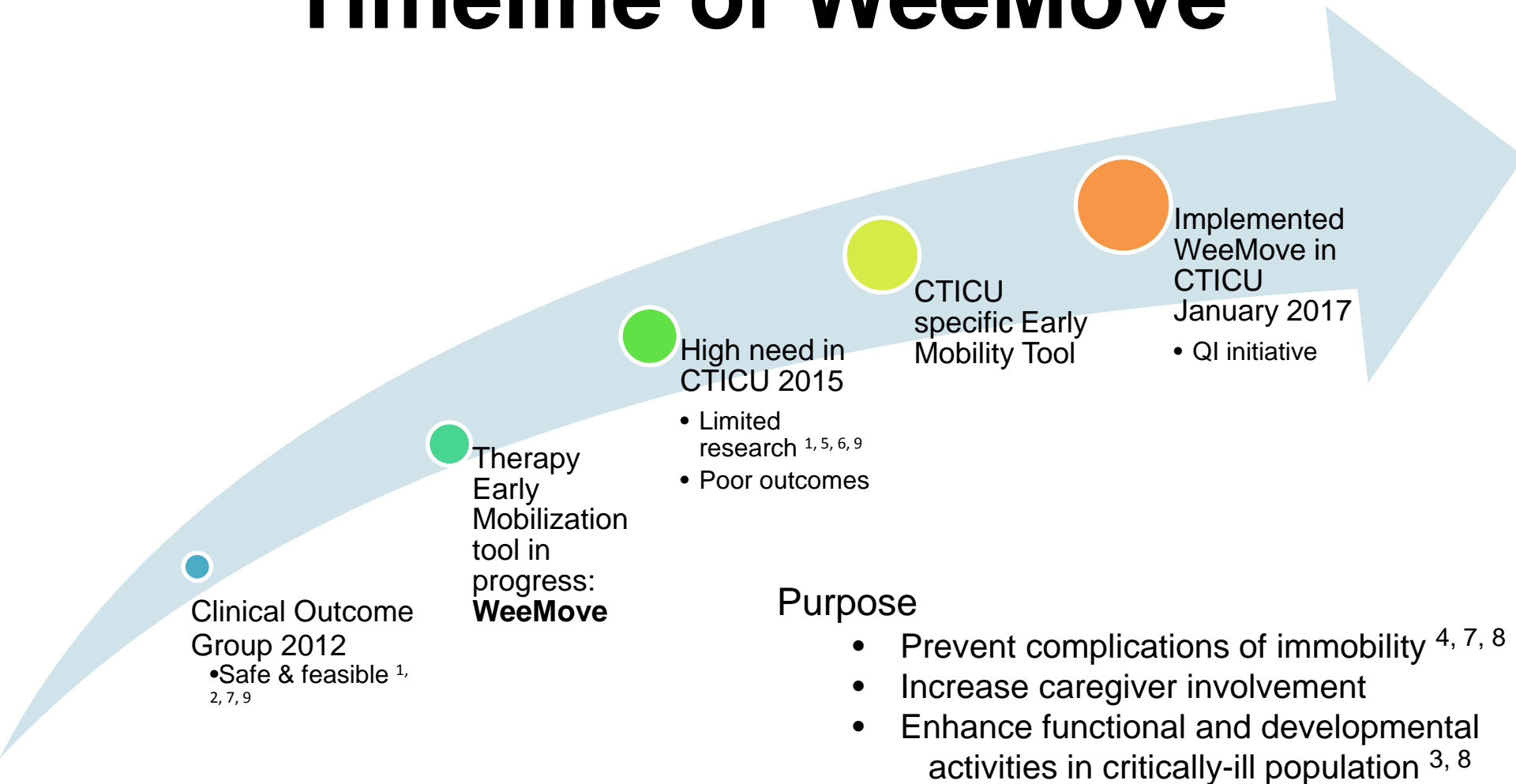
Sarah Eilerman, PT, DPT Erin Gates PT, DPT  
and Kathryn Malone, PT, DPT



# Objectives

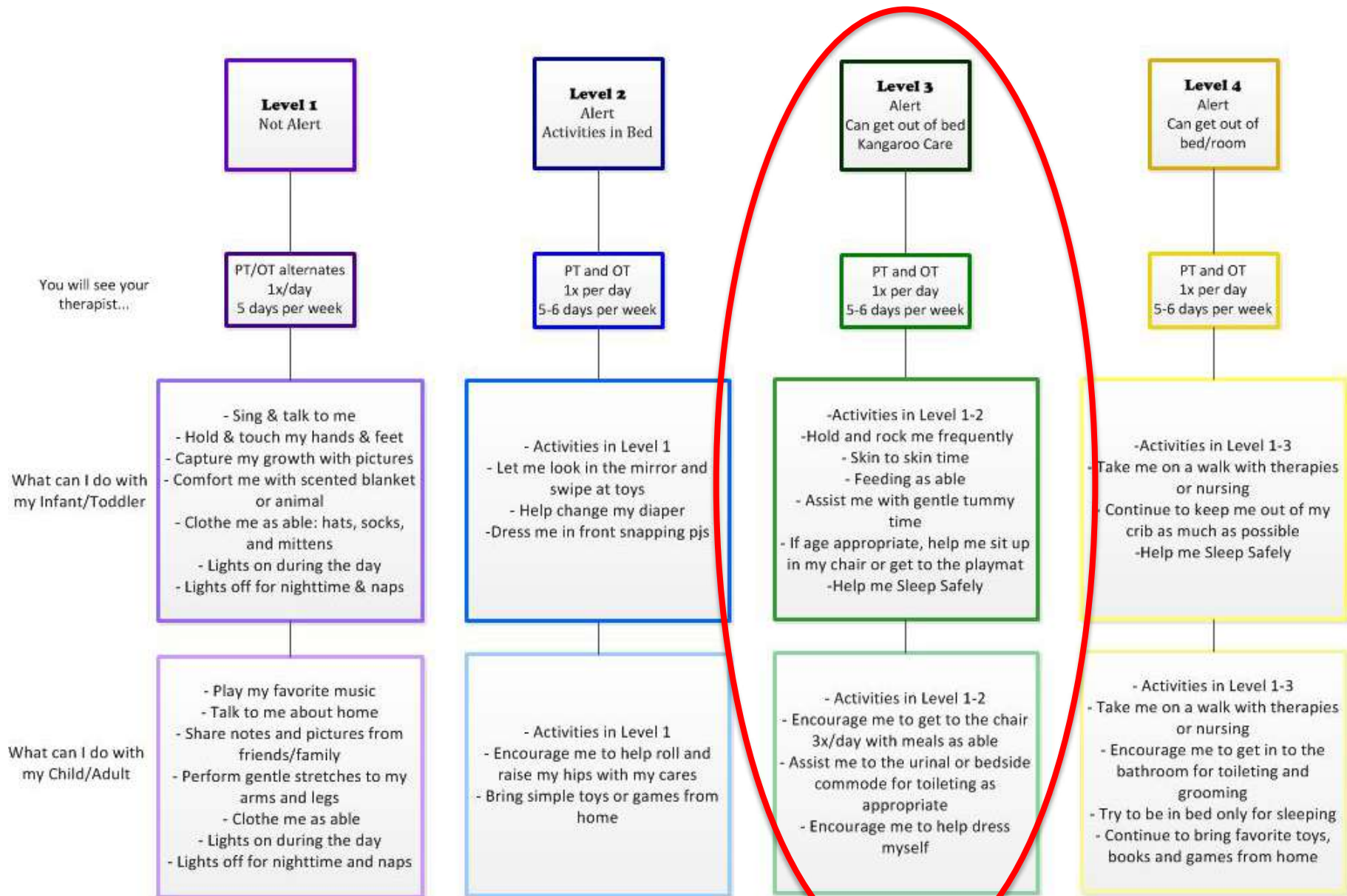
- State reasoning and process for developing cardiac-specific early mobilization protocol
- Discuss methods for active caregiver engagement
- Review outcomes of early mobilization initiative

# Timeline of WeeMove



# WeeMove Design

- 4 Activity Levels
  - Determined by medical team BID
    - Based on medical status
    - Hard stops: pH < 7.2, lactate > 5
  - Frequency:
    - PT/OT 1-2x/day, 5 days/week
    - Dependent on activity level



**NATIONWIDE CHILDREN'S**  
*When your child needs a hospital, everything matters.™*

# Level 3: Infant/Toddler



- Hold/Rock Me
- Kangaroo Care
- Tummy time
- Age appropriate activity on play mat

# Level 3: Child/Adult



Up to chair 3x/day

Walking in  
room/to  
restroom as able

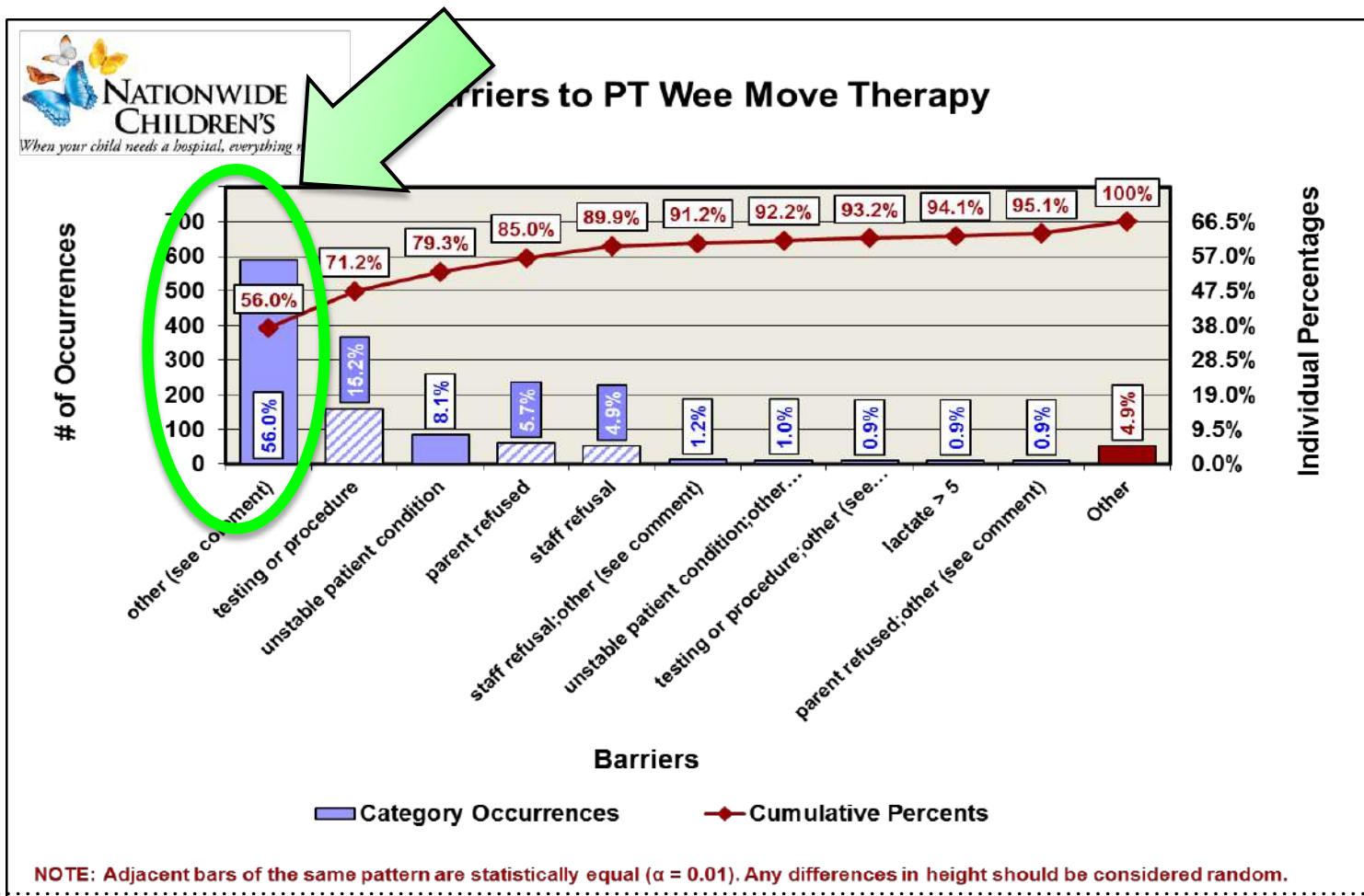
Encourage me to  
get dressed

# Current Descriptive Results

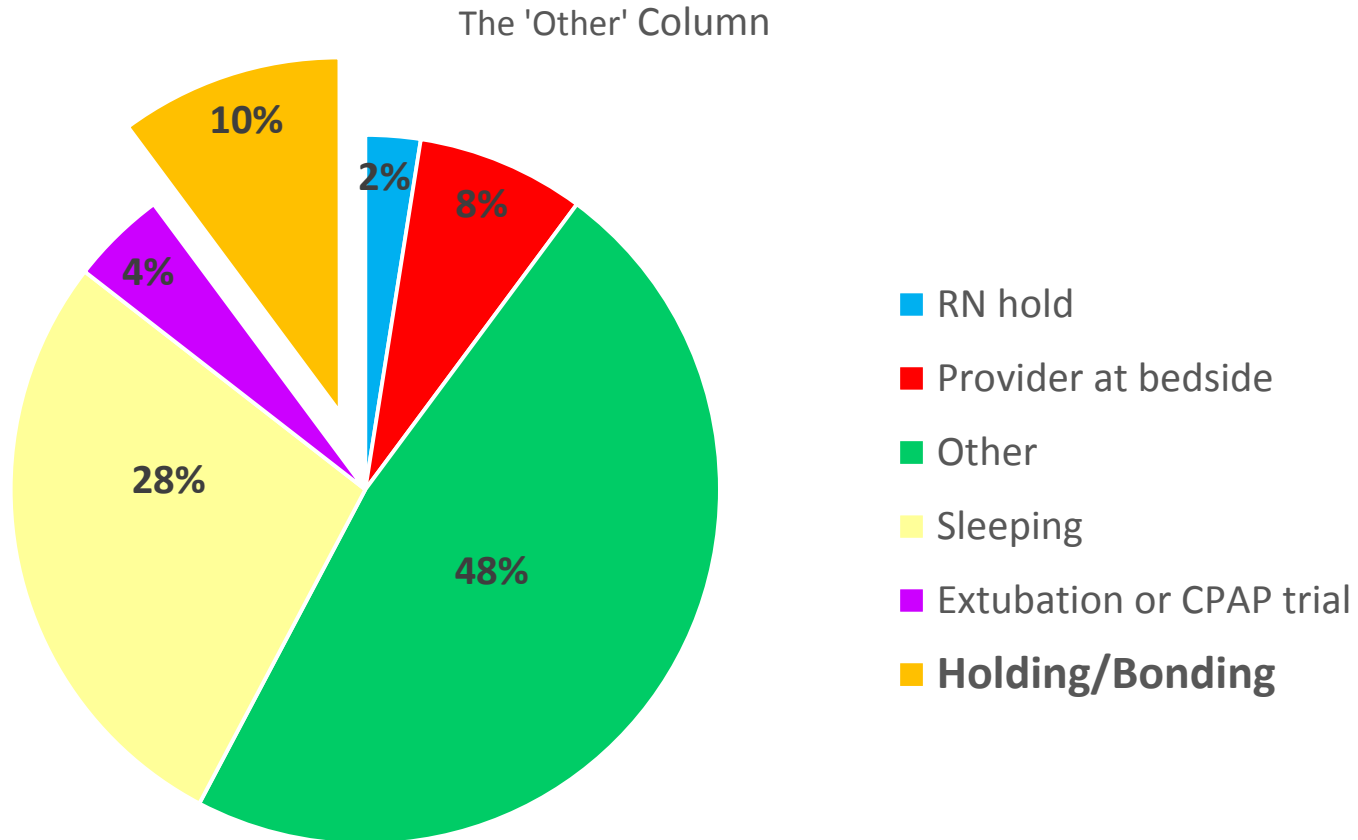
	2015 Pre-WeeMove	2016 Pre-WeeMove	2017 Post- WeeMove	2018 Post- WeeMove
Length of Stay	Average 6.1 days	Average 6.4 days	Average 5.4 days	Average 5.61 days
Time Intubated	Only one adverse event has occurred: NJ removal			Average 30.65 hours
New DVTs	5*	16	11	2
New Infections	56	64	51	10
# of Encounters	702	660	701	327



# Current QI Results



# Is holding a barrier?



# Subjective Results



# Conclusion

- Promoting caregiver bonding
- Trending toward improved resource utilization outcomes
- Work in progress
  - Evaluate limitations
  - Assessment tools
  - Increasing frequency of therapy intervention

# Acknowledgements

- Amy Young, PT, DPT, Tiffany Webb, PTA,
- Inpatient Physical and Occupational Therapy Departments
- Eric Lloyd, MD: Physician Champion
- Kevin Dolan: Quality Improvement Service Line Coordinator
- CTICU nursing staff
- CTICU nurse practitioners

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- .....



# TOGETHER WE'RE BETTER:

---

**Multidisciplinary Targeted Therapy Rounds to  
Optimize Patient Outcomes in the Surgical  
Intensive Care Unit**

Lindsay Riggs PT, DPT and Lauren Kwiatkowski MOT, OTR/L



THE OHIO STATE  
UNIVERSITY  
WEXNER MEDICAL CENTER





## Additional Contributors

---

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Sarah Shatto MS, OTR/L

# Surgical Intensive Care at The Ohio State University Wexner Medical Center

*Include two SICUs: OSU University Hospital and OSUCCC-James*

---

- The James
  - Care for surgical patients with a cancer diagnosis
  - 12 beds
  - Therapy staff: 1 PT, 1 OT, assist from PTA and COTA as needed
  - Rounding members: PT, OT, CNS, SICU NPs, lead RT

# Surgical Intensive Care at Ohio State

*OSU University Hospital and OSUCCC-James*

---

- OSU University Hospital
  - Care for patients on the trauma, burn, transplant, ENT, orthopedic, plastics and general surgery services
  - 26 beds
  - Therapy staff: 1 full time PT, 1 full time OT
  - Rounding members: PT, OT, SICU Fellow, RT

# Multidisciplinary Targeted Therapy Rounds (MTTR)

---

- The literature supports multidisciplinary rounding in the critical care setting for subjective increased collaboration and improved communication between providers.
- However, there are limited studies examining objective patient outcomes in relation to daily rounding.

# Multidisciplinary Targeted Therapy Rounds (MTTR)

*Initiated April 2016*

---

- Purpose: To improve communication between providers and ensure appropriate OT/PT consults.
  - Improve efficiency for therapists
  - Increase patient mobility, participation with ADLs & functional activity
  - Up to date activity orders

# Multidisciplinary Targeted Therapy Rounds (MTTR)

*Respiratory Therapy joined MTTR in September 2017*

---

## Goals

- Decrease patient ventilator time
- Decrease time between spontaneous breathing trial and extubation
- Added bonus: Optimize patient mobility with increased communication between RT and PT/OT

# Patient Mobility

---

- Pre-MTTR data obtained from October 1<sup>st</sup>, 2015 – March 31<sup>st</sup>, 2016
- Post-MTTR data obtained from February 1<sup>st</sup>, 2018 – July 31<sup>st</sup>, 2018
- Data collected on all SICU patients with some attempt of mobility documented by either therapy or nursing staff

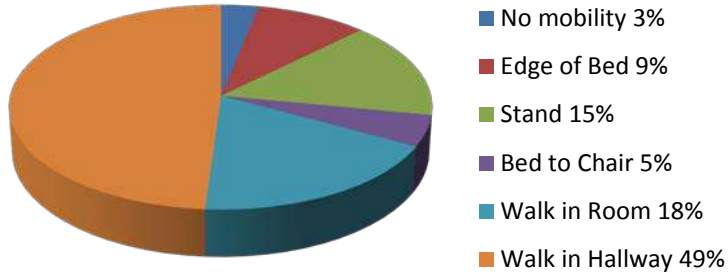


# Patient Mobility

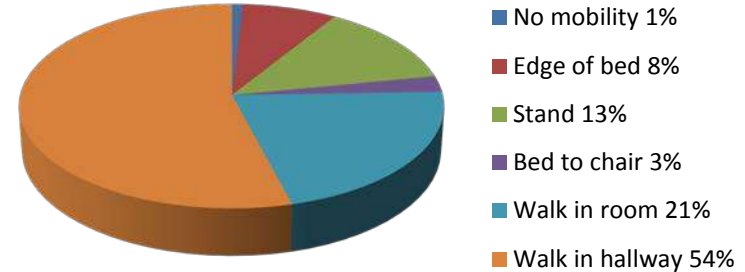
*Indicates highest level of mobility achieved while in the SICU*

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Pre-MTTR Mobility

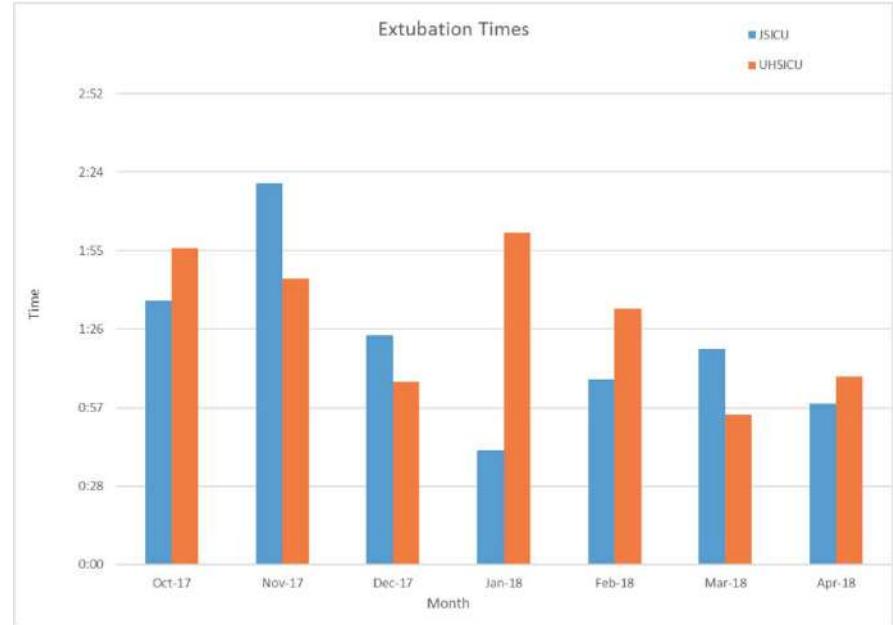


Post-MTTR Mobility



# Decreasing Time on Ventilator

- The data collected indicates a decrease in time from spontaneous breathing trial (SBT) to extubation by an average of 35 minutes.
- SICU team goal: SBT to extubation in 1 hour or less



# Perception of Therapy Rounds

*Qualtrics survey sent in July 2018*

---

- Survey evaluated provider perception of MTTR
- 8 question survey
- Surveys sent to PT, OT, CNS, NP, and RT
- 20 out of a total of 57 providers responded to the survey
- Overall favorable response rate of approximately 84%
  - Responses rated agree or strongly agree
  - Individual question ranges from 60-95% positive

# Perception of Therapy Rounds

*Survey Questions included:*

---

- Daily mobility rounds has increased my awareness that patients requiring certain respiratory equipment can be mobilized
- Daily mobility rounds has increased communication between members of the multidisciplinary team
- Information from daily mobility rounds facilitates ventilator weaning and/or extubation
- Daily mobility rounds has provided me with better understanding of roles of multidisciplinary team members
- Daily mobility rounds has improved efficiency of my work day
- Daily mobility rounds promotes a culture of teamwork
- Daily mobility rounds has increased my awareness of which patients are appropriate to mobilize
- Daily mobility rounds has improved patient mobility in the SICU

# Implications for Practice

---

- The Implementation of MTTR has yielded positive benefits regarding objective patient outcomes as well as subjective interdisciplinary communication and collaboration.
- We believe that this model of intentional collaborative communication can be employed in other areas in order to improve communication and increase collaboration between multidisciplinary team members leading to improved quality of patient care.



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# Thank You



[wexnermedical.osu.edu](http://wexnermedical.osu.edu)



# Strong today, Stronger tomorrow: Creating a Culture of Early Mobility in the Medical Intensive Care Unit

Kristen Clifford, RN, BSN RN 4, FCCS  
Regan Myers, RN, BSN RN 2

## Kristen Clifford

- B.S.N Oakland University
  - Rochester, Michigan
- Registered Nurse 4, Medical ICU
  - 9 Years
- Quality Improvement Analyst (QIA)
  - 1.5 years

## Regan Myers

- B.S.N University of Michigan
  - Ann Arbor, Michigan
- Registered Nurse 2, Medical ICU
  - 4 Years

# Vanderbilt University Medical Center

- Nashville, TN
- 1,000+ Beds
- 2 million encounters per year
- Level 1 Trauma
- Medical ICU
  - 35 beds



# Purpose

- **Increase** early mobility and make it standard care in the Medical Intensive Care Unit (MICU) to improve patient outcomes through a campaign “*Strong Today, Stronger Tomorrow MICU Early Mobility.*”



# Strategy and Implementation

- Awareness increased with Early Mobility Protocol, using Johns Hopkins Highest Level of Mobility (JH-HLM) Scale
- Nurses presented patient's mobility (ABCDEF Bundle) during morning rounds with ICU team to facilitate orders.
- Education created for all bedside nurses, care partners, respiratory, physical and occupational therapy. Including informal in-services, mobility workshops, and unit board.



# Strategy and Implementation

- To ensure patients were being mobilize, an early mobility tracker (JH-HLM scale) was used to monitor daily mobility. (3 month time period)
- Scale was completed and documented during every shift.
- Educational handouts for families regarding passive ROM
- **Evaluation metrics include:**
  - 1) Staff perceptions of early mobility
  - 2) Quality metrics of unit acquired pressure ulcers and falls.
- The campaign was launched in Nov 2016.

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

↑  
MOBILITY LEVEL  
↓

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

\*Bed activity includes passive or active range of motion, movement of arms or legs, and bed exercises (e.g., cycle ergometry, neuromuscular electrical stimulation).

**Score 2:** All activity for score 1, Active ROM, Sit and be fit

**Score 3:** All activity for scores 1 & 2

**Score 1:** Passive ROM, Neuro Chair, Shuttle Chair, Bed in chair position, tilt table, total lift

**Score 4:** All activity for scores 1-3, Sit to stand, steady

**Score 5:** All activity for scores 1-4, walker

**Score 6:** All activity for scores 1-5, bird-cage walker

**Score 7:** All activity for scores 1-6, bird-cage walker

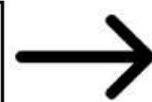
**Score 8:** All activity for scores 1-7, bird-cage walker

BED

CHAIR

STAND

WALK



# Early Mobility Tracker

- Documentation barrier prior to implementation
- Tracking sheet is to be filled out daily by day and night shift, just one simple line
- Multidisciplinary – Filled out by Nursing and PT/OT
- Data Collection



## Incentives for Staff

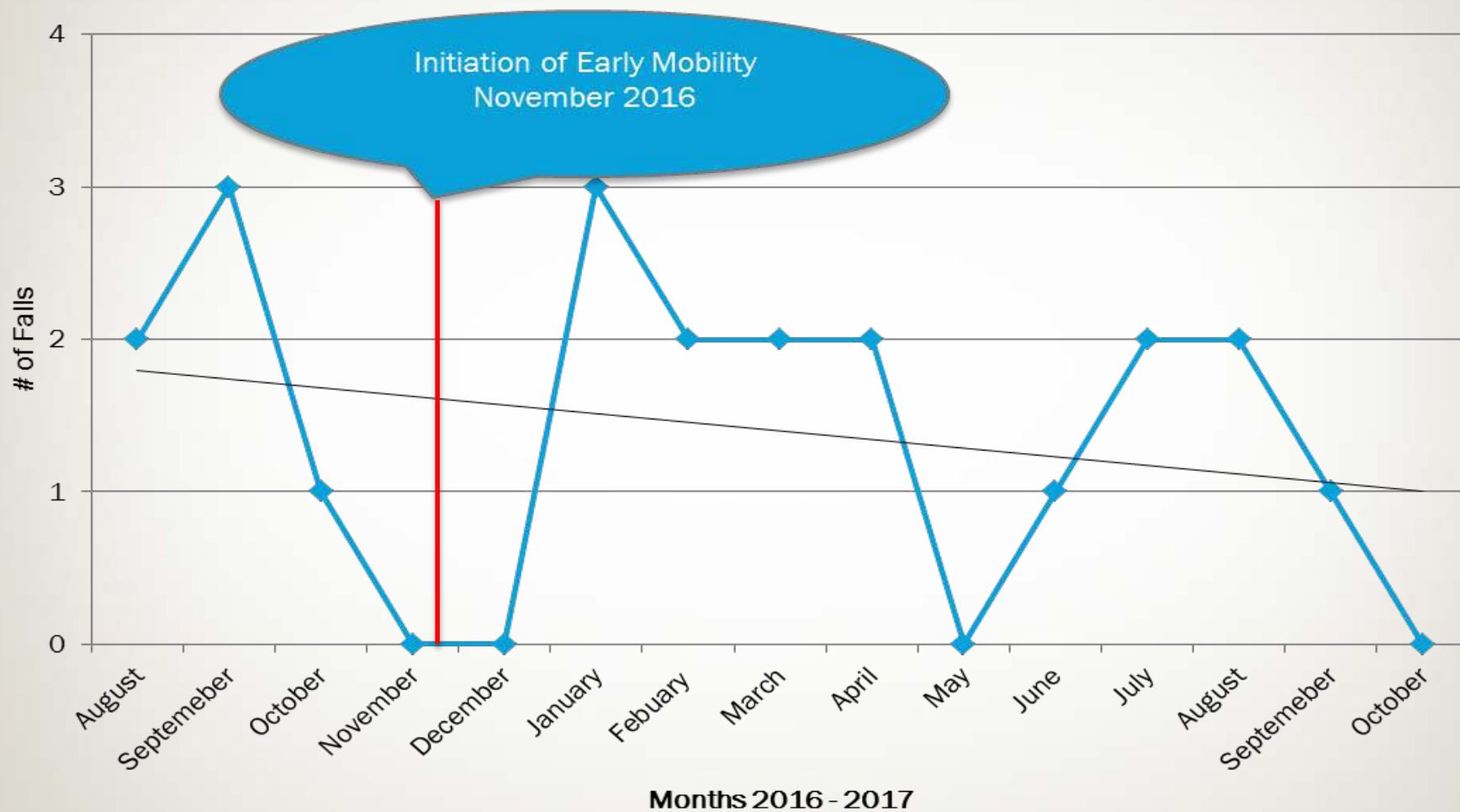
- Launch party for day and nightshift
- MICU Mobility Swag
- Monthly Mobility Champion for 1 year – Gift Card



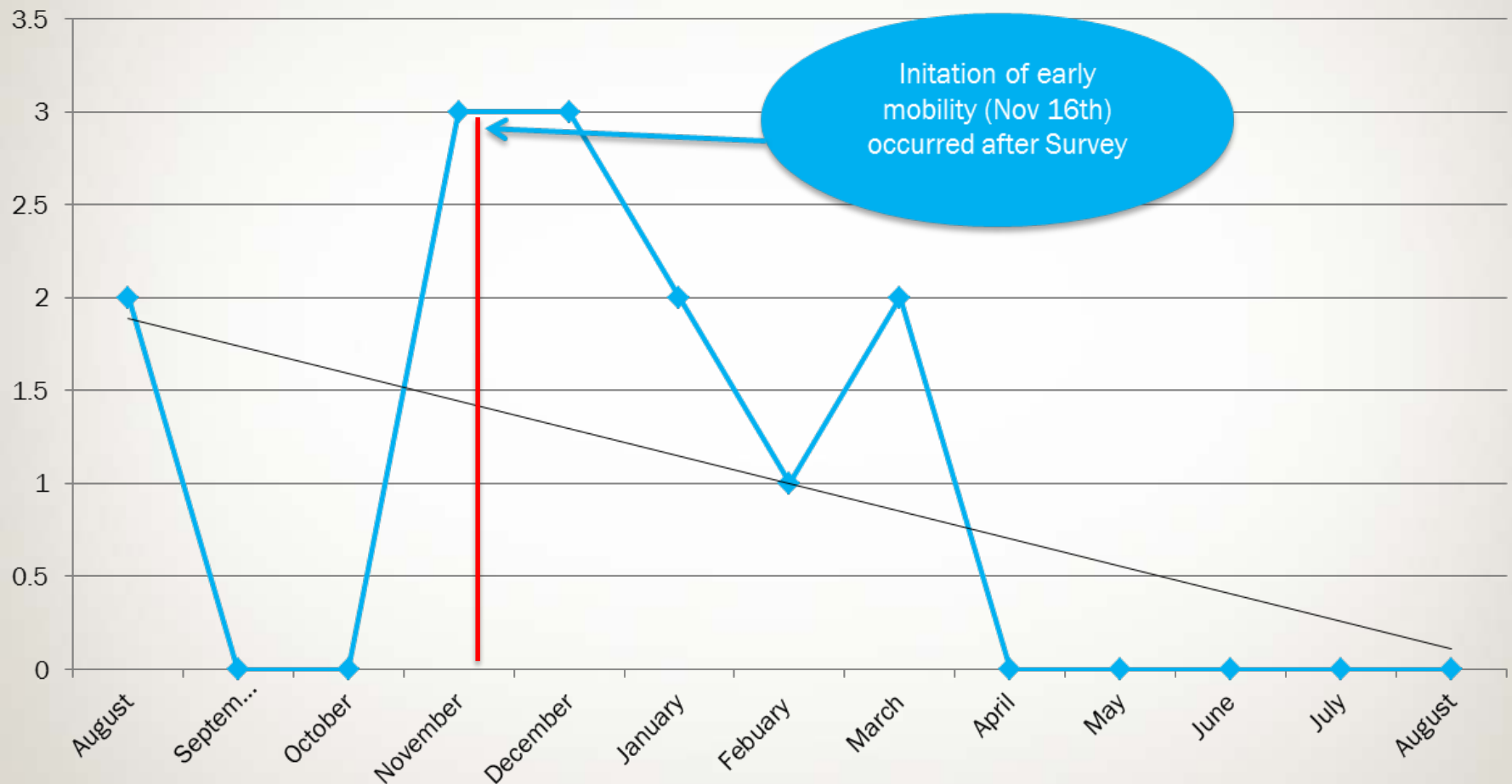
# Results

- Daily mobilization of 66% (349/550)
- There was an improvement in staff belief in ability to safely mobilize patients ( $X^2$ ,  $p < .001$ )
- Patients mobilized once a shift more often ( $X^2$ ,  $P = .068$ ).
- Monthly fall and pressure ulcer rates declined post implementation.
- 1 year post implementation - Average patients mobilized once a shift - 88%
- 2 year post implementation – 60%

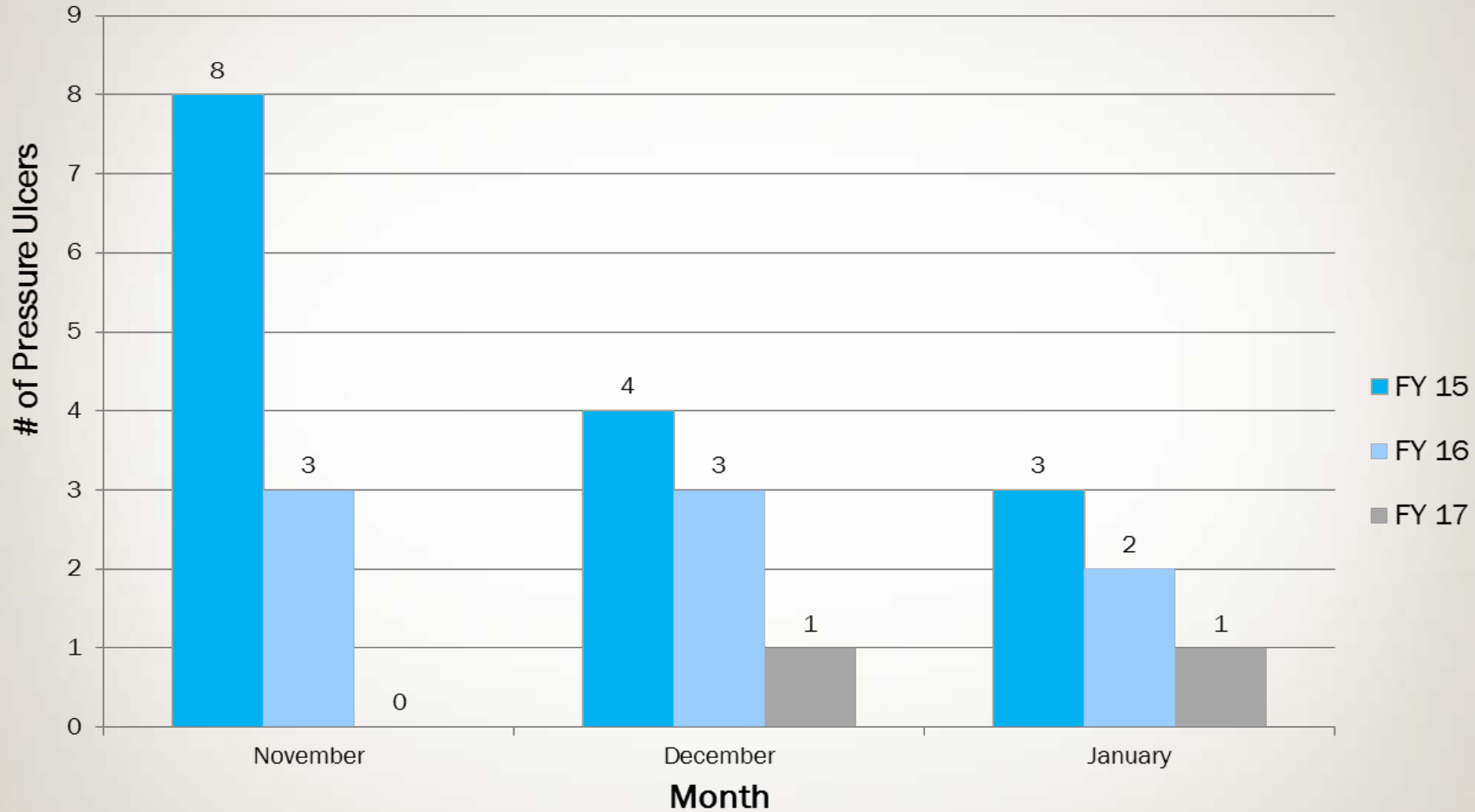
## # of MICU Falls Pre and Post Initiation of Early Mobility



## # of MICU Patients with HAPU Pre and Post Initiation of Early Mobility



## # of MICU HAPU FY 15 - FY 17





# Implications For Practice

- Use of multiple strategies (education, monitoring, reminders, incentives, and feedback) successfully hardwired ICU mobility as standard care and increased nurse ownership.
- Similar use of these multiple strategies may improve other problems affecting patient outcomes.



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## Sustainability and Moving Forward

- Mobility Challenge – Pizza Party Winner (May 2018)
- QIA weekly mobility auditing
- Shout Outs
- Epic Documentation – John Hopkins Highest Level of Mobility (JH-HLM) Scale
- Mosaic Study



# Questions



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ICUdelirium.org



# Remaining limitations of everyday activities in patients who were treated in the intensive care unit

Therese Lindberg<sup>1, 2</sup>, Sofia Vikström<sup>2</sup>, Malin Regardt<sup>1, 3</sup>

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# Introduction

There is a known risk of sequels such as impaired occupational performance after being treated in the Intensive Care Unit. Today's ICU follow-up team does not include Occupational Therapist even though the known risk of impaired occupational performance.

This study was conducted as a compliment to another study by doctor Peter Sackey and Anna Milton called PROGRESS-ICU.

# Objectives

To describe what categories of everyday activities patients treated in the ICU experience difficulties in and their occupational performance/satisfaction three to six months' post discharge from the ICU

To investigate correlations between occupational performance and severity of illness and quality of life

# Method I

In total 24 participants were interviewed three to six months after discharge from the ICU

Patients characteristics	
Age (year) Medina (min-max)	67 (26-77)
Gender female/male	10/14
Surgery/medical/trauma*	12/6/5
Acute/elective*	17/6
Ventilator yes/no*	14/9
Sepsis yes/no*	5/18
APACHE II (score) Median (Q <sub>1</sub> -Q <sub>3</sub> )	17 (11-21)

# Method II

## Measures

- The Canadian Occupational Performance Measure (COPM) to describe in what categories patients experience difficulty in and to estimate their occupational performance and satisfaction (scale 1-10)
- APACHE-II to describe severity of illness (scale 0-72)
- Short Form-36 (SF-36) to describe quality of life (scale 0-100)

# Results

## Distribution in percent between the categories of COPM

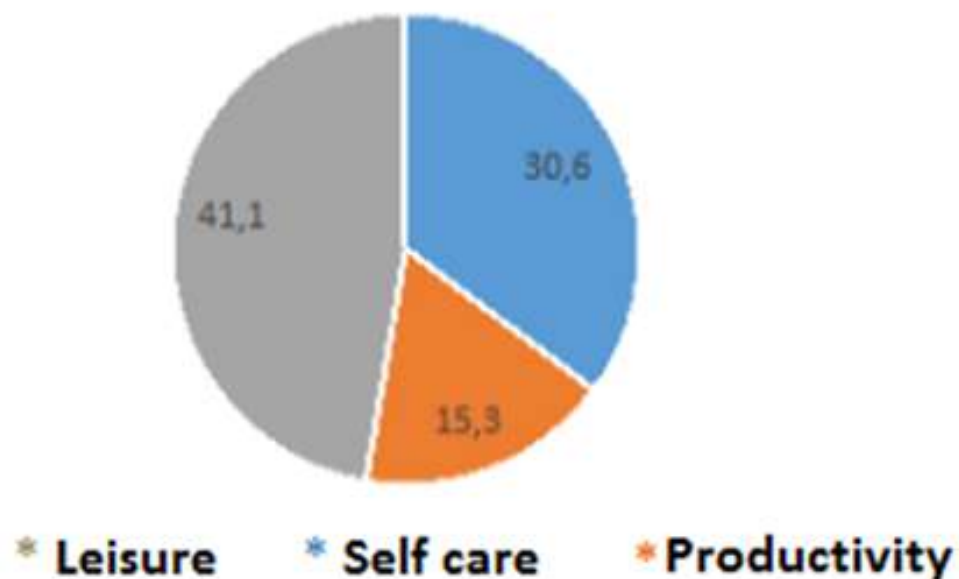


Figure 1, 72 activities were perceived as difficult, leisure (n=39), followed by self-care (n=22) and productivity (n=11)

# Results I

Categories of COPM	Performance (1-10)	Satisfaction (1-10)
Leisure	3.4	2.3
Self-care	3.0	2.7
Productivity	3.8	3.8

Tabel 2, Median experienced occupational performance/satisfaction per category



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UNIVERSITETSSJUKHUSET

## Results II

Moderate to high correlations was found between occupational performance/satisfaction and high score on APACHE-II ( $-0.51 > r_s < -0.50$ ;  $p < 0.016$ ) and quality of life ( $-0.54 > r_s < -0.47$ ;  $p < 0.023$ )



# Conclusion

Indicator for occupational therapy in the ICU.

Occupational therapist could raise awareness regarding activities in the category leisure to a greater extent.

# Acknowledgment

- The participants
- Malin Regardt PhD, OT
- Sofia Vikström PhD OT
- Peter Sackey PhD, MD
- Anna Milton PhD, MD
- Sini Gröhn Nordh OT
- Johanna Fors OT



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# PROLONGED MECHANICAL VENTILATION WEANING AT LTACH'S:

## DOES MOBILIZATION INFLUENCE OUTCOMES?

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Postdoctoral Fellow – College of Nursing  
T32 NRO11147-06A1  
Pain and Associated Symptoms  
The University of Iowa

Franco Laghi, MD – Loyola University  
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Eileen Collins, PhD, RN -UIC



College of  
Nursing

# Conflict of Interest

## Funding Sources

- ❑ Select Medical Corporation – Research Grant
- ❑ University of Iowa College of Nursing - T32 NR011147
- ❑ University of Illinois at Chicago College of Nursing – Internal Research Grant



## Background & Purpose

Examine the relationship between the frequency of physical therapy assisted mobilization interventions of:

- ❑ *bedside dangling*
- ❑ *stand-turn-pivot to an out-of-bed chair*
- ❑ *ambulation*

on ventilator liberation and mortality of patients receiving PMV at a Midwestern LTACH.

# Design

- ❑ Retrospective medical record review
- ❑ Convenience sample
  - *All patients requiring PMV admitted between January 1, 2008, and December 31, 2015*
  - *352 charts were screened for inclusion*
  - *249 Final Selected Sample*
- ❑ Midwestern Urban 50-bed LTACH



# Inclusion and Exclusion Criteria

## Inclusion Criteria

- Mechanically ventilated for 21 days or more
- Presence of tracheostomy before or during LTACH hospitalization
- Age  $\geq 21$
- Hemodynamic Stability on admission

## Exclusion Criteria

- Co-morbid neurologic conditions that would interfere with limb exercises
- Admission for home ventilator training
- Long-term/chronic vent patient admitted for treatment of concomitant medical condition
- Previous inclusion in study from prior admission
- Incomplete medical record documentation with >10% of data missing on variables of interest



# Measures: Present at Time of Admission to LTACH

## Demographics

- ☐ Age
- ☐ Gender
- ☐ Month and Year of Admission
- ☐ Short-term hospital LOS
- ☐ Underlying etiology for PMV

## Clinical Indicators

- ☐ Vital Signs
  - Temp in F
  - Blood Pressure
  - Heart Rate
  - Respiratory Rate
  - FiO2% on ventilator
- ☐ Weight in Kg
- ☐ Charlson Co-Morbidity Index

# Operationalization of Mobility

Each occurrence of the  
3 mobility  
interventions was  
extracted

Calculated aggregated  
total

Calculated weekly  
averages

- $\text{sum} / \text{LTACH length of stay} * 7$

## Measures: Outcome

### Ventilator Liberation

- 10 Liberated
  - 10 Yes
  - 10 No
- 10 # of Ventilator Days

### Discharge Disposition

- 10 Alive vs deceased
- 10 LTACH LOS

# Overall Sample Demographics

	Mean ( $\pm$ SD)
Age (years)	68.6( $\pm$ 14.0)
Weight (kg)	94.1( $\pm$ 36.6)
Charlson Score	5.9( $\pm$ 2.8)
STACH LOS (days)	26.4( $\pm$ 17.0)
Gender	<i>n</i> (%)
Male	122 (49%)
Female	127(51%)

Underlying Etiology of PMV	<i>n</i> (%)
Cardiac	27(10.8)
<b>CV Surgery</b>	<b>52(20.9%)</b>
<b>Respiratory</b>	<b>64(25.7%)</b>
Neurologic	30(12.0%)
Trauma	21(8.4%)
Oncology	14(5.6%)
GI	20(8.0%)
Infection/Sepsis	16(7.6%)
Renal/Endocrine	2(<1%)

# Outcomes

LTACH Outcomes	Mean( $\pm$ SD)
LTACH LOS (days)	35.9( $\pm$ 16.2)
# Ventilator Days	20.5( $\pm$ 15.8)
Liberated	<i>n</i> (%)
Yes	172(69.1%)
No	77(30.1%)
Deceased	<i>n</i> (%)
Yes	62(24.9%)
No	187(75.1%)

## Results

**Not all patients participated in mobilization**

22 (8.8%) never progressed beyond passive range of motion therapies provided in the hospital bed

12 (54.4%) survived to discharge

Only 4 (33.3%) of these 12 survivors liberated from mechanical ventilation

# Weekly Mobility Summary Statistics

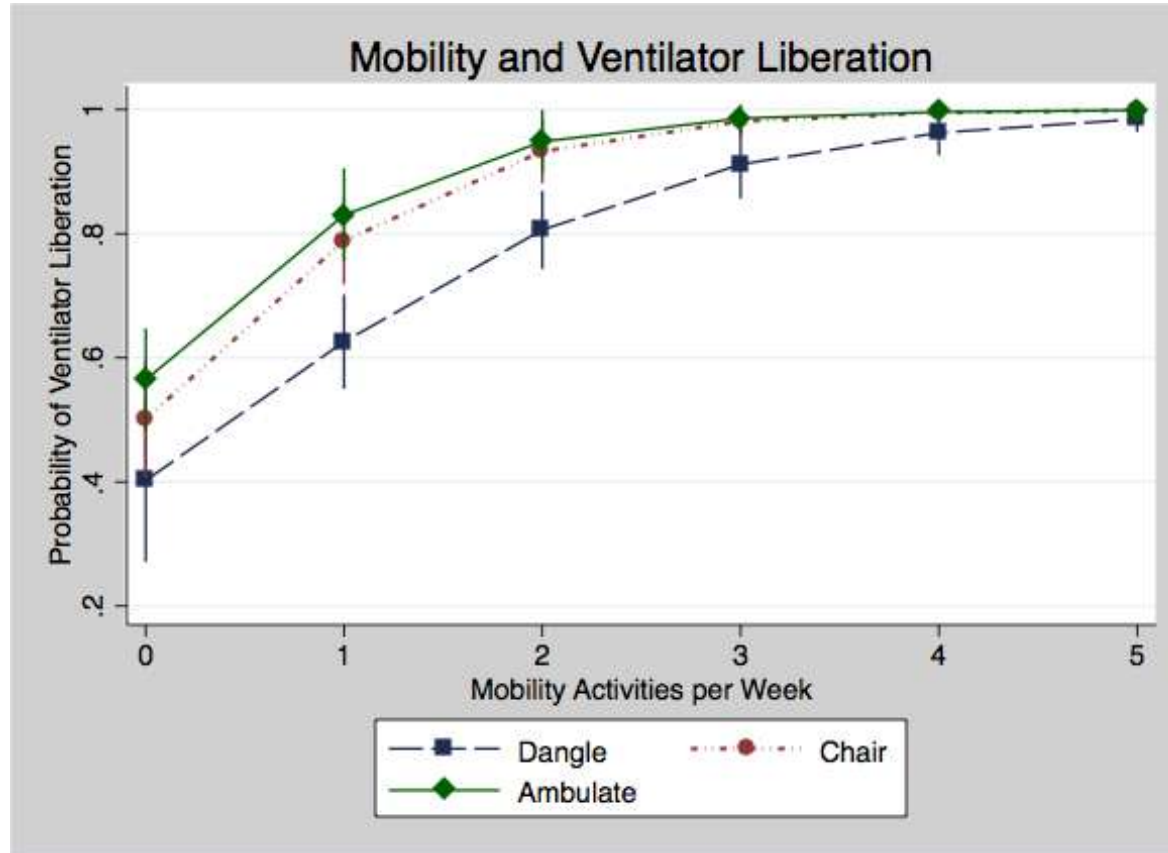
	<i>n</i>	Mean	SD	Min	Max
Frequency					
Dangle/wk	206	1.58	1.02	0	4.15
Chair/wk	141	0.98	1.13	0	4.28
Ambulate/wk	112	.077	1.09	0	4.2

# Logistic Regression: Association of Frequency of Mobility to LTACH Outcomes

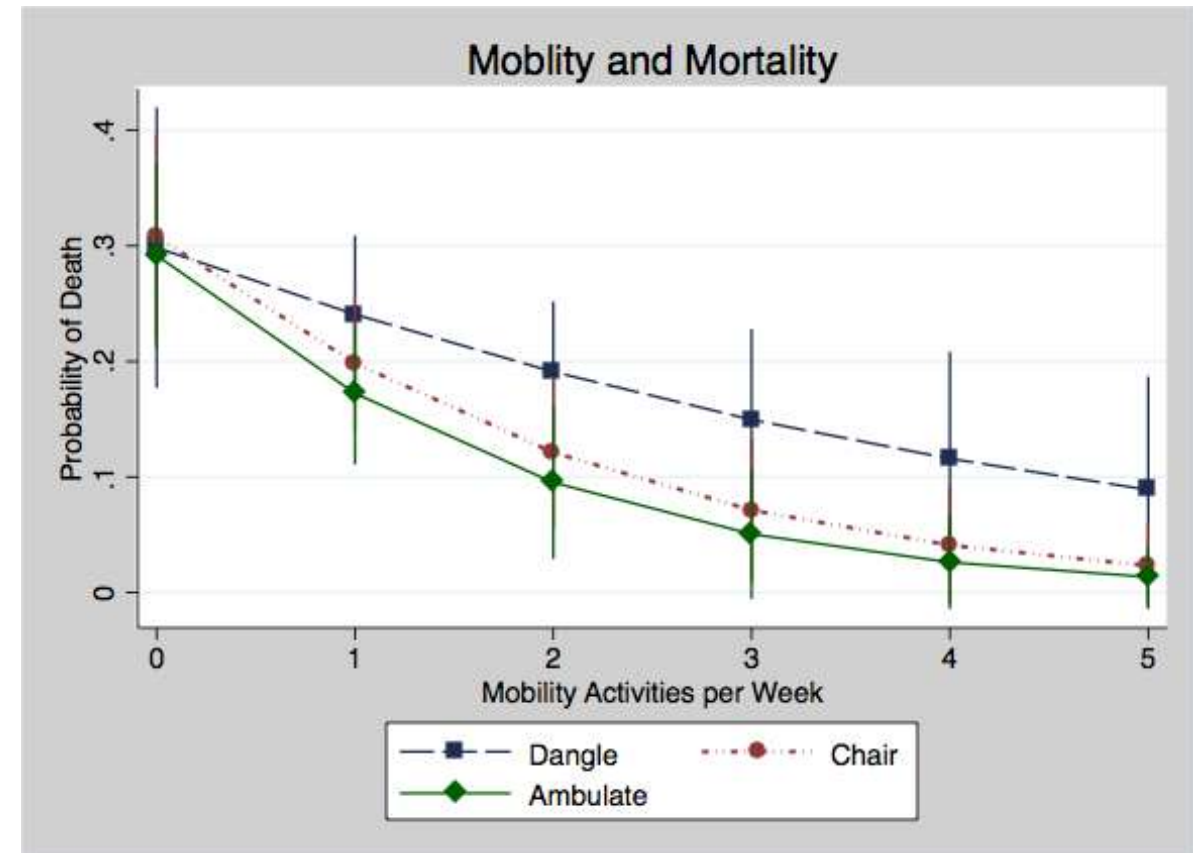
	OR	SE	z	p-value	95% CI
Ventilator Liberation					
Dangle	2.485	0.447	5.06	<0.001	1.747,3.535
Chair	3.711	0.904	5.38	<0.001	2.30,5.983
Ambulation	3.766	1.090	4.58	<0.001	2.135,6.642
Mortality					
Dangle	0.745	0.123	-1.78	0.076	0.538,1.031
Chair	0.557	0.106	-3.09	0.002	0.384,0.807
Ambulation	0.506	0.111	-3.11	0.002	0.329,0.777



## Predicted Probabilities Frequency and Ventilator Liberation



## Predicted Probabilities Frequency and Mortality





## Conclusion

There is a relationship between the frequency of PT assisted mobility interventions on the probability of ventilator liberation and survival for patients on PMV at LTACHs

Lack of mobilization is a risk factor related to ventilator dependence and death for patients on PMV at LTACH's

Patients with higher frequencies of PT assisted mobility interventions are most likely to liberate from mechanical ventilation and survive their LTACH hospitalization

# Thank You

[heather-dunn@uiowa.edu](mailto:heather-dunn@uiowa.edu)

## Geisinger's Post ICU Clinic - First Year Cohort Outcomes

---

Kenneth P Snell MD, Cynthia Beiter RN, Andrea Berger MAS,  
Lester Kirchner PhD, Anthony Junod PhD, Bradley Wilson PhD,  
Randy Fulton PhD, Janet Tomcavage RN MSN, Erin Hall Psy D,  
Karen Korzick MD MA

Society of Critical Care Medicine  
THRIVE Initiative – ICU Survivor Clinic  
Collaborative



- Limited on review of the world literature on PCIS/PICS/Survivor Clinics
- PCIS clinics do not appear to have a robust impact on patient perceptions of their quality of life as reported on standardized tools.
- No prior reports of a mortality benefit.
- No prior reports of a readmission rate reduction benefit.
- Difference between statistical significance (research perspective) and financial/operational significance and/or impact (health care systems perspective.)



# Rationale for why we chose to construct our process as we did:

# Geisinger

- Elderly population in central PA
  - Not as facile with electronic tools
  - Not as enamored of computer/email/on line access role in healthcare
  - Wanted to avoid “questionnaire burnout”
- No benefit shown on abbreviated or prolonged assessments of patient reported quality of life indicators
- Literature on impact of ICU stay on elements of Behavioral and Neurocognitive Health on ICU survivors (Herridge et al, Bienvenu et al, Mikkelsen et al)
- Literature on utilization of health care in hospital survivors with PTSD for one year following index hospital admission (Davydow et al CCM 2014; 42:2473-2481)

- Created over late 2015 to 2016 in negotiation with GHP, CCM Leadership, BH Leadership
  - First patient seen in November 2016
- Funding: GHP - RN Case Manager
- Clinic staff consists of:
  - RN Case Manager
  - Neuropsychology and Clinical Psychology (joined March 1, 2017)
  - Intensivist



## INCLUSION CRITERIA:

- GHP insured, or GMC based GHP primary care provider – both Medicare and Medicaid
- **SEPSIS**
- **RESPIRATORY FAILURE WITH 2 OR MORE DAYS ON VENTILATOR**
- **DELIRIUM OF 4 OR MORE DAYS DURATION**
- Agrees to enroll when approached

- Not expected to live to leave the ICU or hospital
- Discharge on home hospice status
- Discharge to an inpatient mental health facility
- In active treatment/supervision for substance addiction care



## Enrollment Process:

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- RN Case Manager gets daily EPIC report of eligible patients:  
GHP insureds in the ICU
- RN Case Manager then reviews EPIC chart to further screen for eligibility based on complete set of inclusion and exclusion criteria
- If eligible, approach made to describe program and offer enrollment
- As of Spring 2018 we are providing the mortality and readmission benefit data from the first year's cohort

- Too far to travel to Danville
- Too many doctors already
- Prefer care be provided/coordinated by PCP
- Copay – too many already, too high per copay



## Our Population Care Process:

Geisinger

### **1. SCREEN/ASSESS THE THREE DOMAINS IMPACTED BY ICU STAY/PICS:**

Behavioral Health

Neurocognitive Health

Physical Health

### **2. CREATE A COMPREHENSIVE PICS CARE PLAN FOR EACH PATIENT AND COORDINATE CARE NEEDED WITH PCP, SPECIALISTS.** Communication with PCP and specialists is key.

### **3. PATIENT AND FAMILY EDUCATION:**

Medical Issues

Navigating large, complex health system

### **4. FOLLOW PATIENT, ADVOCATE FOR AND COORDINATE CARE NEEDED UNTIL RESOLUTION OF PICS IS ACHIEVED.**

- Education prior to discharge and daily/weekly post discharge
- RN CM calls patient/support system average 2-3 times/week
- Plan to see in clinic within 1 month after return to home, then q 3 months for 1 year, biannually second year and once year three (changed to as needed 9 months into pilot)
- Full standard Case Management assessment
- Medication reconciliation
- Home assessments at discretion of RN CM
- Coordination of home based care if initially refused at discharge
- Coordination of care among multiple sub-specialists in terms of appointment reminders, transmittal of information to PCP if outside of EPIC system

- 1 hour with Behavioral Health
- 1 hour with Neurocognitive Health  
Abbreviated neurocognitive screening and education about neuro-recovery post severe illness
- 1 hour with CCM/IM and RN CM
- Bundled care visit from insurance/cost to patient perspective



## Behavioral Health

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- PHQ 9
- GAD 7
- Civilian PTSD Inventory
- Education, normalization of experiences in and persisting out of ICU for patient and primary care giver
- The clinic is part of the FTE for ICU Clinical Psychologist position





## Neurocognitive Health

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- For first year we screened everybody using a customized abbreviated battery of tests that takes about 40 minutes.
- Dr. Junod PhD, Fellow in the Neurocognitive Fellowship - supervised by Drs. Wilson and Fulton.
- This component is currently on a volunteer fellow and faculty basis; discussions are under way for an FTE allotment for future work in the clinic.

- **ICU Survivor Issue focused Review of Systems** - extensive
- **Education** as to what happened to them while in ICU and hospital
- **Medication Reconciliation**
- **Encounter Reconciliation**
- **Wellness Assessment of the Primary Caregiver**
- **Nutrition consult review and dietary care in recovery**, particularly sepsis patients; vitamin D
- **Expectation management** – time to recovery, “the new normal”
- **Rehabilitation Issues** – exercise, renewal of PT/OT services
- **End of life care discussion**, where appropriate



Caring

## **Follow Up Visits – 1 hour long MD, RN CM, Patient and Patient's Primary Caregiver Together**

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- RN CM and CCM/IM only
- Focuses on all issues identified in first visit:
  - ICU Survivor related ROS
  - Encounter reconciliation
  - Continued expectation management
  - Continued discussions regarding EOLC planning as appropriate
  - Continued coordination of care if BH, Neurocog, subspecialist care needed



## Follow Up:

Geisinger

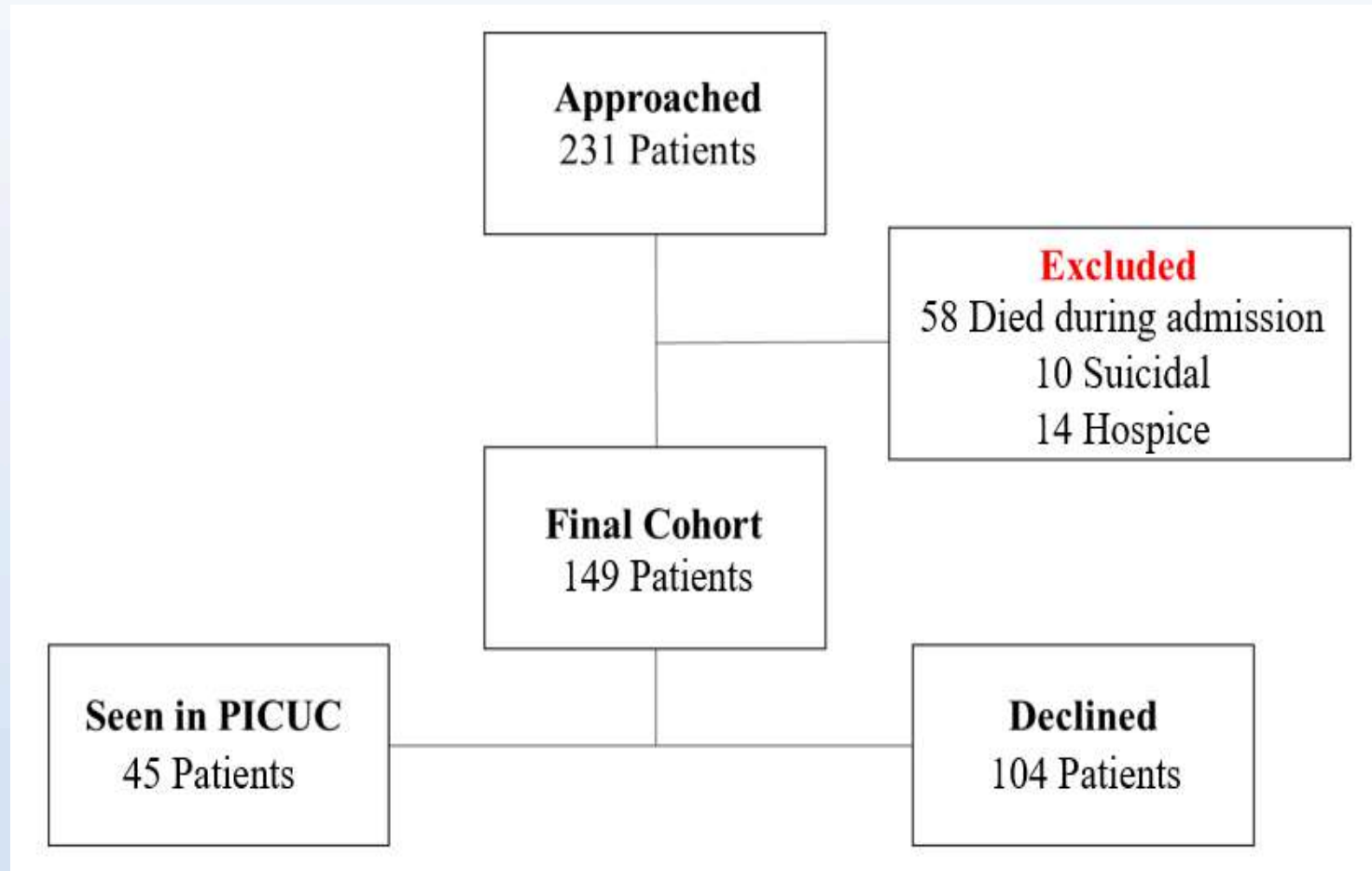
Frequency of follow up determined on a case by case basis:

20% d/c at first visit

20% followed 1 or more years

60% followed for 6-12 months

## FIRST YEAR COHORTS: 11/16 –10/17



There were **NO** significant differences seen in

- Age
- Sex
- ICU and Hospital LOS
- ICU admission APACHE IV score
- Charlson Comorbidity Index
- Concurrent ICU Comorbidities including DM, HTN, PVD, CAD, HF, Afib, COPD, Cancer, CVA, Liver disease, CKD
- Admission diagnosis
- Discharge disposition

### ***Significant differences:***

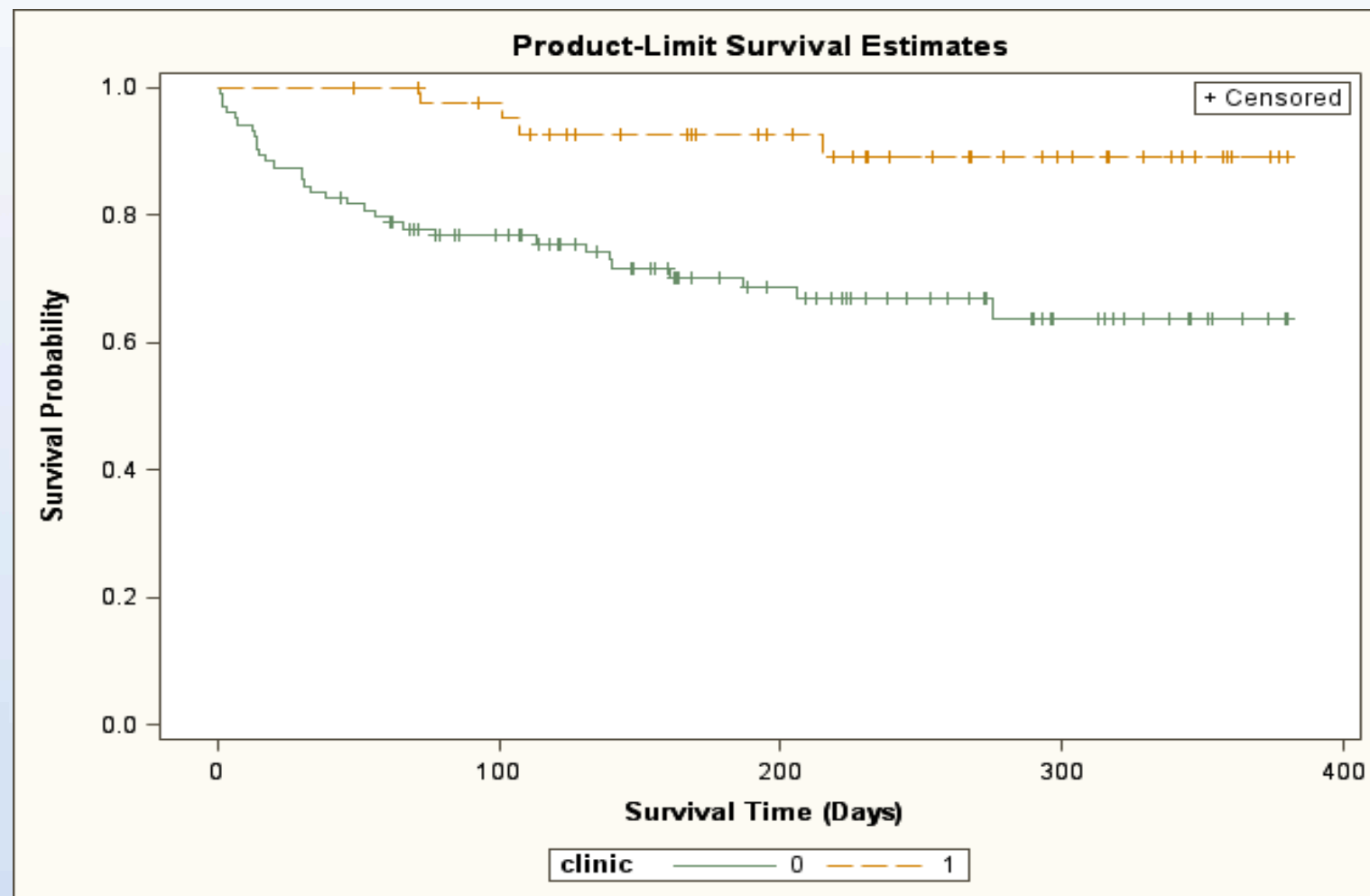
- Those seen in PICUC had higher BMIs, more OSA and a higher rate of mechanical ventilation during index admission

Variables	PICUC (n = 45)	Not PICUC (n = 104)	P-Value
	N (%)	N (%)	
Age, mean (S.D.)	62.2 (15.4)	64.0 (15.2)	0.5161
ICU Length of Stay, median (IQR)	5 (3, 8)	5 (3, 9)	0.4131
Hospital Length of Stay, median (IQR)	11 (6, 18)	9 (5, 15)	0.2645
APACHE IV Score, mean (S.D.)	57.2 (16.1)	55.7 (26.7)	0.6848
Charlson Comorbidity Index, mean (S.D.)	4.2 (3.1)	5.4 (3.3)	0.0578
BMI, median (IQR)	31 (26,39)	27 (24,32)	0.0087
Female	22 (48.9%)	43 (41.3%)	0.3940
Non-white	1 (2.2%)	1 (1.0%)	0.5142
DM	18 (40.0%)	42 (40.4%)	0.9649
HTN	23 (51.1%)	56 (53.8%)	0.7587
PVD	4 (8.9%)	6 (5.8%)	0.4902
HF	8 (17.8%)	25 (24.0%)	0.3981
CKD	5 (11.1%)	4 (3.8%)	0.1297
Neuromuscular Disease	1 (2.2%)	1 (1.0%)	0.5142
COPD	10 (22.2%)	16 (15.4%)	0.3127
AFIB	3 (6.7%)	8 (7.7%)	1.0000
CAD	9 (20.0%)	12 (11.5%)	0.1729
Cancer	1 (2.2%)	2 (1.9%)	1.0000
CVA	3 (6.7%)	4 (3.8%)	0.4318
OSA	3 (6.7%)	0 (0.0%)	0.0263
Liver Disease	0 (0.0%)	3 (2.9%)	0.5539
Admission Diagnosis			0.7977
Cardiac	3 (6.7%)	6 (5.8%)	
CNS	9 (20.0%)	20 (19.2%)	
Gastrointestinal	3 (6.7%)	6 (5.8%)	
Respiratory Failure	18 (40.0%)	42 (40.4%)	
Sepsis	7 (15.6%)	24 (23.1%)	
Trauma	5 (11.1%)	6 (5.8%)	
Ventilated	38 (84.4%)	69 (66.3%)	0.0242
Discharge Disposition			0.0617
Home	17 (37.8%)	27 (26.0%)	
Home with Health	16 (35.6%)	24 (23.1%)	
LTACH	0 (0.0%)	2 (1.9%)	
Rehab	6 (13.3%)	16 (15.4%)	
SNF	6 (13.3%)	35 (33.7%)	
Insurance			0.3953
Medicare	8 (17.8%)	13 (12.5%)	
GHP	37 (82.2%)	91 (87.5%)	
Renal Replacement Therapy	3 (6.7%)	13 (12.5%)	0.3933



# Kaplan Meier Curve

Geisinger



## Cox Proportional Hazard Model Mortality Analysis – Risk Adjusted Data

ICU SURVIVOR CLINIC  
COHORT

USUAL CARE COHORT

4 ( 8.9%)

32 ( 30.8%)

HR = 0.268      95% CI = 0.093, 0.774      p = 0.0149



## Stabilized Inverse Probability of Treatment Weight – Mortality Risk Adjusted Data

ICU SURVIVOR CLINIC  
COHORT

USUAL CARE COHORT

4 ( 7.8%)

32 ( 38.2%)

HR=0.181      95% CI = 0.058, 0.562      p = 0.0031

Readmissions	PICU Clinic Cohort	Usual Care Cohort
30 day	4 (8.9%)	24 (23.1%)
60 day	4 + 3 = 7 (15.6%)	24 + 7 = 31 (29.8%)
Statistics	HR = 0.353 95% CI = 0.123, 1.009 p= 0.0521	HR = 0.471 95% CI = 0.210, 1.054 p= 0.0668

Financial analysis completed by GHP Health Economists for clinic versus usual care cohort out to 30 and 60 days from each index admission.

Initial analysis excluded Medicaid patients as their data was unavailable.

Financial data analysis we present here is on approximately 9 months of enrollment from November 2016 to September 2017.

A complete health economics data set analysis for the entire first year cohort out to one year from index admission is underway and will be reported at a later date.



# Health Economics Analysis

Geisinger

30 day	ICU SURVIVOR CLINIC N= 28					USUAL CARE N= 79				
	Total Cost	# member with utilization	Average cost per member	# of visits	Average cost per visit	Total Cost	# member with utilization	Average cost per member	# of visits	Average cost per visit
ED + Obs cost	\$5,654	6	\$942	9	\$628	\$3,887	5	\$777	10	\$389
Readmit cost	\$10,196	2	\$5,098	2	\$5,098	\$166,678	14	\$11,906	16	\$10,417
Total post acute care/rehab cost	\$145,161	7	\$20,737	7	\$20,737	\$446,011	30	\$14,867	32	\$13,937
			Total Cost	Average per clinic member				Total Cost	Average per usual care member	
		Total Cost	\$ 320,899	\$ 11,461				Total Cost	\$ 922,863	\$ 11,682
		Patient Cost Share	\$ 9,932	\$ 355				Patient Cost Share	\$ 36,684	\$ 464



# Health Economics Analysis

Geisinger

60 day	ICU SURVIVOR CLINIC N= 28					USUAL CARE N= 79				
	Total Cost	# member with utilization	Average cost per member	# of visits	Average cost per visit	Total Cost	# member with utilization	Average cost per member	# of visits	Average cost per visit
ED + Obs cost	\$10,266	11	\$933	19	\$540	\$4,417	6	\$736	15	\$294
Readmit cost	\$23,729	3	\$7,910	4	\$5,932	\$231,695	17	\$13,629	20	\$11,585
Total post acute care/rehab cost	\$162,836	7	\$23,262	8	\$20,355	\$456,911	30	\$15,230	32	\$14,278
			Total Cost	Average per clinic member				Total Cost	Average per usual care member	
		Total Cost	\$ 432,554	\$ 15,448				Total Cost	\$ 18,778	
		Patient Cost Share	\$ 17,062	\$ 609				Patient Cost Share	\$ 557	



## Program Economics – 30 day

Geisinger

### SAVINGS:

4 avoided readmissions every 30 day epoch	$\$12,000 \times 4 = \$48,000$
Costs saved per member for the Plan	\$ 8,182
Costs saved per member for the member	<u>\$ 4,057</u>
	\$ 54,192

### COSTS:

RN CM	\$ 8,417
(Missing costs: MD, Psy D, PhD, clinic space)	<u>                    </u>

NET Savings for Plan/Patient for a 30 day epoch	\$ 44,817
---	-----------



# Why Hospital Administration Should Support the ICU Survivor Clinic

Geisinger

	ICU CLINIC COHORT N = 28		USUAL CARE COHORT N = 79	
	30 DAY	60 DAY	30 DAY	60 DAY
READMISSION RATE	6.7%	12.5%	16.8%	20.2%
AVERAGE LOS	1.5 DAYS	2.7 DAYS	6.1 DAYS	5.4 DAYS



# Why Hospital Administration Should Support the ICU Survivor Clinic

Geisinger

## 30 DAY READMISSIONS

## Patient Days

Patient days consumed for ICU Clinic Cohort Readmits	2.81
Patient days consumed for Usual Care Cohort Readmits	80.96
Patient days consumed if UC enrolled in ICU Survivor Clinic	7.93
Patient days potentially saved for other admissions	<b>73.03</b>
<b>3 day LOS – 24.3 patients/30 days</b>	<b>288/annually</b>
<b>4 day LOS - 18.25 patients/30 days</b>	<b>216/annually</b>
<b>5 day LOS – 14.6 patients/30 days</b>	<b>175/annually</b>





**Thank you to:**

Geisinger

Dr. A. Joseph Layon, past system CCM Chairperson for starting the ICU Survivor Clinic at Geisinger.

Dr. Paul Simonelli, current system PCCM Chairperson for continued support of the Clinic.

The Health Economics group at Geisinger Health Plan.

Geisinger Medical Center Pulmonary Clinic administrative and clinical staff:

Dr. Cathy Shoff, Medical Director, Pulmonary Clinic

LeAnn Conrad, Ops Manager, Pulmonary Clinic

Marie Sledgen RN, Nursing Manager, Pulmonary Clinic

Geisinger Health Sciences Library Staff:

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# Questions?

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# FIRST AID KIT FOR PICS

## POST INTENSIVE CARE SYNDROME



# 01. Introduction

- › More focus op PICS syndrome last decade
- › Prevention techniques



Anxiety



Depression

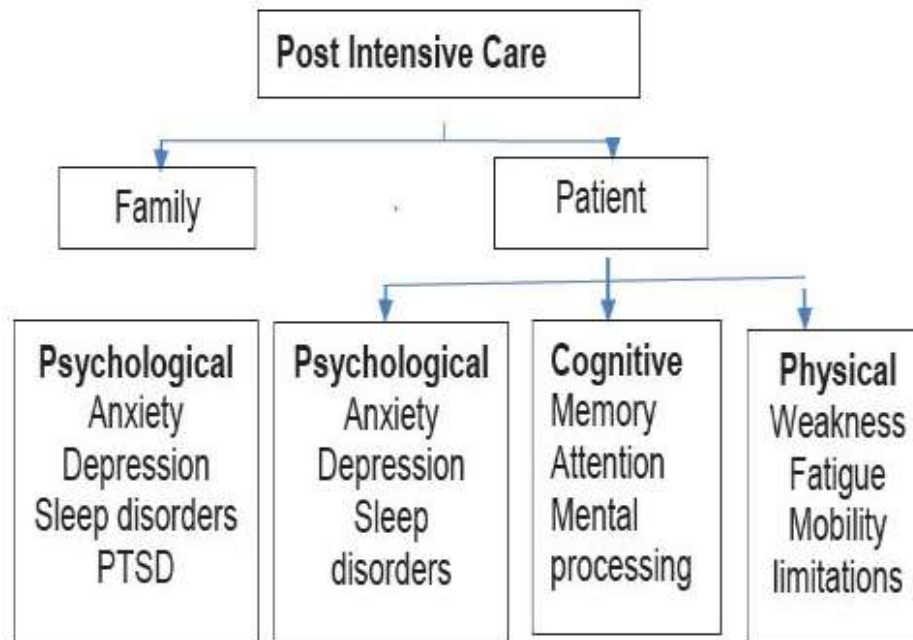
## 02. Definition

- › “PICS describes new or worse health problems after critical illness that remain after you leave the hospital. These problems can be with your body, thoughts, feelings or mind and may affect you or your family.”

SOCIETY OF CRITICAL CARE MEDICINE, 2012

## 02. Conceptualizing PICS

Figure 1. Post Intensive Care

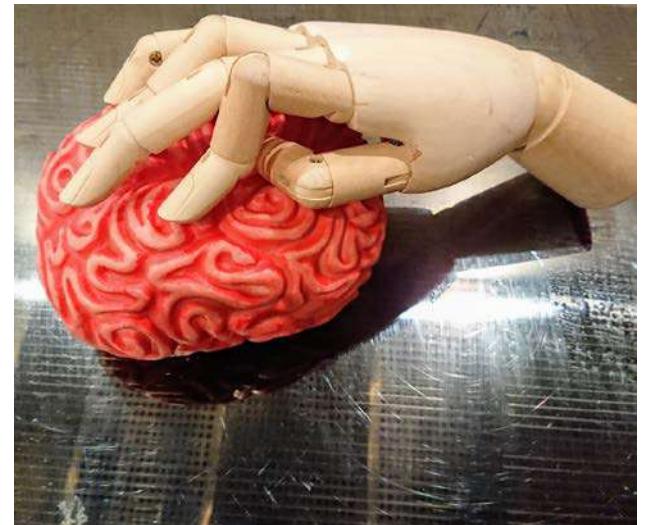


Adapted from Davidson JE, et al<sup>11</sup>

### 03. Cognitive impairments

- ▶ MOCA TEST: 50% of the patients 1 year after survival:  
an average of 19.2
- people with mild cognitive impairment (22.1)
- people with Alzheimer's disease (16.2)

- Slow processing speed
- Attention problems
- Executive function difficulties
- Word finding difficulties



Pandharipande PP et al. N Engl J Med. 2013;369:1306-1316

## 04. Physical impairments

- ▶ ICU-Acquired Weakness// Critical-illness polyneuropathy
- ▶ Prevalence: 25-80% of patients
- ▶ Fatigue
- ▶ Dyspnea
- ▶ Half of survivors do not return to work by 1-year follow-up
- ▶ ¼ do not return to work by 5-year follow-up



## 05. Mental health problems

### Depression, post-traumatic stress disorder, and functional disability in survivors of critical illness in the BRAIN-ICU study: a longitudinal cohort study

Feature	3mo Post-ICU	12mo Post-ICU
Depression	<ul style="list-style-type: none"><li>• 30% (no depression history)</li><li>• 52% (history of depression)</li></ul>	<ul style="list-style-type: none"><li>• 29% (no depression history)</li><li>• 43% (history of depression)</li></ul>
Post-traumatic stress disorder (PTSD)	<ul style="list-style-type: none"><li>• 7% related to critical illness</li><li>• 19-29% (symptoms of PTSD)</li></ul>	<ul style="list-style-type: none"><li>• 7% related to critical illness</li><li>• 19-28% (symptoms of PTSD)</li></ul>

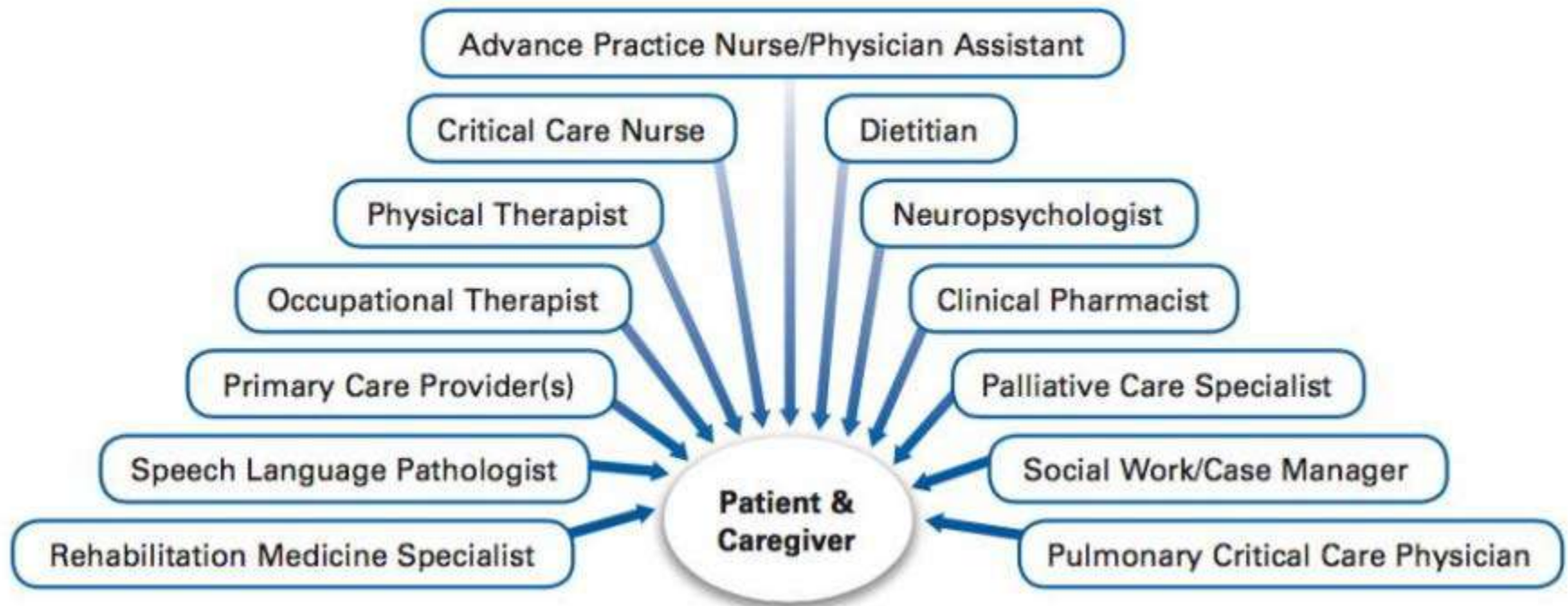
Jackson, J.C., et al. Lancet Resp Med, 2014; 2:369-7

## 06. PICS Family

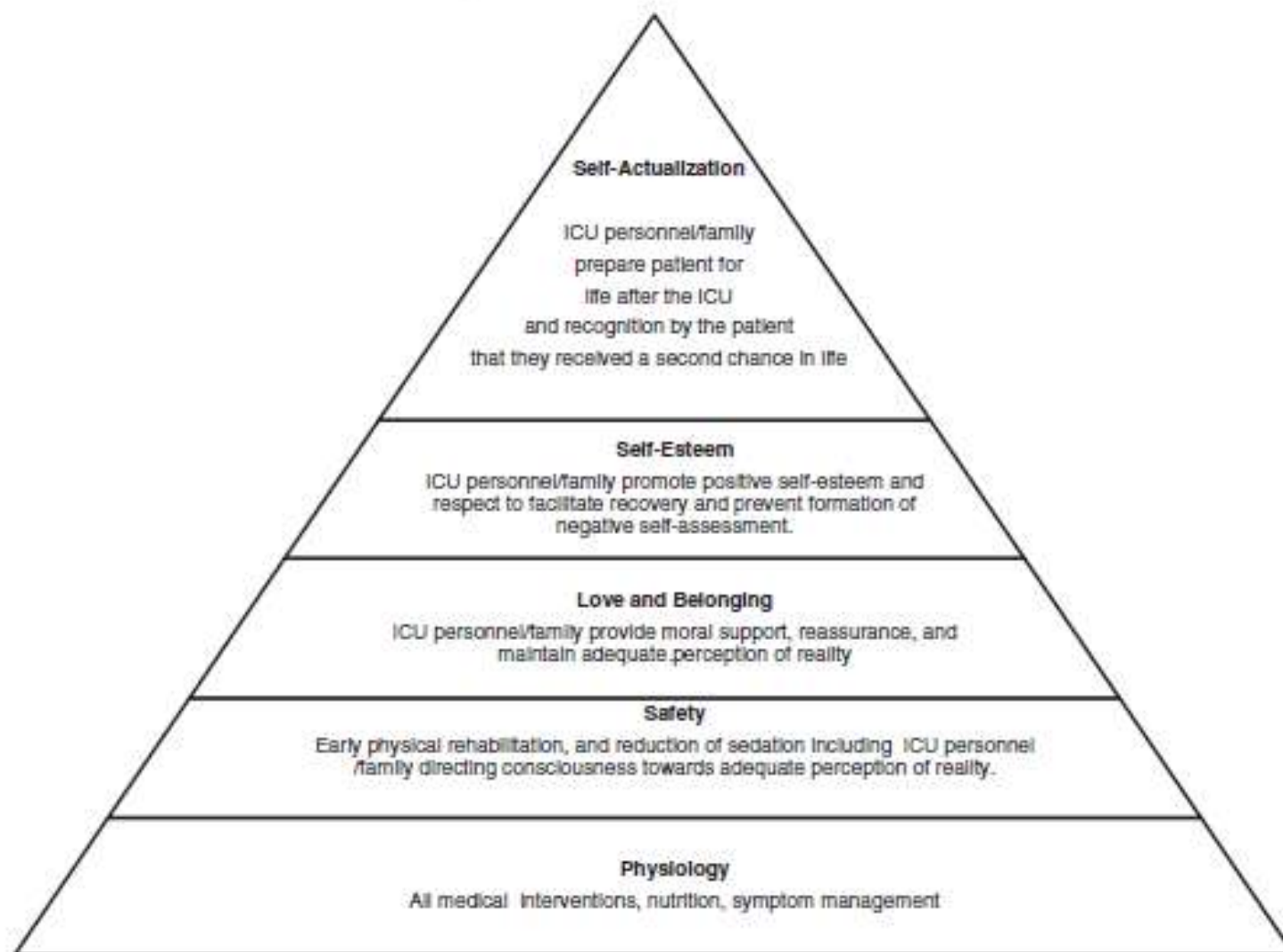
- ▶ Anxiety in 10-75% of family
  - ▶ PTSD symptoms 8-42% of family
  - ▶ Guilt and shame
  - ▶ 33% of family require medication for
  - ▶ anxiety or depression
  - ▶ Prolonged complicated grief
- 
- ▶ Family members experienced less stress when their loved-ones had made their potential end-of-life wishes clear.



## 07. Who should treat PICS?



Huggins, E.L. et al., AACN Adv Crit Care 2016; 27(2):204-211



**Fig. 1.** Maslow's hierarchy of needs for critically ill patients during an ICU stay.

## 08. Life after the ICU

- ▶ Survival IS NOT a Patient-Centered Endpoint
- ▶ QOL after ICU survival
- ▶ Managing patient and family expectations and providing education
- ▶ Screening general practitioners

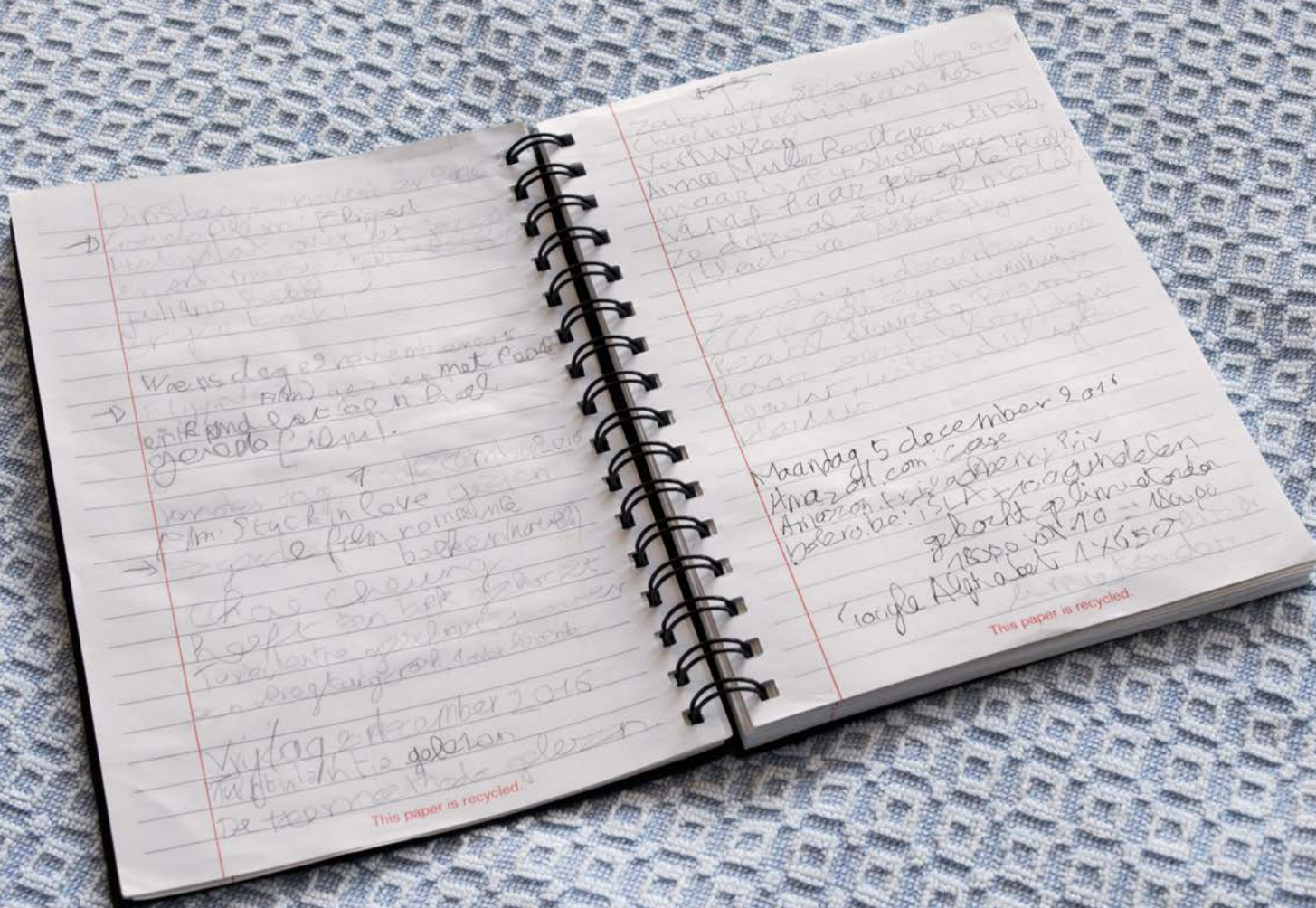
Schmidt, K., et al. JAMA 2016;315(24):2703-2711

## 09. Prevention Techniques

- Psycho-education patient, family, team
- Motivate to read/write
- Empowerment patient/family
- Diary (movie/pics)
- Orientation: GO OUTSIDE
- Early mobilization
- Art
- Music
- Support group
- EMDR (eye movement desensitisation reprocessing therapy)/ poster



# DIARY



# Art

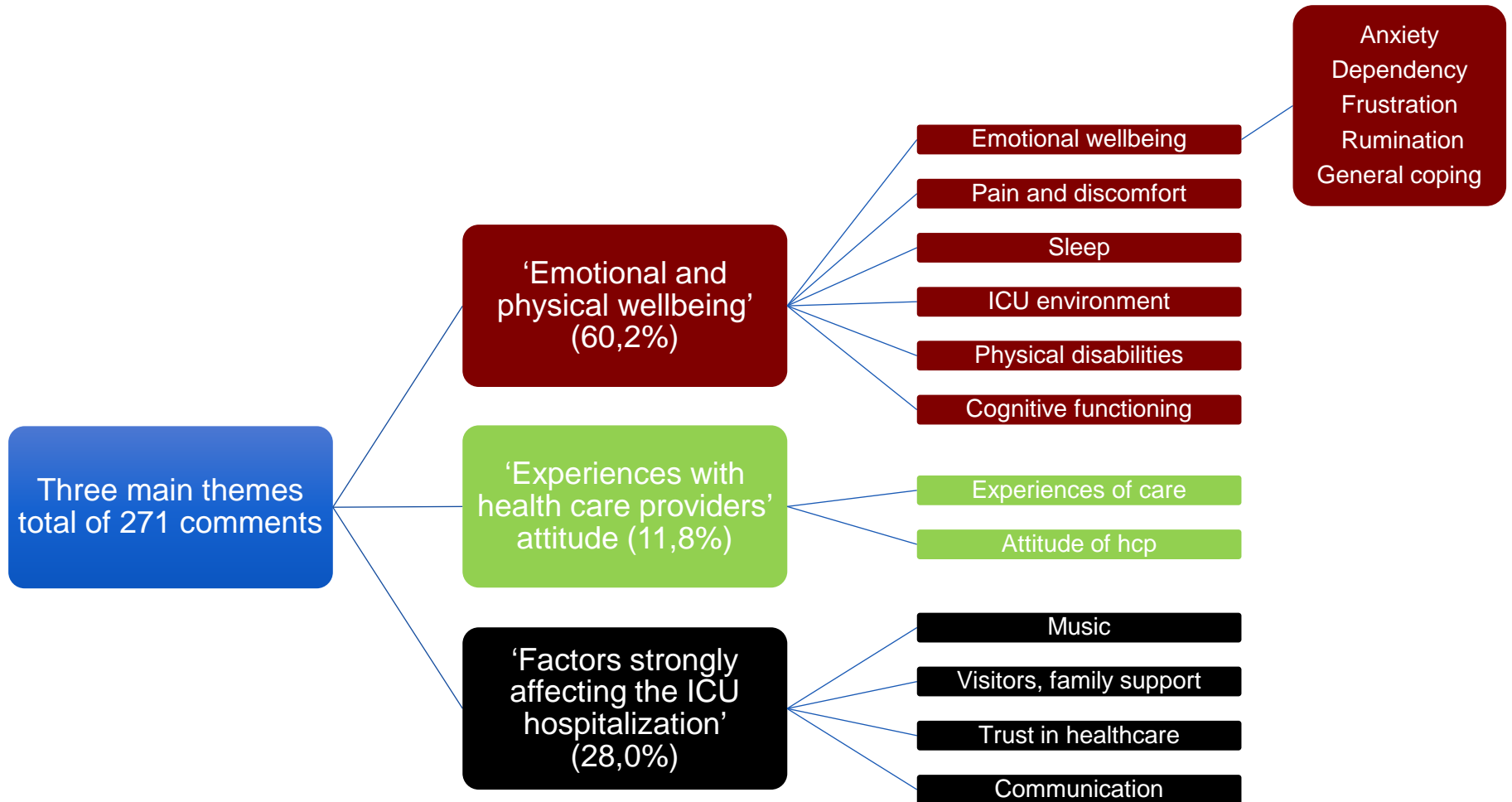


VERNISSAGE  
IN\FINITY ∞ ADEMLOOS  
20\12\2017





# Results MUSIC (2014-2016)



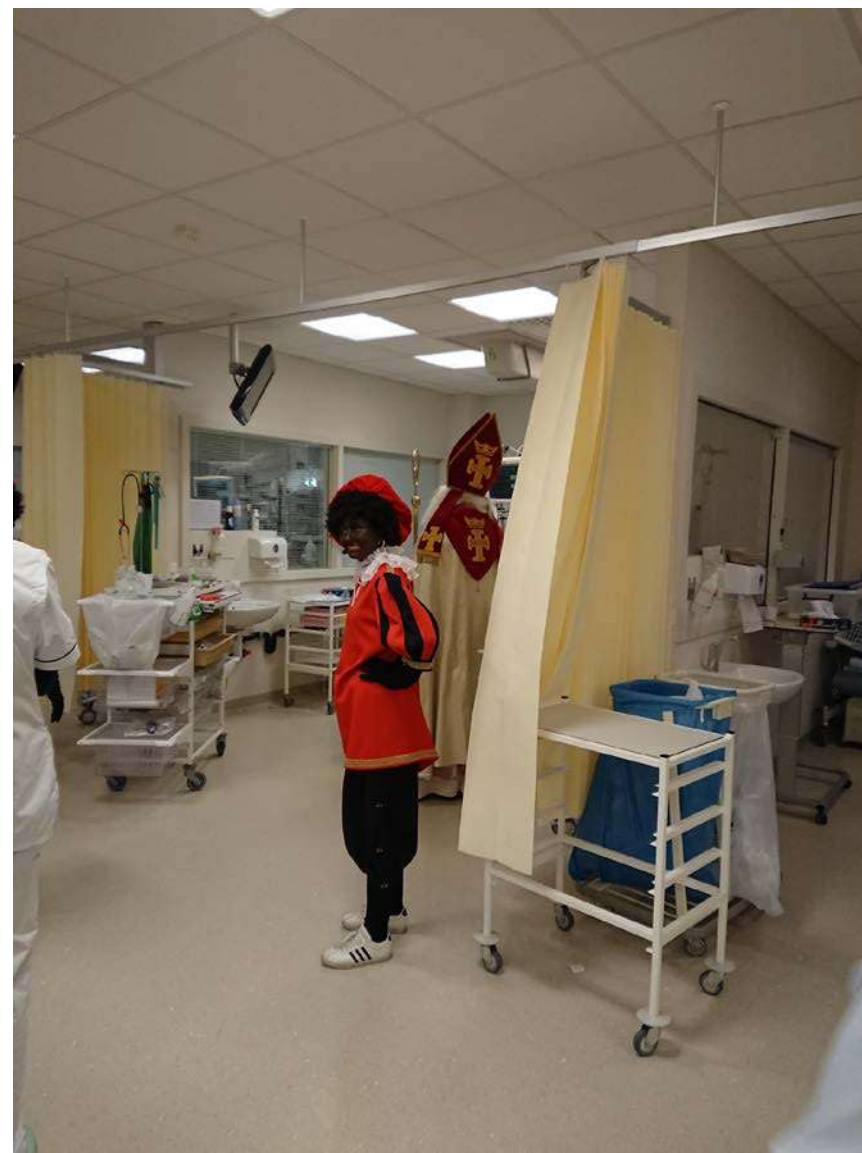
# Support Group UZ INTENS

- ▶ Collaboration between health care providers, patients and families after the ICU
- ▶ 8 times a year, drop-in meeting in DE KROOK, GHENT
- ▶ Art projects, Running Teams, Meeting Moments, scientific research

## SUPPORTGROUP



## SINT NICOLAAS



# RUNNING/WALKING

**RUNNING FOR UZ-INTENS**  
Ghent marathon  
28 oktober 2018

Loopteam ten voordele van UZ-INTENS, een supportgroep van het UZ Gent voor patiënten en hun familie na een opname op Intensieve zorg.

U KUNT ALS PATIENT, FAMILIELID, ZORGVERLENER ZELF MEEDOELEN: 5 / 10 / 21 OF 42,195 KM  
INFO + ROUTESCHRIJVING: [WWW.GHENTMARATHON.BE](http://WWW.GHENTMARATHON.BE)  
INFO + INSCHRIJVING: [bo.vandenbulcke@uzgent.be](mailto:bo.vandenbulcke@uzgent.be) / [stephanie.bracke@uzgent.be](mailto:stephanie.bracke@uzgent.be)

Inschrijven: 40 euro + voor 7 uur  
Prijs deelnemers: 30 euro  
Een gratis UZ-kaart  
Donnerdag 24 oktober 2018 - 10.00 uur  
Startpunt: 8042 0015 4482 4754 - VERVOLG DOELLEN  
in de vorm van een wandeling  
Eindepunt: 8042 0015 4482 4754 - 10.00 uur  
+ 100 + 1000 + 10000 + 100000 + 1000000  
aanmelding vóór 15/10/2018 (bijna afsluiting)

Inschrijven tot 15/10/2018

VOOR WORDEN:

U kunt als patiënt, familielid, zorgverlener samen 5 km wandelen op dit event  
Deze wandeling gebeurt in groep onder begeleiding van artsen, verpleegkundigen, kinesitherapeuten en andere zorgverleners  
De start van deze wandeling is om 11 u in de tent aan de toerpoorthal, Gent aan de Zwarte Tent 'UZ-INTENS'

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**WALKING FOR UZ-INTENS**  
Ghent marathon  
28 oktober 2018

Loopteam ten voordele van UZ-INTENS, een supportgroep van het UZ Gent voor patiënten en hun familie na een opname op Intensieve zorg.

U KUNT ALS PATIENT, FAMILIELID, ZORGVERLENER SAMEN 5 KM WANDELEN OP DIT EVENT  
DEZE WANDERING GEBEURT IN GROEP ONDER BEGELEIDING VAN ARTSEN, VERPLEEGKUNDIGEN, KINESITHERAPEUTEN EN ANDERE ZORGVERLENERS  
DE START VAN DEZE WANDERING IS OM 11 U IN DE TENT AAN DE TOERPOORTHAL, GENT AAN DE ZWARTE TENT 'UZ-INTENS'

INFO + INSCHRIJVING: [bo.vandenbulcke@uzgent.be](mailto:bo.vandenbulcke@uzgent.be) / [stephanie.bracke@uzgent.be](mailto:stephanie.bracke@uzgent.be)  
Inschrijven: 40 euro + voor 7 uur  
Prijs deelnemers: 30 euro  
Een gratis UZ-kaart  
Donnerdag 24 oktober 2018 - 10.00 uur  
Startpunt: 8042 0015 4482 4754 - VERVOLG DOELLEN  
in de vorm van een wandeling  
Eindepunt: 8042 0015 4482 4754 - 10.00 uur  
+ 100 + 1000 + 10000 + 100000 + 1000000  
aanmelding vóór 15/10/2018 (bijna afsluiting)

Inschrijven tot 15/10/2018

VOOR WORDEN:

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U kunt als patiënt, familielid, zorgverlener samen 5 km wandelen op dit event  
Deze wandeling gebeurt in groep onder begeleiding van artsen, verpleegkundigen, kinesitherapeuten en andere zorgverleners  
De start van deze wandeling is om 11 u in de tent aan de toerpoorthal, Gent aan de Zwarte Tent 'UZ-INTENS'



# Take Home Points

- ▶ PICS is a big deal for patients
- ▶ Families are affected by ICU too
- ▶ Transparency with patients and families – (both what we know & don't know)
- ▶ Further research is needed to guide patient/family centered outcomes
- ▶ – Not just survival!



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Volg ons op



Questions?



# Comparison of healthcare professionals experiences of the use of patient diaries from two intensive care units

Louise Roberts<sup>1</sup> and Joanne G. Outtrim<sup>2</sup>

<sup>1</sup>Neuroscience Critical Care Unit, Cambridge University Hospitals NHS Foundation Trust and <sup>2</sup>Division of Anaesthesia, University of Cambridge

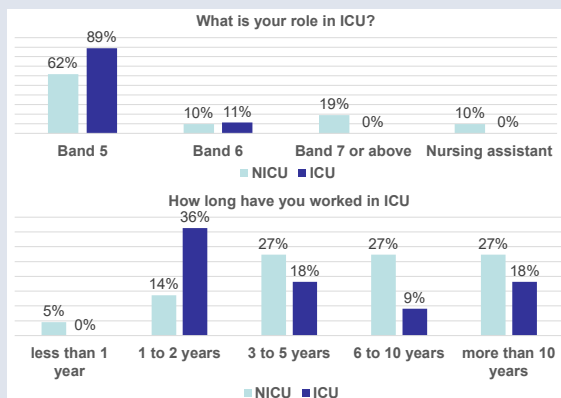
## Introduction

Hand written patient diaries have been used for many years within our general intensive care unit (ICU), whilst the neuro ICU (NICU) had been using electronic patient 'e-diaries' for only 6 months. Following the introduction of the electronic diary, we wanted to explore if there was a difference in the experience of healthcare professionals, writing in patient diaries across the two units.

## Methods

All healthcare professionals (~350) from two intensive care unit's at one hospital were invited to complete an anonymous survey via email.

A JISC Online Survey link was sent out via email, whilst printed copies were also made available. Staff were asked 13 questions which included open ended and basic staff demographics.



## Results

A total of forty-one responses were received equally across both units - 39 nurses and 2 nursing assistants. Interestingly no allied health professionals or doctors completed the survey's.

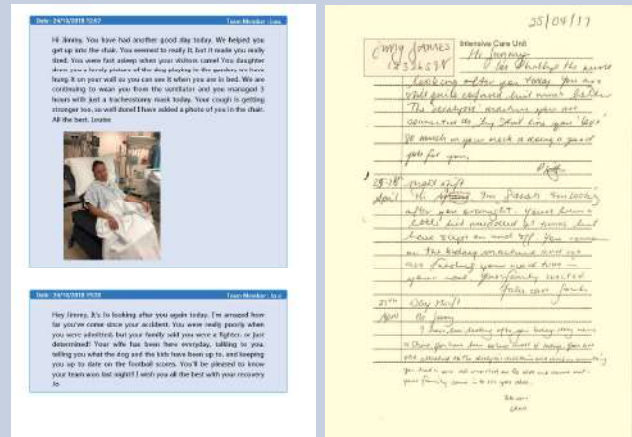
Despite the differences in their experience of using the diaries, there were many common themes. Staff on both units identified benefits of writing the diaries for both patients and their families, but also identified similar disadvantages.

*"I think they are a great tool for helping the patients fill in the gaps of their stay in ICU and prevent PTSD"*

*"It may be extremely difficult for the patient and their family to revisit events that occurred on the ICU"*

Some staff did acknowledge that patient diaries may be helpful for bereaved families.

*"Especially when a patient dies, just writing that one last note for the families."*



Example of pages of patient diaries from both ICU's

## Results (cont.)

Nurses on both ICU's identified similar barriers to completing the diaries, such as lack of time to write in the diaries, which some thought may have impact on how useful the diary may be to a patient.

*"When the patient is sick and busy there is often not time to do the diary."*

*"The gaps, when no one is writing and remembering some of the worst times of their lives."*

Staff on both units identified a need for more training on the benefits of the diaries, and what is acceptable content of the diaries.

*"I don't think we have had proper training on writing the diary"*

*"[Need information]...about what we should be writing".*

The main differences between the 2 ICU's were related to handwritten paper diaries, with requests from the general ICU to use the electronic diaries.

*"My handwriting is not good I suggest to do an online diary that would be better."*

## Conclusion

Overall, staff appreciate the benefit of the diaries, but still find it difficult to find the time to complete them.

We have plans to roll out the e-diary across both ICU's, which will hopefully facilitate the completion of the diary as part of normal clinical care. We also plan to have the diary added to the patient's electronic medical records.

The need for more training is highlighted, as is the need to further research the experience of patients and their families who have received a diary following a stay in ICU.



# Promoting Cognitive Function with Lighter Sedation Improves Outcome from Critical Illness Requiring ECMO Support

Frances Gilliland, DNP, CPNP-AC/PC, Caitlan Kailimai, BSN, RN, Jason Parker, D.O.

CVICU, Heart Institute, Johns Hopkins All Children's Hospital, St. Petersburg FL



## Introduction

Children who are critically ill often require analgesia and sedation to minimize pain and discomfort associated with invasive life sustaining devices, and to minimize metabolic demand and optimize oxygenation and ventilation. Currently there are no evidence-based guidelines for patients requiring extracorporeal membrane oxygenation (ECMO) (2). There is literature to suggest that deep sedation is associated with increased morbidity: delirium, drug tolerance, prolonged mechanical ventilation and ICU stay within the pediatric population (1). Significant opioid and sedative exposure with increased incidence of iatrogenic withdrawal is associated with the initiation of ECMO as described in a secondary analysis from the RESTORE study (3).

## Objective

To describe a demonstration of a light sedation strategy utilized for a patient requiring extracorporeal membrane oxygenation (ECMO) support for nine weeks and its impact on the mobility for the patient with critical illness.

## Hospital Course Describing Sedation

- HD 1: 11 y.o. female presents with acute respiratory failure secondary to influenza B and MRSA pneumonia requiring rapid escalation of support including oscillation ventilation, vasoactive infusions and requiring VV ECMO on HD 2 to support end organ function.
- HD 1-3: Utilized midazolam, fentanyl and rocuronium for sedation and neuromuscular blockade to optimize oxygenation.
- HD 3-6: Discontinued rocuronium and weaned off midazolam and fentanyl over 72 hours.
- HD 7-70: Restarted and remained on midazolam and morphine for sedation and pain control. Child life consulted to facilitate coping. Communication tools included flash cards and iPad.
- HD 8-15 and 33-35: Utilization of dexmedetomidine as adjunct sedation therapy.
- HD 66-96: Transitioned to enteral valium, methadone and clonidine for iatrogenic withdrawal and weaned over the course of 4 weeks.
- Pain scales utilized included FLACC, Faces and Numeric 1-10. No sedation scoring tools were used. WAT-1 scoring tool utilized for monitoring of withdrawal. (HD: Hospital Day)

Day of Cannulation	Patient Total Dose (Dosing wt 65 kg)	RESTORE Secondary Analysis (3)
Opioid	Fentanyl 31.5 mcg/kg (Infusion+bolus)	Morphine 3.7 mg/kg (Infusion)
Benzodiazepine	Midazolam 1.14 mg/kg (Infusion+bolus)	Midazolam 2.8 mg/kg (Infusion)

Cumulative Dose While on ECMO	Patient Mean Cumulative Dose (Dosing wt 65 kg)	RESTORE Secondary Analysis (3) Mean Cumulative Dose
Opioid	0.56 mg/kg/day (Infusion+bolus)	9.7 mg/kg/day
Benzodiazepine	0.43 mg/kg/day (Infusion+bolus)	9.4 mg/kg/day

Significant Characteristics	Case Study	RESTORE Secondary Analysis Patient Characteristics of ECMO Patients
Age	11 years old	Median age at admission to PICU 4.2 (0.8-12)
Therapies/ABCDEF ICU Bundle Similarities	PT and OT ordered on HD 2, followed at minimum 3 times per week. Child Life and family interaction well described in notes. No sedation algorithm.	Sedation algorithm for 29 of the 61 pt's enrolled in study. OT/PT not described.

## Hospital Course Describing ICU Course

- HD 2-6: Placed and remained on VV ECMO for ARDS secondary to influenza B and MRSA pneumonia complicated with sepsis.
- HD 6-34: Converted and remained on VA ECMO to improve end organ function. 6 day course of plasmapheresis for thrombocytopenia associated with multi-organ dysfunction (TAMOF).
- HD 34-70: Converted and remained on VV ECMO after failed attempt at weaning ECMO support.
- HD 64: Tracheostomy for anticipated need for long term mechanical ventilation.
- HD 70: Weaned from ECMO support.
- HD 72: Out of bed and in chair.
- HD 75: Ambulated 5 steps.
- HD 86: Ambulated 220 feet.
- HD 95 : Weaned off of mechanical ventilation.
- HD 97 Transferred to medical floor.
- HD 110: Ambulated 1000 feet with 2 breaks.
- HD 112: Discharged home.

- Tracheostomy decannulation on day 139 from onset of critical illness.

## Conclusion

- Lighter sedation can be achieved with prolonged critical illness with cumulative daily dosing of both opioid and sedatives below recent published data.
- Lighter sedation promotes mobility through critical illness to improve patient outcomes.

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all we do all for kids™



# Progress of Early Mobility Program in Oncology ICU Over 2-Year Period

Authors: Lindsay Riggs, PT, DPT; Michele Weber, DNP, RN, APRN-CNS, APRN-NP, CCRN, CCNS, OCN, AOCNS

Institutions: The Ohio State University Comprehensive Cancer Center – The James Cancer Hospital and Solove Research Institute

The James



## Objectives

To demonstrate progress of patient outcomes in oncology Intensive Care Unit (ICU) after initiation of early mobility program. Goal of program was to improve functional status, decrease incidence of delirium, and enhance overall patient outcomes in two dedicated oncology ICU's. Elements of the ABCDEF Bundle were incorporated and highlighted to assist with advancement of the early mobility program. The Society of Critical Care Medicine's ABCDEF Bundle was an evidence-based project designed to optimize ICU outcomes<sup>1</sup>. The project was completed over an 18 month period at 77 hospital units in the United States. The bundle includes elements of assessing and managing pain, breathing and awakening trials, choice of medication, delirium, exercise, and family involvement.

## Methods

Interdisciplinary rounding began in February 2016 with a group which included a physical therapist, a clinical nurse specialist, and a physician and/or nurse practitioner. The team continues to perform bedside rounds on each patient daily. APMAC outcome measures were initiated by PT and OT to demonstrate patient functional status. RN's assessed CAM-ICU to determine prevalence of delirium. RN's assessed RASS to identify level of agitation/sedation.

As the result of initiating the early mobility program, changes were implemented across multiple disciplines to improve ICU outcomes. Changes included:

- Increased physical and occupational therapy staffing
- Implementation of interdisciplinary mobility rounds
- Increased discussions about mobility on daily rounds
- Pulmonary fellows focused project
- Interdisciplinary team attending ICU mobility conference
- Presented nursing and respiratory perspectives at rehab team inservice
- Invited a national mobility expert to grand rounds



Photo left depicts team rounding-physical therapist, nurse practitioner, and clinical nurse specialist. Photo right shows physical therapy session in ICU.



## Results

Baseline and quarters 1-4 of data were part of the ABCDEF bundle / ICU Liberation project which included Medical ICU oncology and non-oncology ICU patients.

Over the course of two years, there has been improvement in the following measures:

- Highest level of mobility achieved during course of ICU stay
- Decreased prevalence of delirium
- Mobilization earlier in the ICU stay

The August 2018 data is a convenience sample of patients who stayed in our oncology ICU's during that month.

August 2018 data highlights:

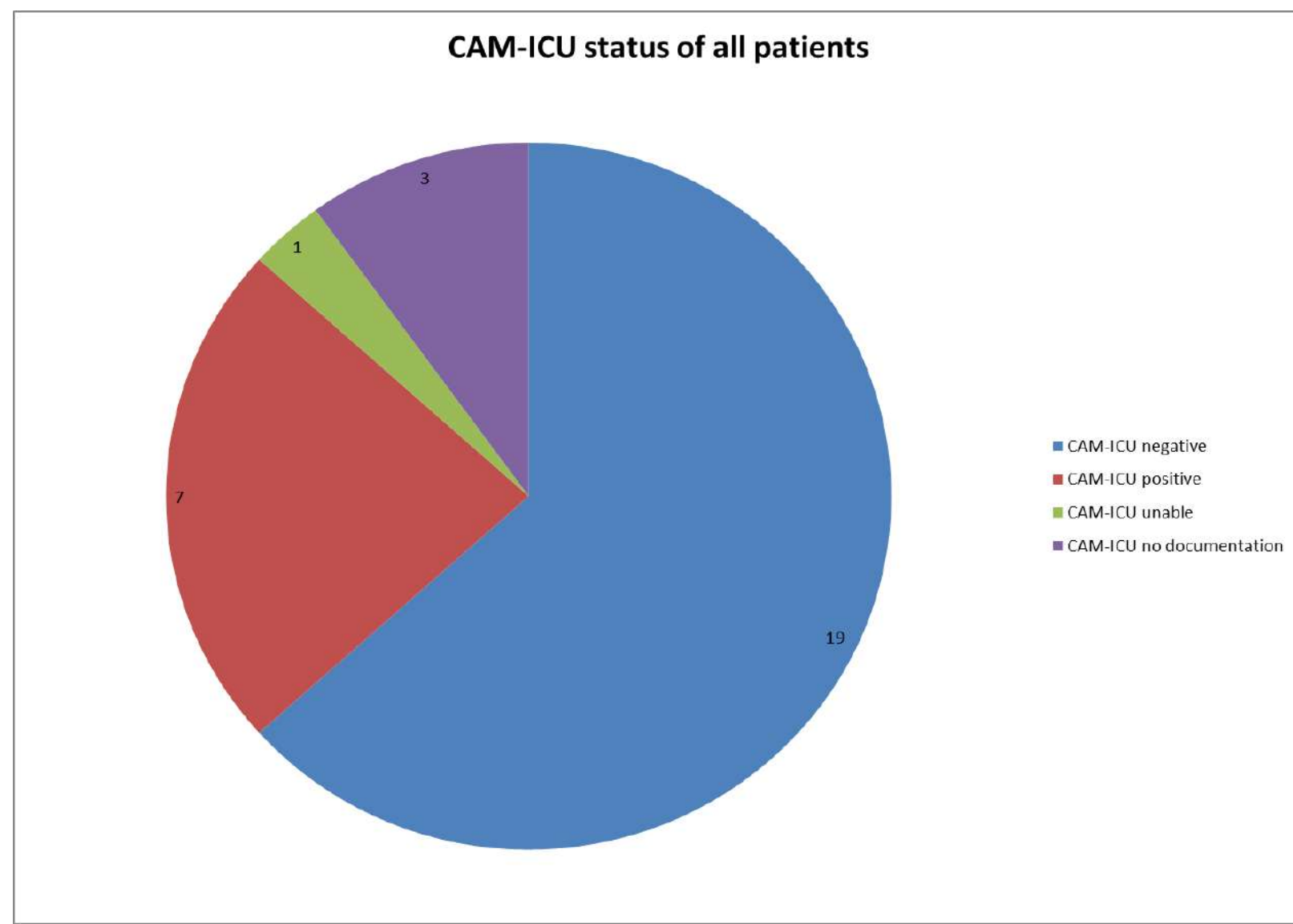
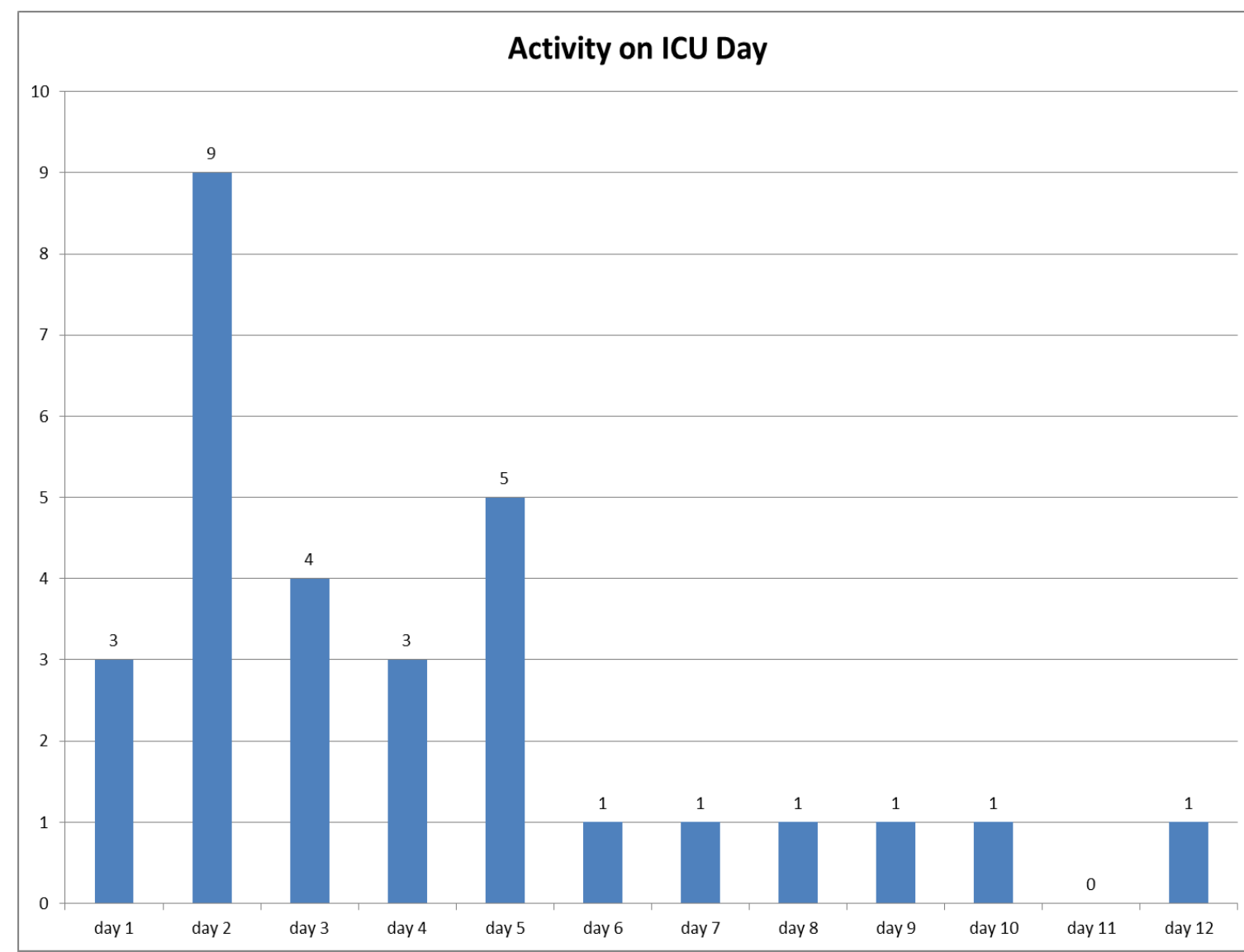
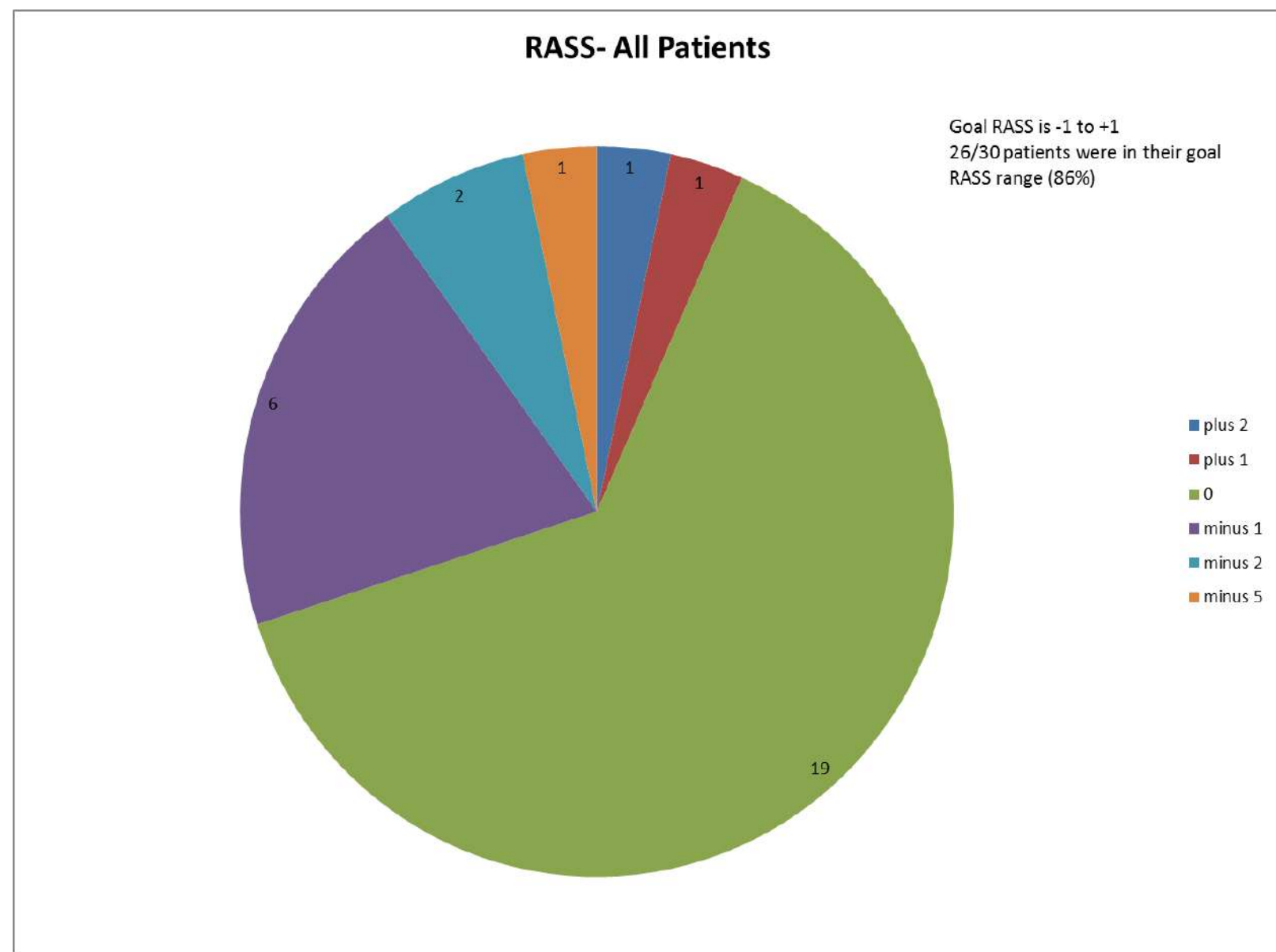
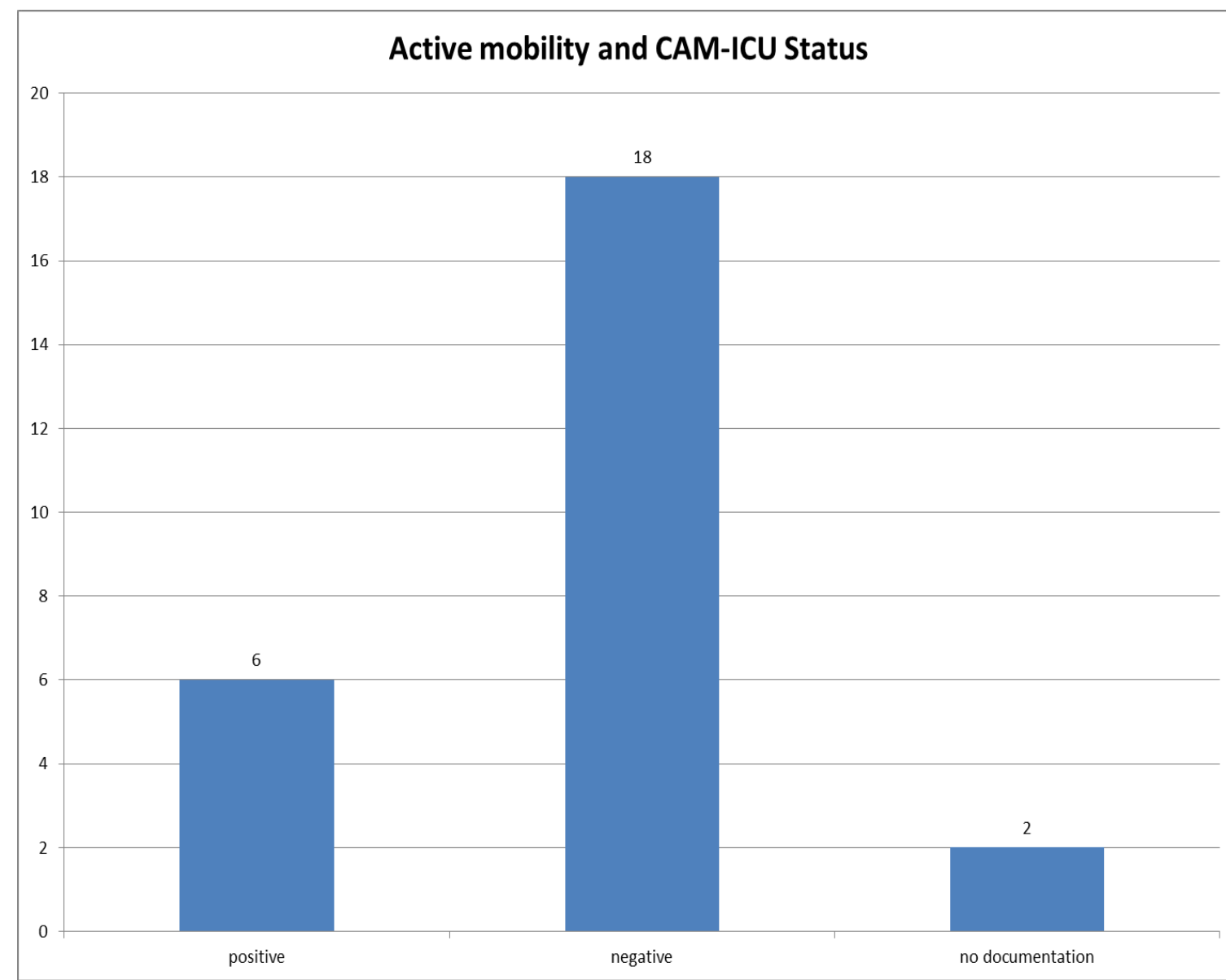
- 30% walking during their ICU stay
- 40% sitting edge of bed during their ICU stay
- 80% mobilizing regardless of CAM-ICU status
- 86% with a RASS score between -1 and +1
- 63% were mobilizing within 72 hours of ICU admission

### Highest Level of Mobility – All Patients

	Baseline (Jan- June 2015) N=39	Quarter 1 (Feb- Mar-Apr 2016) N=100	Quarter 2 (May- June- July 2016) N=71	Quarter 3 (Aug- Sept-Oct 2016) N=38	Quarter 4 (Nov- Dec 2016-Jan 2017) N=68	August 2018 N=30
	% of patient days					
Active ROM	77%	19%	20%	N/A	N/A	NA
Dangle	0%	7%	8%	5%	25%	37%
Stand	3%	4%	6%	8%	12%	3%
Out of bed to chair	15%	39%	38%	26%	32%	17%
Walk in room	0%	22%	25%	53%	27%	17%
Walk in hall	5%	9%	3%	8%	4%	13%

### Highest Level of Mobility – Mechanically Ventilated Patients

	Baseline (Dec. 2015) N=6	Quarter 1 (Apr-May- Jun 2016) N=21	Quarter 2 (July-Aug- Sept 2016) N=13	Quarter 3 (Oct-Nov- Dec 2016) N=6	Quarter 4 (Jan-Feb- Mar 2017) N=11	August 2018 N=10
	% of patient days					
Active ROM	100%	38%	23%	N/A	N/A	No documentati on=20%
Dangle	0%	5%	23%	17%	27%	40%
Stand	0%	0%	0%	17%	27%	0%
Out of bed to chair	0%	24%	23%	33%	37%	10%
March in place	0%	0%	15%	0%	0%	0%
Walk in room	0%	9%	15%	33%	9%	20%
Walk in hall	0%	24%	0%	0%	0%	10%



Graphs above represent patient status from August 2018 data collection. Top left shows CAM-ICU status of mobilized patients. Top right is RASS scores documented by nursing staff for all study patients. Bottom left indicated ICU day on first day of mobilization. Bottom right CAM-ICU status of all patients documented by nursing staff.

## Conclusions

There is currently limited evidence on implementing and the efficacy of an early mobilization program in an oncology ICU<sup>3</sup>. Oncology patients are at increased risk of deconditioning and other complications due to their treatment. They can benefit from a formalized rehabilitation program while in the ICU. The program implementation has shown progress in achieving higher levels of mobility while in the ICU and improved functional status at ICU discharge.

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# INFINITY ∞ BREATHLESS: Art project with patients in the ICU

## Introduction

After intensive care treatment, patients sometimes suffer from post traumatic stress (Sukantarat et al, 2007; Cuthbertson et al, 2004; Jones et al, 2001). An ICU stay can shatter personal narratives. The issues arising from the psychological effects of critical illness can be both immediate and long term (Pattison and Dolan, 2009). Turning traumatic events into stories is considered crucial to recovering psychologically from overwhelming life experience (Meichenbaum, 2006). Through art we help patients reconstructing their narratives (Puetz, 2013).

## Objectives and hypotheses

O1: To help ICU patients and family coping with difficult ICU experiences.  
O2: To help ICU team members understand which emotions ICU patients and family members experience.  
H: Art pictures help relieving symptoms of anxiety and depression (PICS symptoms). Art pictures help the ICU team deepen their own emotions and understand those of the patients.

## Results

Using a qualitative approach, we used two focus groups to evaluate the art weekend. Themes that emerge from analysis: *'emotional relief, better understanding, more open communication between staff and families'*.

## Conclusions

Art, like we used in our ICU project, can help to heal emotional wounds (symptoms of anxiety, loneliness, and other PTSD symptoms). Also staff emphasized the importance of art as a mode of expression that transforms thoughts and emotions into a unique form of communication.

## Patient and team experiences

**"Art on prescription, this project supported our mindset as a couple, we better understand eachothers' perspectives and emotions."** (Katleen, ICU patient)

**"Focusing on the most frightening experiences during the making of INFINITY ∞ Breathless, helped me seeing the big picture of my ICU stay"** (Mathew, ICU patient)

**"Working with artists in our ICU department, gives us a greater insight in the deeper emotions of our patients, but also how our own emotions appear to us."** (ICU physician)

## Acknowledgement

We would like to thank all participating patients and families, clinicians and artists Mr. Jorge Leon and Mr. Philippe Braquenier. We thank the management of the Ghent University Hospital, ICU Department for funding this project.



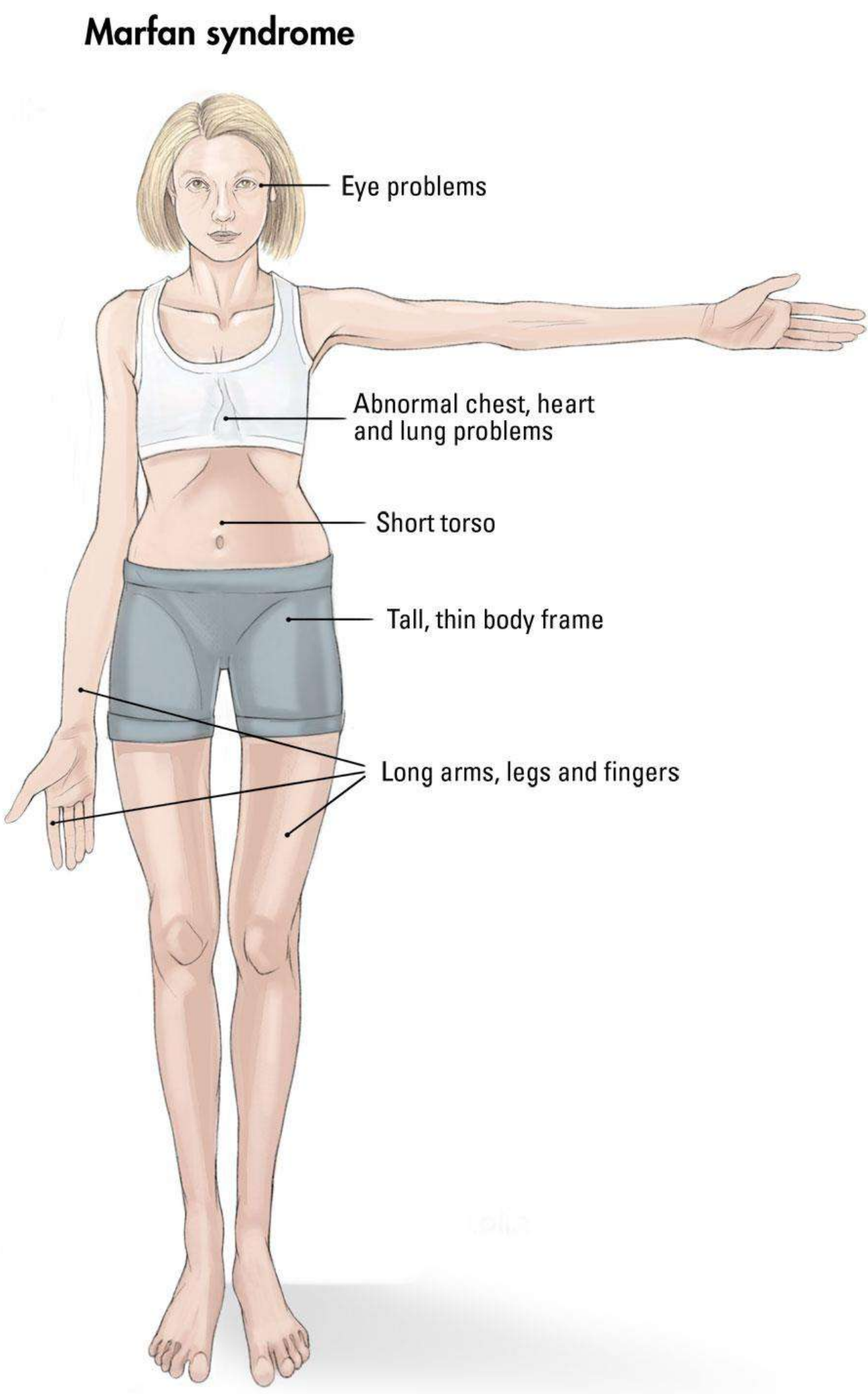


# A Case Study: Can Early Rehabilitation be Done Safely in a Complex, Cardiac Patient with Congenital Cardiac Disease?

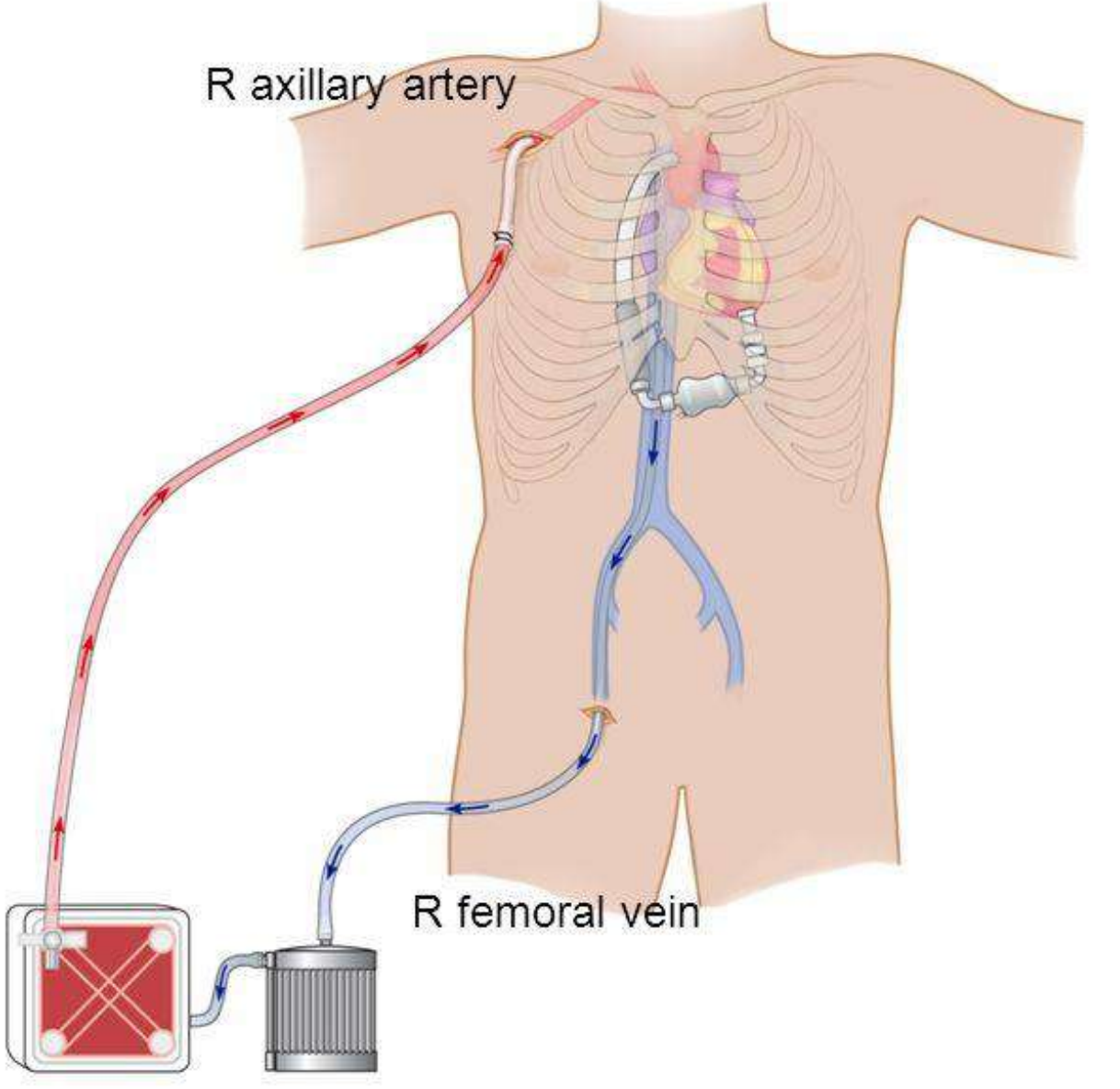
Marisa Glasser, MPT and Cynthia K Fine, MSN, CRRN  
Columbia University Irving Medical Center

## Introduction

The purpose of this case presentation is to demonstrate the safety, efficacy and challenges of mobilizing a complex cardiac patient with a congenital disease and the physical/medical complications associated with the disease process.



MARFAN’S SYNDROME



VA ECMO

## Case Description

### HPI:

- 49 year old male admitted from an Outside Hospital for Transplant/LVAD workup. Deemed a poor transplant candidate due to body habitus and intrathoracic scarring.
- Married, with 4 children. Attorney.
- Lives in private home in NJ.
- Prior to admission independent in mobility, dyspnea with household distances.

### PMH:

- Marfan’s Syndrome, s/p ascending aortic arch repair with AVR, A-fib, Idiopathic Non-ischemic dilated cardiomyopathy with EF of 12%, pectus excavatum with restrictive lung disease, Thoraco-abdominal aneurysm repair (2013), HTN, non-restrictive CAD.

### HOSPITAL COURSE:

- 7/26/16: admitted to CCU from OSH
- 7/27/16: evaluated by PT in CCU with diagnosis of CHF. Ambulated 12’ x 2. + dyspnea on 6L O2.
- 8/08/16: s/p Heart Mate II LVAD (intra-peritoneal placement) with AV closure as destination therapy. VA ECMO placed secondary to severe vasoplegia (R femoral/R axillary)
- 8/11/16: To OR for chest closure.
- 8/15/16: VA ECMO decannulated.
- 8/18/16: Cardiac PT Re-evaluation. Intubated, awake and alert. Bed mobility, dangled for 10 minutes. Noted B foot drop.
- 8/19/16: s/p tracheostomy.
- 8/22/16: Bed mobility performed with max assist x 2.
- 8/25/16: Hypoxic arrest due to mucous plugging while on trach collar.
- 8/29/16: Dependent transfer to stretcher chair. Impaired head, neck and trunk control. Trach to ventilator on FiO2: 40%
- 9/07/16: Bed mobility mod assist. Sitting at edge of bed with contact guard. Stand pivot transfer with mod assist x 2.
- 9/14/16: Chest CT: complete collapse of L lower lobe due to mucous plug, s/p bronch. Bed mobility min-mod assist, transfers: min assist x 2 with platform rolling walker (PRW).
- 9/15/16: First Walk. Ambulated 8’ min assist x 2 with PRW.
- 9/16/16: Ambulated 15’ min A x 2 with PRW and AFO’s. Transfers mod assist x 2.
- 9/27/16: Ambulated 150’ min assist with PRW.
- 9/28/16: Bed mobility min assist x 1. Ambulated 300’ min A with PRW.
- 9/29/16: s/p EVAR with bilateral femoral cut downs for infra renal aneurysm.
- 10/19/16 – 11/1/16: Progressively increased ambulation distance up to 600ft with CS/CG and PRW.
- 11/2/16: Transferred to step-down.
- 12/5/16: EMG showed bilateral fibular neuropathy. R > L.
- 12/12/16: s/p tracheostomy decannulation.
- 12/21/16: Transferred to acute rehab.

## Treatment Challenges

### Safety Considerations:

- Height: 6’8”
- Mobilizing a patient with multiple life support devices (trach to vent and LVAD) in an environmentally challenging ICU.
- Connected to multiple IV’s, tubes and wires.

### Medical Issues:

- Marfan’s Syndrome
- Pectus excavatum with restrictive lung disease.
- DCM with EF 12%.
- Malnourished.
- Pneumonia with copious secretions.
- Trach to vent.
- Bilateral foot drop.
- Prior cardiothoracic surgeries (Type B aortic dissection and AAA repairs).
- Chronic coughing with sternal pain and overall fatigue limiting participation in PT sessions.



HEART MATE II

## Conclusion

Early Mobilization provided this patient the ability to overcome severe debilitation in an ICU setting.

Early mobilization assisted this patient in finding strategies to achieve his goals in a challenging environment.

With an interdisciplinary approach, i.e. PT, OT, ST, MD, NP, RT, RN we were able to maximize his physical/medical potential.

His will to live was fueled by his love for his children and to support them through their future goals.



PLATFORM ROLLING WALKER

### Acknowledgements

The Early Mobilization Team in the CTICU and our patients and families.

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# Development of a Nurse-Driven Early Mobility Protocol in the Intensive Care Unit

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WellSpan Ephrata Community Hospital: Intensive Care Unit

## BACKGROUND

- Most if not all patients experience prolonged bedrest in the Intensive Care Unit (ICU), especially patients on the ventilator. Prolonged bedrest often leads to many other problems like: mobility issues, sleep disturbance, delirium, altered nutrition, increased length of stay in the hospital, and an increased burden to the health care system. These issues can be addressed with early exercise and mobility programs. Nurse driven early mobility programs have been shown to decrease the duration of ICU delirium and ventilator days. Research points to very positive outcomes in ICUs that have implemented nurse driven early mobility protocols. The key is to develop a culture of mobility champions.



## PRACTICE QUESTION

- The purpose of this single center practice project is to determine whether the implementation of a nurse driven early mobility protocol in ICU would reduce ICU length of stay (LOS).
- The purpose of early mobility is to introduce evidenced-based research related to nurse driven mobility programs, which are designed to maintain baseline mobility, decrease delirium, and decrease ventilator days. The goals of this program are to promote a multidisciplinary approach, and focus on early mobility as part of daily routines. A mobility protocol was initiated on every patient when hemodynamically stable, with the patient being mobilized at least twice a day.

## EBP MODEL

John Hopkins PICO Nursing Evidenced-Based Practice Model was utilized.

## SYNTHESIS OF EVIDENCE

- Research articles identified on CINHAL database. Fifteen articles reviewed, five were of good quality to answer the question. All the studies researched pointed to positive outcomes in ICUs that have implemented nurse driven early mobility protocols.

## PRACTICE RECOMMENDATIONS/ CHANGES

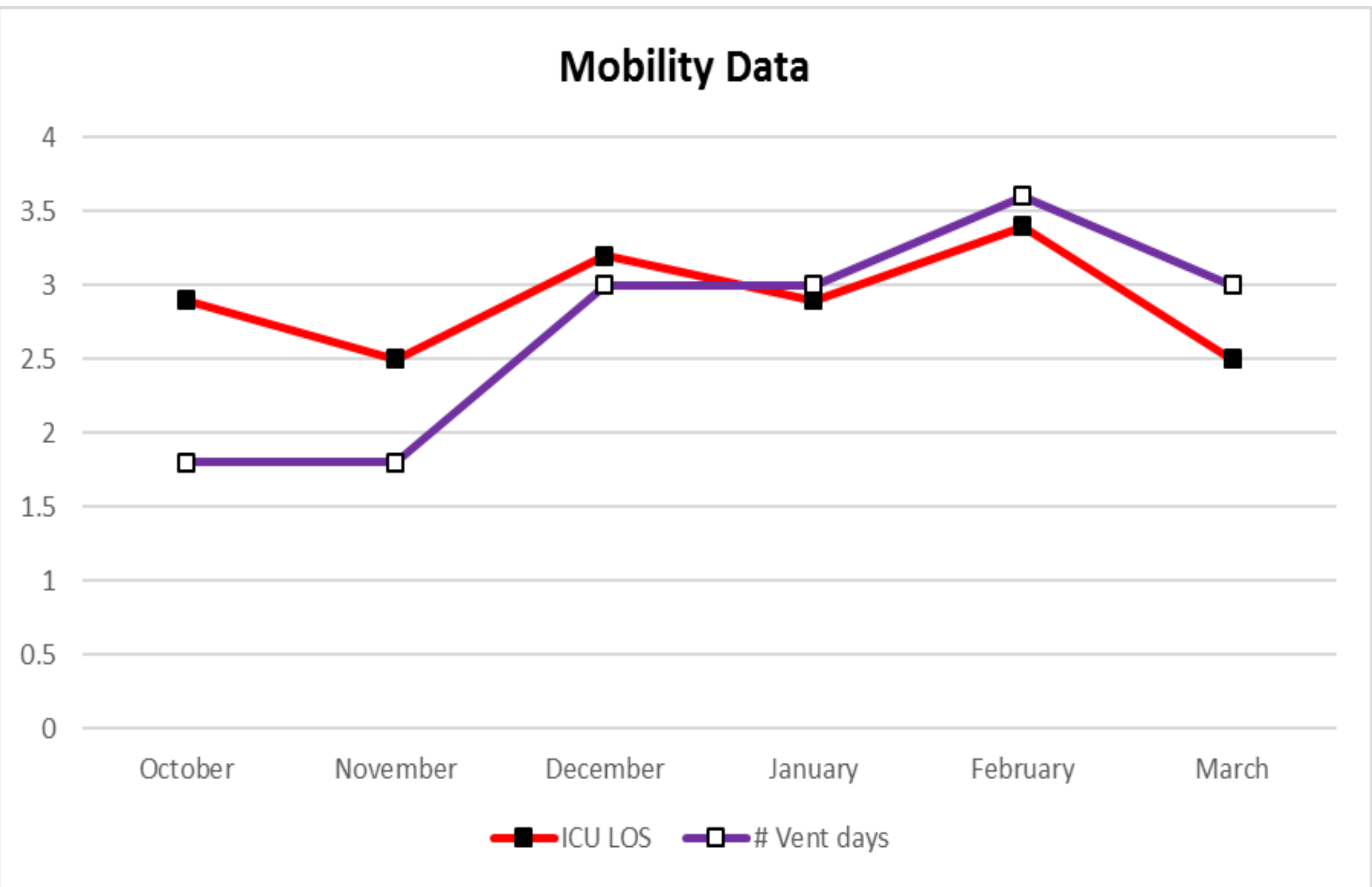
- Develop easy to use early mobility program. The program should be nurse driven and physician approved. Involve Physical therapy and respiratory therapy education on early mobility program.
- The goal of this program is to decrease length of ICU stay by one day. Program began on Oct. 2nd 2017. Compliance will be measured with audit tool, which will include number of days the patient has been in the ICU. Overall trial will last 3-6 months.
- Trial was implemented on Oct. 2nd 2017. Audit tool and early mobility program evaluation, leveling, and activity sheets were placed in a binder on nursing unit. Number of ICU days was recorded on the audit tool along with activities performed with the patient. Audit tool was collected and data analyzed after patient d/c from ICU.
- Audit tool will be used on an ongoing basis during the trial. Data will be analyzed from the audit tool every month to measure progress.

## RESULTS

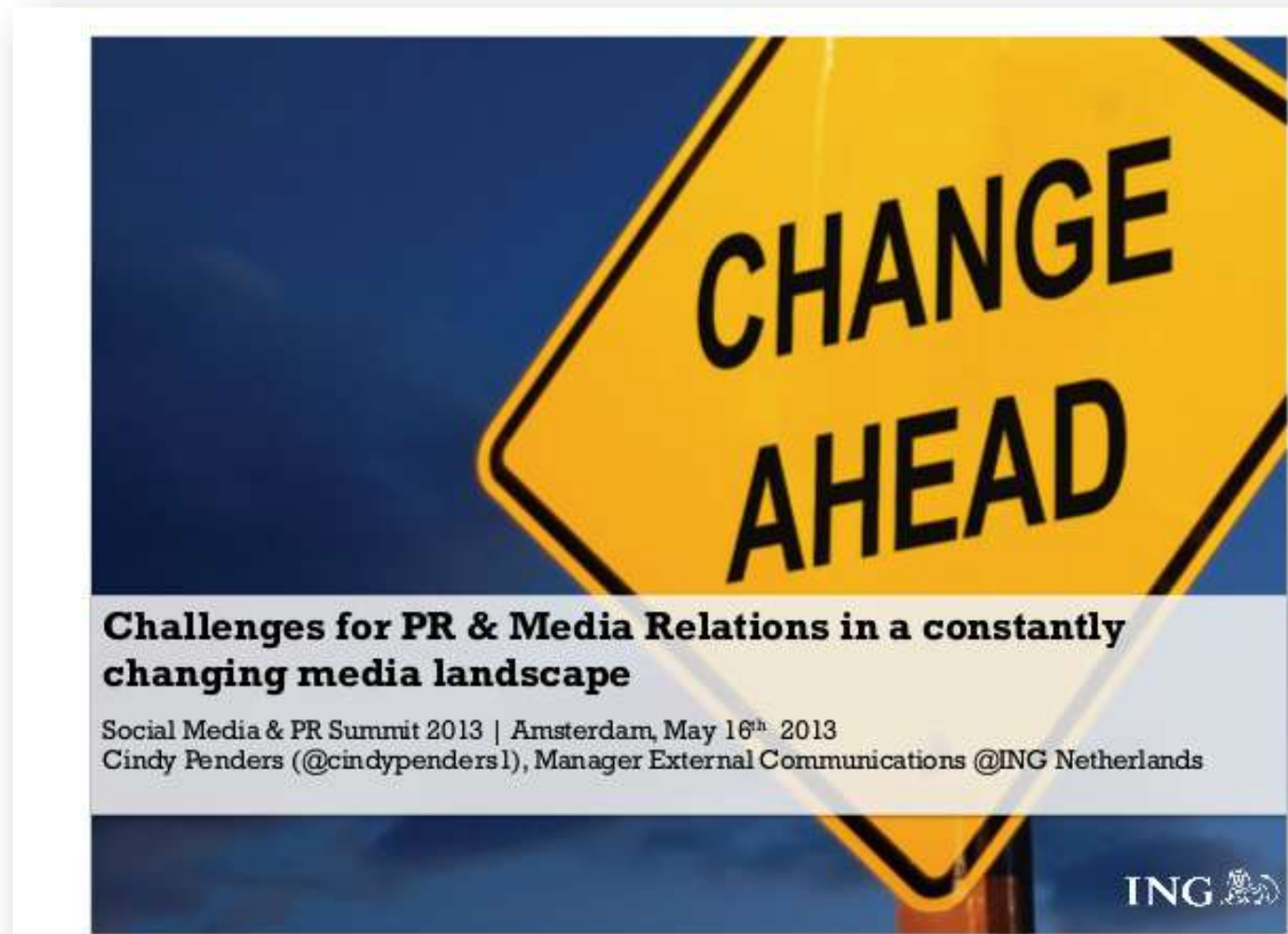
Trial was implemented on Oct 2nd 2017. Goal is a reduction in ICU LOS by 1 day and reduction of vent days by 1 day.

**Pre-implementation of mobility protocol in the previous 6 months, average ICU LOS was 4 days and average number of days on the ventilator was 4 days.**

**This is only a limited amount of data collected over six months. Data will be analyzed every month for the duration of the trial.**



Month	Total # patients	Total # vent patients
October	52	8
November	65	6
December	48	9
January	54	9
February	42	12
March	36	7



## Lessons Learned

- The trial has already shown promise in reducing ICU LOS and number of ventilator days in our facility.
- There are limitations to the study, including a limited number of ventilator patients and patients that remain on the ventilator but are comfort care pending life support withdrawal.
- We also face the limitation of physicians ordering continuous sedation infusions rather than prn bolus medications. This practice can lead to over sedation of ventilator patients which makes them difficult to mobilize.
- The limited amount of time the data has been collected is also a limitation.
- The following are also nursing barriers identified:
  - Over use of restraints
  - Forgetting to fill out audit tool
  - Not charting activities in patient's EMR

The trial will be for a total of 6 months. All the data was then analyzed to see if our mobility program has made an impact on ICU LOS and number of ventilator days. Per the data, ICU LOS and Vent days were reduced an average of 1 day during the trial.





## Safe Mobilization in Critical Care

Early mobilization and rehabilitation may positively impact the recovery of patients supported with ECLS. Safety concerns arise when children are cannulated directly to their great vessels through their mediastinum or other sites.



Figure 1: **TIME-OUT** by PT, ECLS Specialist, RN, MD to review **Patient and Equipment**.



Figure 2: **TIME-OUT** by team to establish **Roles and Responsibilities** for Mobilization



Figure 3: Patient and Devices secured in wheelchair



Figure 4: After mobilization, patient can be deemed **safe** for in-chair **activity**, or in-chair transport **out of room**

Figure 5: **TIME-OUT** process utilized to promote safe **standing** and **ambulation**.



## TIME-OUT

**TIME-OUT** is defined as the full verification performed immediately prior to the start of a procedure and is the final safety stop before a procedure is started. We report the implementation of a time-out strategy to address inter-professional coordination and to maximize safety during these maneuvers.

Table 1: Time-Out procedure for mobilization of the child with iLA device cannulated in mediastinal configuration.

Action Item	Process	Team Member
Section 1: Pre-Time-Out, Preparation of the equipment		
1. Mobilization Cart Set-up	IV pumps, blood flow monitor with backup battery, & power bar	Physiotherapist & ECLS Specialist
	2 Oxygen tanks: one for patient and a second for iLA O <sub>2</sub>	
	Portable suction with catheters	
	4 Cannula clamps	
	ECG and SpO <sub>2</sub> monitor clamped to cart	
2. Wheelchair Set-up	Clamps at the base to attach cart to the wheelchair	Physiotherapist & ECLS Specialist
	Membrane leveler on articulating arm	
	Pressure relieving cushion	
Section 2: Preparation of the Child		
1. Pre-medication	Opioid bolus 20 min prior to mobilization	Bedside RN
2. Toileting	Ensure child has toileted in the half-hour before mobilization	Bedside RN
Section 3: Time-Out		
1. Anticoagulation review	Heparin infusion dose/rate and infusion pump location	Bedside RN & ECLS Specialist
2. iLA device review	O <sub>2</sub> flow meter is connected and working	Bedside RN & ECLS Specialist
	Blood flow confirmed to be in target range	
3. Assess child readiness	Hemodynamics, respiratory status & behavioral readiness	Bedside RN & ECLS Specialist
4. Review each Team Members roles and responsibilities	ECLS Specialist de-aids and purges membrane and holds membrane during transfer	4 team members
	Physiotherapist transfers child communicating directly with him/her	
	Bedside RN stands behind Physiotherapist to ensure no tangling of equipment	
	Physician present to oversee the process	
Section 4: Mobilization Process		
1. Transfer from bed to wheelchair	Mobilization cart is placed at the foot of the bed facing the wheelchair	4 team members
	Wheelchair is placed at head of bed facing the child	
	Child dangles at edge of bed with ECLS specialist managing membrane	
	Physiotherapist cradles the child to lift into the wheelchair	
2. Secure patient and devices in wheelchair	iLA is placed and leveled in the iLA leveler	Physiotherapist & ECLS Specialist
	iLA O <sub>2</sub> gas flow source is transferred from wall to O <sub>2</sub> tank green tubing	
	Mobilization cart and wheelchair are clamped together and secured with secondary straps	
	Tray for footrest placed	

## Methods

Case report of the implementation of a team **TIME-OUT** strategy with a child cannulated via mediastinum for support with an Interventional Lung Assist (iLA) membrane ventilator.

## Results

- A school aged child with right ventricular and respiratory failure necessitating ECLS as a bridge to lung transplantation with for a duration of 4 months.
- Acute rehabilitation included:
  - 1- mobilization in-and out-of-bed
  - 2- both with pre-gait and gait activities,
  - 3- school,
  - 4- child life and music activities.

After implementing this TIME-OUT procedure, adverse events did not recur.

## Conclusions

- The utilization of TIME-OUT procedure prior to each rehabilitation activity may:
  - 1- improve the safety of rehabilitation care plans when mobilizing patients cannulated on ECLS
  - 2- improve the integration of rehabilitation activities with critical care activities
  - 3- improve patient outcomes and sense of self-control.

## Acknowledgements

Thank you to all that supported the care of this patient. Clinical and Management Staff of the Paediatric Intensive Care Unit, Hospital for Sick Children, Toronto, Canada.



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# Exploration of healthcare professionals experiences following the implementation of electronic patient diaries into ICU

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## Introduction

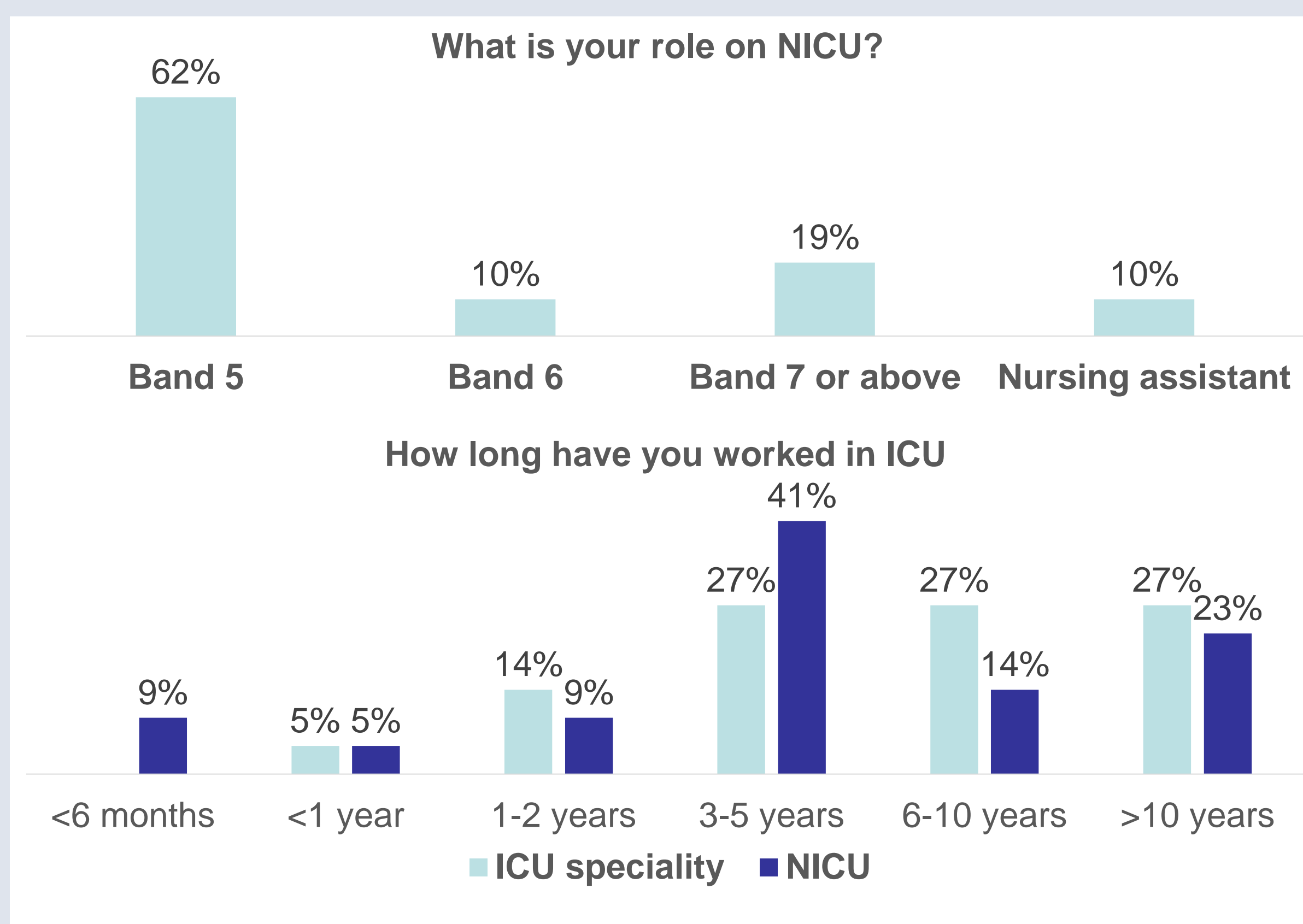
Patient diaries have been used in critical care for a number of years. We have recently developed and introduced an electronic patient diary 'e-diary' into our neuro intensive care unit (NICU).

This survey was conducted to explore the staff experiences following the introduction of the e-diary.

## Methods

All staff (~170) on the NICU were asked to complete an anonymous survey following the implementation of electronic patient diaries into NICU.

A JISC Online Survey link was sent out via email, whilst printed copies were also made available. Staff were asked 13 questions which included open ended and basic staff demographics.



## Results

Twenty three staff completed the survey of which 90% of respondents were nurses of varying grades, with nursing assistants representing 10%. Their work experience ranged from less than 6 months to more than 10 years. All but two had used the e-diaries, with varying success.

*"Easy to do and invaluable for patient's."*

*"Difficult to manage when you are busy"*

Staff were asked what they perceived the benefits and disadvantages would be for patients and/or families from receiving a diary written for them during their stay.

*"...an explanation of the time they don't remember..."*

*"... brings the experience back, may be distressing."*

## Results (cont).

Writing in the diaries had benefit for the staff themselves.

*"...can be cathartic for staff and allows them to nicely summarise that care they have provided the patient."*

Although staff liked the convenience of the e-diary, they still faced barriers to writing diary entries.

*"Time consuming above all when a patient is very sick and you don't have enough time..."*

The content that staff wrote in the diaries varied, such as writing about sitting out in the chair, the daily visitors but they did not include medical jargon or negative events.

*"I update them on what they had done in the day, congratulate them on what they've achieved."*

The overwhelming majority thought the diary was important but didn't see it as a priority, whilst only one reflected on the impact, of not writing in the diary, might have on a patient.

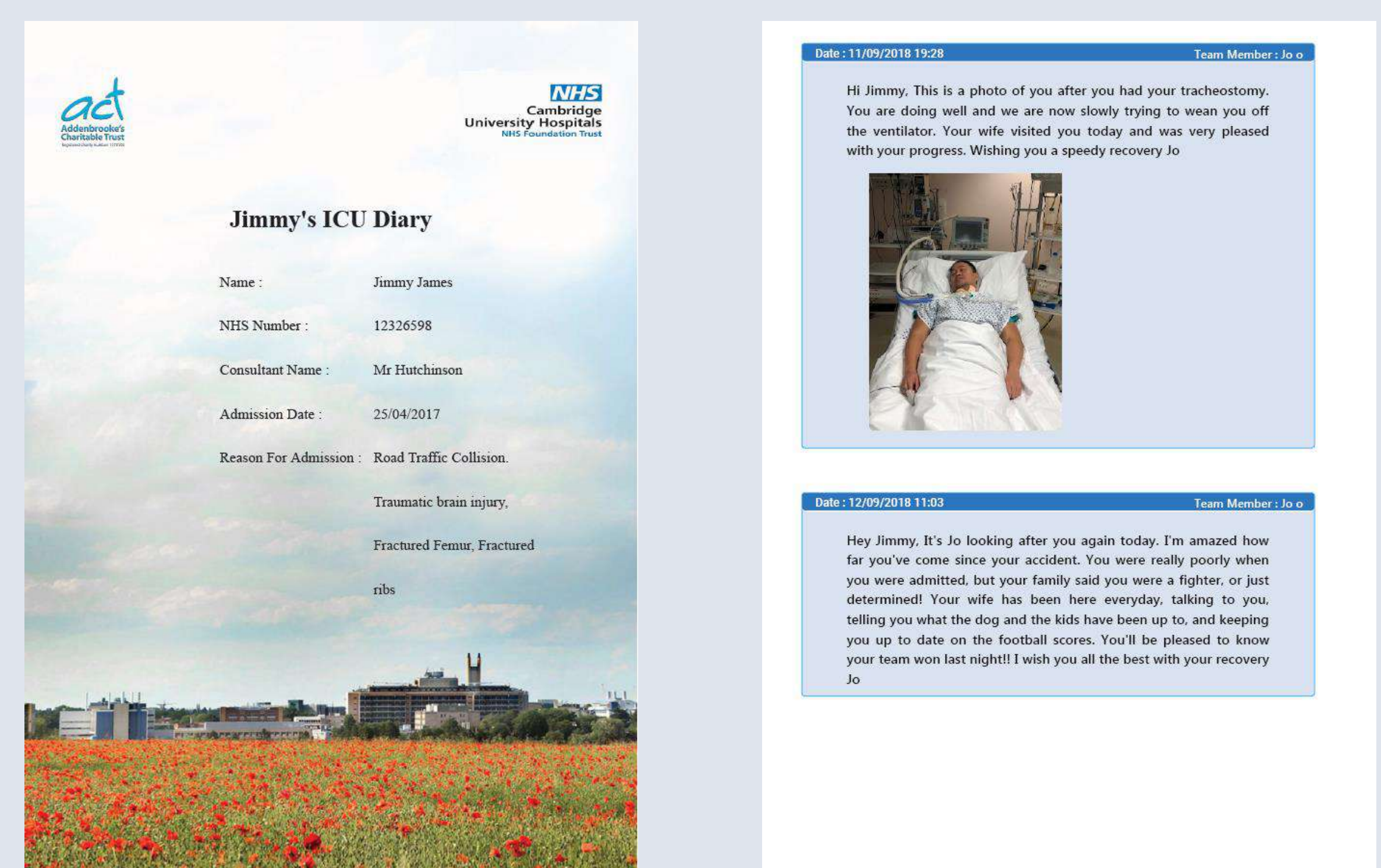
*"...I forget to do it even though I understand the importance of a diary."*

## Conclusion

Staff have embraced the introduction of the e-diaries and have recommended improvements.

Despite it being online, nurses still find barriers to completing the diary. A shift in focus is required to ensure writing in the patient's diary is seen as an essential part of the patients journey.

Further education and research is needed to refine the use of e-diaries, integrating them further into normal clinical care.



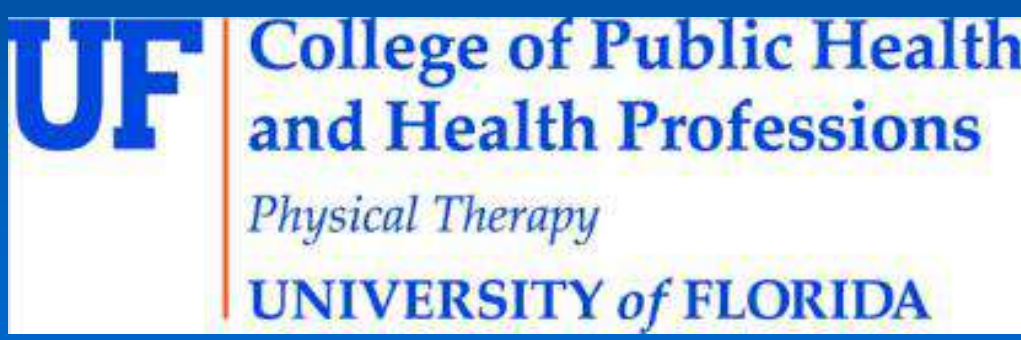
Example of pages of printed patient e-diary



# Mobility Progression of a Critically Ill Pediatric Patient with ECMO as a bridge to recovery



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UF Health Shands Children's Hospital



## BACKGROUND AND PURPOSE

- It is well documented and supported that critical illness causes substantial neuromuscular weakness and impaired functional mobility. In this patient population, physical therapy intervention has been deemed safe and effective[1].
- Until recently, bed rest has been the standard of care of pediatric patients supported by on extracorporeal membrane oxygenation (ECMO) although research has demonstrated that mobility in adults supported by VV ECMO is safe and effective at improving outcomes[2 ].
- Currently there are few case reports documenting the safety and feasibility of mobilizing pediatric patients on ECMO support.
- Recent studies suggest improved functional outcomes and decreased mortality in patients who are awake and able to participate in therapy while supported by ECMO as a bridge to either transplant or recovery [3].
- With the increased use of ECMO to support pediatric patient's to both recovery or transplantation, safe and feasible means of mobilizing patient's need to be determined. [1]
- At the time of this case, our facility was only mobilizing adult patients on ECMO support while the pediatric patients remained sedated and on bed rests without active therapy orders.
- The purpose of this case report is to describe the physical therapy management of and mobility progression in a 13 year old female with severe ARDS, placed (ECMO) with mechanical ventilation as a bridge to recovery.

## CASE DESCRIPTION

- The patient was admitted on February 23, 2017 with acute respiratory failure due to influenza A&B.
- The patient was a 13 y.o female who, prior to admission, was a high level youth athlete who participated in daily aerobic and strength training. The patient had been noted to compete in competitive sports 48 hrs prior to admission
- The patient was intubated prior to arrival, upon arrival was placed on inhaled nitric oxide and had chest tube placement for right side pleural effusion
- Due to continued difficulty with ventilation, the patient was transitioned to the oscillatory on February 25, 2017 with no improvement
- On February 25, 2017 the patient was cannulated veno-arterial (VA) with bi-femoral cannulation, transitioned to veno-arterial-venous (VAV ECMO) on February 26, 2017 , she was later emergently transitioned to veno-venous (VV) ECMO with femoral and internal jugular cannulation on February 28, 2017 due to a failed femoral arterial cannula
- Ultimately the patient progressed to VV ECMO with single-site bicaval dual-lumen (BCDL) catheter (Avalon Laboratories, Rancho Dominguez, CA, USA) with tracheostomy placement on ECMO day 38. She remained on ECMO for 68 days total as a bridge to recovery.
- The patient's mobility was assessed utilizing the ICU mobility scale (IMS) [4]. While on EMCO the patient was progressed from bed level therapy, bed mobility, sit to stand, and gait training. Therapy was held on several occasions due to significant medical complications related to ECMO.

## RESULTS

Date	Mobility Level
3/7/2018	Bed Level PT and OT initiated
4/6/2017	Sitting edge of bed (EOB) with moderate assist
4/11/2017	Sit to stand with max assist of 4 persons
4/15/2017	Sit to stand with mod assist of 2 persons
4/19/2017	Gait training initiated with glovo body weight support system
4/27/2017	Treadmill training initiated with LiteGait bodyweight support system
5/21/2017	Gait training without bodyweight support system with moderate assist
6/13/2018	Independently ambulating with rolling walker
7/20/2018	Independently ambulatory without assistive device. 6 min walk test performed: 612 ft
8/30/2017	daily pulmonary gym program initiated

Table 1. Patient's mobility progression by date. Progression noting assistive and support devices utilized.

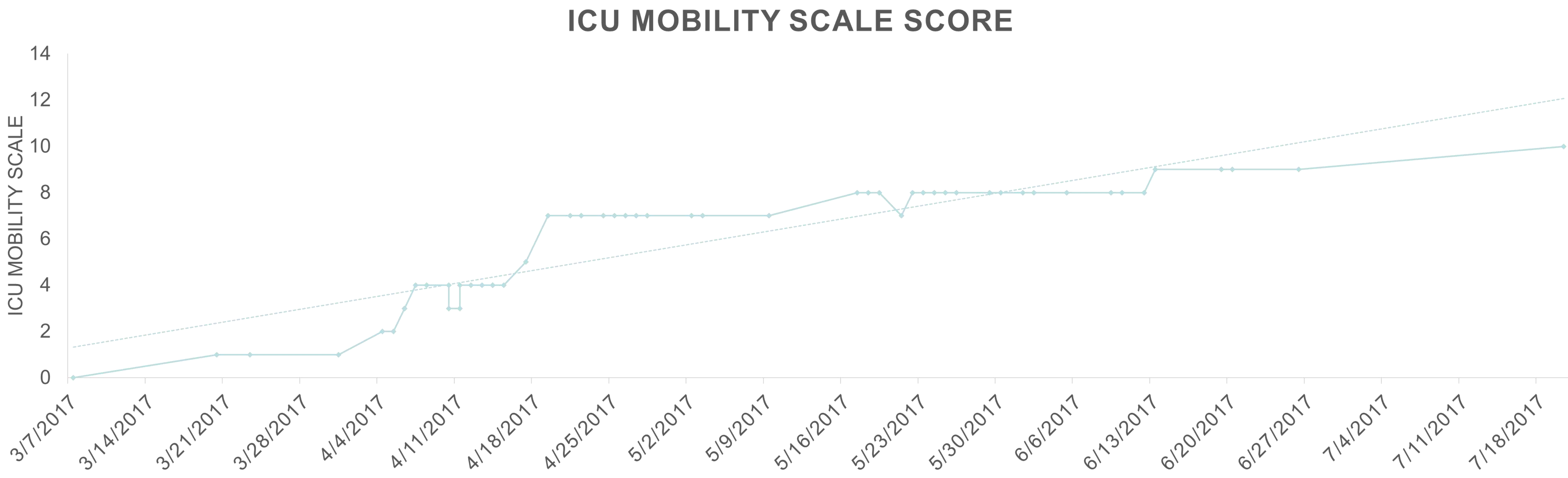


Figure 1. IMS score from initiation of therapy (ECMO day 10 March 7, 2017) to hospital discharge on October 10, 2017.

- Active PT and OT was initiated on ECMO day 10. This therapy program include bed level therex and active-assisted ROM. The patient's initial MMT strength was 1/5 globally.
- Patient was placed on hold on ECMO day 12 due to hemothorax requiring thoracotomy and evacuation. She required a second thoracotomy on ECMO day 14.
- Therapy was reinitiated on ECMO day 23 and continued to consist of bed level strengthening activities. At this time the patient remained cannulated with VV ECMO via femoral and internal jugular veins. While femorally cannulated, she achieved a max IMS of 1/10.
- On ECMO day 38 (April 3, 2018) the patient was converted to VV cannulation via bicaval dual-lumen catheter with tracheostomy placement. At this time, bed mobility to sitting edge of bed and standing activities were progressed. She achieved a max IMS score of 8/10. Please reference the table below for more detailed mobility progression.
- The patient was decannulated on ECMO day 68 (May 4, 2017) however remained on significant ventilator support via tracheostomy
- On May 19, 2017, the patient experienced severe dehiscence of her right thoracotomy wound with loss of volumes on the ventilator. At that time she was noted to have several brochopleural fistulas for which 3 endobronchial valves were placed. At this time the patient was again placed on hold for therapy intervention.
- Therapy was reinitiated on May 21, 2017 and patient was able to consistently progress with mobility and strength. She was seen on a daily basis by both PT and OT (one service in the morning and one in the afternoon). She also participated on a seated or bed level in room therapeutic exercise program.
- The patient was discharged independently ambulating without an assistive device on aerosolized trach collar of 8 liters oxygen at 30%. She achieved an IMS score of 10/10 and was able to ambulate 612 ft on a 6 minute walk test. She was ambulating short community distances. She was progressed to an outpatient therapy program with our pulmonary team.

## DISCUSSION

- Physical therapy interventions to include therapeutic exercise, bed mobility, transfers, and gait training were safely performed with a critically ill pediatric patient on ECMO support. No adverse events occurred during physical therapy intervention. Adverse events include but are not limited to significant bleeding, ischemic events, ECMO malfunction and malpositioning of cannulas.
- The IMS was utilized as an outcome measure in this case as the goal was to document the mobility progression of the patient as well as to identify the benefits of mobility in a pediatric patient while on ECMO support. This scale allowed a quick and simple means of scoring mobility in a critically ill patient. The IMS is noted to be sensitive to subtle mobility changes in ICU level patients. Increasing IMS scores also correlate with increased 90 day post-discharge survival rates. [4]
- The findings of this case report are limited to a single patient in the pediatric intensive care unit on VV ECMO support who was mobilized daily as medical stability allowed. Regardless of the scale utilized to monitor progress, the patient demonstrated improvements in functional mobility and was able to bridge to recovery and ultimately discharge home.
- It is difficult to determine base on this case if the results could be generalized to other pediatric patients with more limited mobility prior to admission as the patient in this case was a very active athlete prior to admission.

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# ICU Delirium Documentation in the EHR- A Medical Student QI Project

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## Abstract

Delirium is an acute neuropsychological response to severe illness, characterized by alterations in cognitive functions and attention that fluctuate over time. Delirium is associated with a host of negative consequences for the patient.

The aim of this quality improvement project was to attain a >90% rate of documentation of ICU delirium in the EHR problem list for CAM-ICU positive ICU patients. Baseline documentation rate data was collected. Focus interviews regarding barriers to delirium documentation were conducted and used to design an intervention. The intervention was delivered for four weeks. Pre-intervention, intervention, and post-intervention delirium documentation rates were measured. We improved from 3.2% pre-intervention to a maximum documentation rate of 51.9% post intervention.

While not reaching the goal of >90%, the quality improvement project was able to achieve a 15-fold increase in the ICU delirium diagnosis documentation rate in the EHR. Ultimately, this increase in documentation leads to improved visibility of a delirium diagnosis while in the ICU, on transfer to the floor, and following discharge. Improved documentation of ICU delirium is the first step toward addressing the post ICU discharge care needs of those who suffer from ICU delirium.

## Introduction

Delirium occurs in 40-50% of our institution's adult medical-surgical ICU patients, but is not routinely documented in the EHR. Patients with ICU delirium are at increased risk for prolonged ICU and hospital stays, prolonged ventilator need, failed extubation attempts, unplanned removal of medical devices, increased risk of death, and increased risk of prolonged neurocognitive dysfunctions.<sup>1,2</sup> Appropriate documentation is necessary in order to optimize the delivery of health care to delirious patients while in the ICU and after discharge from the ICU and the hospital.

Geisinger's Undergraduate Medical Education office and the Geisinger Simulation and Medical Education center run an interprofessional QI course annually, attended by third year campus medical students, nursing students, and post doctoral pharmacy students. The fall semester is spent in didactic sessions, and the spring semester is spent executing a QI project. The projects are presented to the entire group at the end of the spring.

## Methods and materials

We conducted a short cycle QI project from January 1, 2017 through April 30, 2017. We began by measuring our baseline ICU delirium documentation rate. We examined the EPIC charts of all CAM-ICU + patients in our 24 bed adult medical-surgical ICU from January 1, 2016, through April 30, 2016. The CAM-ICU + data was retrieved from our ICU dashboard, delirium section. Charts that had delirium documented on the problem list and/or addressed in the care plan section of any daily progress note were counted as having adequate documentation of ICU delirium.

The QI team then conducted interviews of the two ICU teams caring for the medical-surgical ICU patients to query their opinion as to the causes for the low rate of ICU delirium documentation, as well as their ideas for how to improve the documentation rate. Using the information from these interviews, an intervention was designed.

Our intervention consisted of a daily review by the QI team of the CAM-ICU status of each patient admitted to our adult medical-surgical beds. For all CAM-ICU + patients, the QI team presented the rate of documentation of delirium in the problem list for the previous 24 hours to the ICU attending and fellow. In addition, one page long information sheets regarding the outcomes associated with ICU delirium were developed, discussed with the ICU team members, and left at the computer work stations from March 1, 2017 through March 31, 2017.

On April 1, 2017, the information sheets were removed from the computer work stations, and the QI team stopped its daily interactions with the ICU teams. We collected delirium documentation rates for the active intervention period from March 1, 2017 through March 31, 2017. We also collected delirium documentation rates in the post intervention period, from April 1, 2017 through April 8, 2017.

## Results

PRE-INTERVENTION	3.2%
INTERVENTION	45.9%
POST-INTERVENTION	51.9%

## Discussion

While not reaching the goal of >90%, the quality improvement project was able to achieve a 15-fold increase in the ICU delirium diagnosis documentation rate in the EMR. Ultimately, this increase in documentation leads to improved visibility of a delirium diagnosis while in the ICU, on transfer to the floor, and following discharge from the ICU and the hospital. Inclusion of the delirium diagnosis in the problem list of the EHR is the first step toward addressing the care needs of those who suffer from ICU delirium both while they are in the ICU and once they leave the ICU and the hospital.

## Conclusion

With increasing recognition of the long term negative effects of ICU delirium on physical, behavioral and cognitive health as well as survival, it is critical that delirium be documented in the EHR so that all members of a patient's care team, both inpatient and outpatient, will be aware of this critical complication of acute illness. Future interventions should target improving documentation rates of ICU delirium as the first step in improving care and support services following ICU and hospital discharge. In addition, the intervention utilized in this project may be generalizable to other units experiencing deficient documentation of delirium.

## References

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# PROFESSIONAL ADVICE ABOUT AVOIDING SEDENTARY BEHAVIOR DURING HOSPITALIZATION ON THE LEVEL OF PHYSICAL ACTIVITY, MOBILITY AND MUSCLE STRENGTH IN OLDER ADULTS: RANDOMIZED CONTROLLED TRIAL

Ivens Willians Silva Giacomassi<sup>1</sup>; Nayara Alexia Moreno<sup>2</sup>; Bruno Garcia de Aquino<sup>2</sup>; Isabel Fialho Fontenele Garcia<sup>2</sup>; Lucas Spadoni Tavares<sup>2</sup>; Adriana Claudia Lunardi<sup>2,3</sup>.

<sup>1</sup> Institute of Medical Assistance to the State Public Servant, Physical Therapy Service, <sup>2</sup> University City of São Paulo, São Paulo, Brazil, <sup>3</sup> Department of Physical Therapy, School of Medicine, University of Sao Paulo.

## BACKGROUND & PURPOSE

Hospitalization leads to long periods of rest and physical inactivity, with consequent generalized muscular weakness and impairment on independence and functionality<sup>1</sup>.

Therefore, preventing inactivity during hospitalization can be a way to prevent loss of older patients' independence<sup>2</sup>. Mobilization has been increasingly announced as an important part of physical therapy for hospitalized patients, however many of them still spend most of their time in bed<sup>3</sup>.

**Aim: To assess the effect of advice about the importance to keep actives during hospitalization on the level of physical activity, mobilization, muscular strength, hospitalization time and complications rate of older patients.**

## METHODS:

**Study Design:** randomized controlled trial with blind assessment.

**Subjects:** 68 older patients (>60 yrs)<sup>4</sup> were admitted to wards of a university hospital due clinical causes. The intervention group (IG, n=33) received a booklet with content about the deleterious effects of hospitalization and the importance of staying active during hospitalization. The control group (CG, n=35) received the usual hospital care only.

## Measurements:

▪ **Physical Activity Level:** assessed via an accelerometer (ActiGraph GT3X, ActiGraph Corp, USA) placed on the wrist of the dominant limb. Accelerometry was performed 24 hours a day, from baseline to hospital discharge.



▪ **Mobility:** assessed via the Morton Mobility Index (DEMMI) at baseline and hospital discharge.

▪ **Muscle Strength:** assessed via a handgrip dynamometer (Smedley, Sahean, Belgium) at baseline and at hospital discharge.

▪ **Time of hospitalization:** the period from admission to the ward until hospital discharge was recorded.

▪ **Incidence of clinical complications:** the incidence of complications was recorded due to the emergence of a new condition requiring treatment, such as pneumonia, Atelectasis with clinical repercussion, severe hypoxemia and deep venous thrombosis. The diagnosis of complications was given by a physician.



YOU GET TIRED OR HAVE DIFFICULTY TO...



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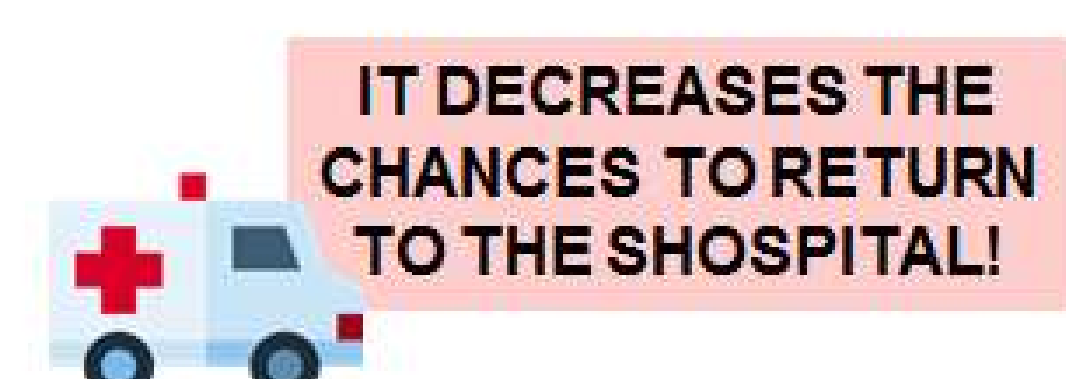
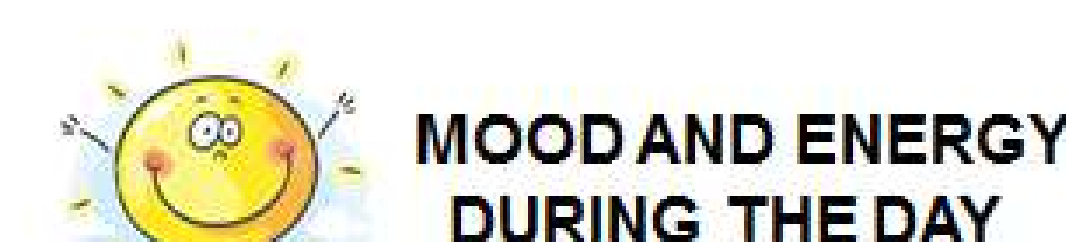
## BOOKLET FOR PATIENT GUIDANCE



**WHY DO I NEED TO MOVE WHEN I'M HOSPITALIZED**



IF YOU MOVE, IT WILL IMPROVE:



YOU FEEL BETTER TO GO BACK HOME!

BEING HOSPITALIZED MAKES THE FATIGUE AND STRENGTH IN THE BODY GET EVEN WORST!

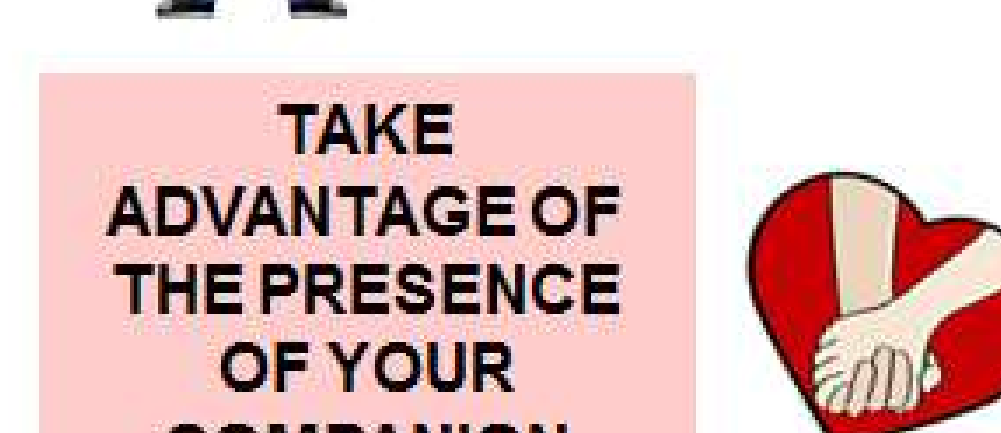
WHY DOES THIS HAPPEN?

- We stay in bed for a long time;
- We move less than at home;
- This decreases muscle strength;

**IMPORTANT!**  
WE HAVE TO MOVE MORE IN THE HOSPITAL



HOW DO I HAVE TO MOVE?



## RESULTS

IG (68±7 yrs, 54% female, 46% pneumonia) had a shorter time in sedentary behavior and walked more daily steps compared to CG (70±7 yrs, 33% female, 42% pneumonia). In addition, fewer older patients from IG lost mobility (6 vs. 30%, p=0.03) during hospitalization compared to CG. There were no difference on muscle strength, hospitalization time and complication rate between groups. Two patients dropped out on CG due death.

Outcomes	Intervention group (n=33)	Control group (n=35)	p
Daily steps	4931.63 ± 2313.79	3959.03 ± 1466.38	0.04
% Time in sedentary behavior	62.29 ± 11.54	68.23 ± 10.97	0.03
% Time in light activity	32.04 ± 11.32	28.51 ± 7.99	0.18
% Time in moderate activity	4.17 ± 2.75	2.97 ± 1.93	0.04
Loss mobility	2 (6%)	10 (30%)	0.03
Loss muscle strength	7 (21%)	14 (40%)	0.15

## Hospitalization time and Incidence of complications

There was no difference in the days of hospitalization (5.75±2.93 vs. 5.34±2.87; p>0.05, respectively) between the IG and CG. There was no record of complications in both groups.

## CONCLUSION

Our results suggest that verbal advice and an illustrated booklet on the benefits of staying active during hospitalization were efficient in increasing the level of physical activity, ultimately reflecting less loss of mobility in older patients hospitalized for clinical reasons.

## REFERENCES

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## Diaries for Patients on Intensive Care Units reduce the Risk for psychological Sequelae in Patients and their Relatives: Systematic Literature Review and Meta-Analysis

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### For fast readers:

Do diaries reduce the risk for PTSD, anxiety or depression in ICU patients and their families?

**Background:** Diaries are written for patients on Intensive Care Units (ICU) by clinicians and relatives to reduce the risk of psychological complications such as Posttraumatic Stress Disorder (PTSD), anxiety and depression. This topic was the focus of a recent Cochrane-Review<sup>1</sup> that only included studies with PTSD diagnoses based on interviews carried out by qualified personnel. The review authors concluded that there would be inadequate evidence to support the thesis that ICU diaries reduce the risk of psychological complications.

### For fast readers:

We replicated a recent Cochrane Review, but used broader inclusion criteria

**Method:** The present study replicated the design of the Cochrane-Review with identical search algorithms, but included additional outcomes data from validated methods of diagnosing psychological complications that were not considered in the original Cochrane Review. Databases were Cochrane Central Register of Controlled Trials, Medline, CINAHL, PsychInfo, Published International Literature on Traumatic Stress (PILOTS) data-base, Web of Science Conference Proceedings Citation Index, Clinical Trials and others. Studies were included if diagnostic interviews or validated questionnaires were used to proof diagnosis of PTSD, anxiety and depression in randomized, controlled trials, quasi experimental or controlled clinical trials. Excluded were a) reviews or protocols, b) when data could not be extracted, c) design was a cohort or cross-over study, or d) other reasons. The primary outcome was PTSD in patients or relatives for whom ICU diaries were written. Secondary outcome were anxiety and/or depression symptoms. Study quality was evaluated using the Cochrane risk of bias assessment. The study is registered at Prospero (CRD42018090263).

### For fast readers:

Replicated search included 6 studies, 605 patients, 145 relatives. Quality rating of studies was low to good.

**Results:** The replicated search produced 3179 citations, of which there were 6 eligible studies from which 605 patients and 145 relatives could be included in the meta-analysis<sup>2-7</sup>. Studies ratings ranged from low to good. We found protocols of another 6 ongoing studies with PTSD in patients as primary outcome.

### For fast readers:

Meta-Analysis showed in patients: a non-sign. reduction of PTSD, and a sign. reduction in anxiety & depression; in families a sign. reduction in PTSD

The meta-analyses of the PTSD outcome demonstrated: (a) for ICU patients (4 studies, n=569 patients) a non-significant reduction (OR 0.58, 95%CI: 0.24-1.42, p=0.23), and (b) for relatives' PTSD (2 studies, n=145 relatives) a significant reduction (OR 0.17, 95%CI: 0.08-0.38, p<0.0001) in favour of ICU diaries. For anxiety and depression symptoms in ICU patients (2 studies each, n=88 patients) there was a significant reduction (OR 0.23, 95%CI: 0.07-0.77, p=0.02; OR 0.27, 95%CI: 0.09-0.77, p=0.01, respectively) (Fig. 1-4). The heterogeneity was between 0% and 54%.

Fig. 1 Diaries vs. no diaries and PTSD in patients

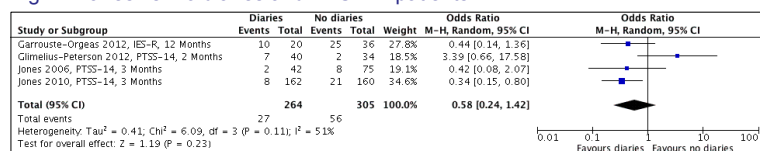


Fig. 2 Diaries vs. no diaries and PTSD in relatives

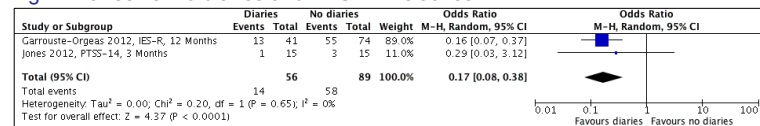


Fig. 3 Diaries vs. no diaries and Anxiety in patients

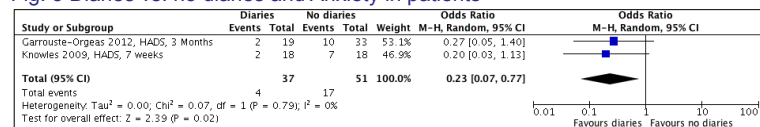
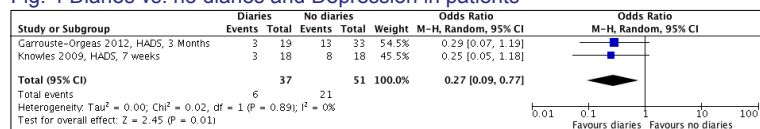


Fig. 4 Diaries vs. no diaries and Depression in patients



### For fast readers:

Diaries reduce anxiety & depression in ICU patients, and PTSD in families; PTSD in patients remains unclear.

### Conclusions:

ICU diaries may reduce the risk of psychological complications in patients and relatives after ICU stay<sup>8</sup>.

**Literature**  
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Meta-Analysis  
Fulltext (in German)



Website  
ICU diaries



**Contact**  
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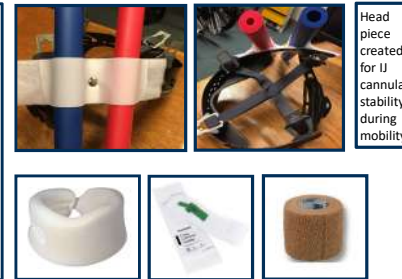


## Objective

The purpose of the project was to develop a femoral ECMO mobility protocol with input from a multi-disciplinary team including lung transplant pulmonologists, thoracic cardiovascular surgeons, critical care nurses, ECMO specialists, and PTs/OTs. The project was centered on the initiation and progression of mobility of patients with at least one femoral ECMO cannula with activity ranging from AROM in bed to edge of bed and standing.

## Mobility Results

From July 2016 to July 2017, 10 patients with VV ECMO via dual lumen catheter were mobilized. The scores on the JH-HLM ranged from 2-8. From August 2017 to March 2018, 14 patients with VV ECMO were mobilized (9 patients with a dual lumen catheter and 5 patients with internal jugular/femoral cannulas). The scores on the JH-HLM ranged from 2-8 for patients with a dual lumen catheter and 2-5 for patients with internal jugular/femoral cannulas. The highest level of mobility for a patient with a single femoral ECMO cannula included bed mobility and edge of bed/standing activity. No significant adverse events were noted.



## Conclusion

Research suggests that skilled physical therapy interventions conducted on patients with ECMO may help prevent critical illness myopathy, minimize the need for prolonged ECMO, and improve overall quality of life and physical condition. With evidence based research and collaboration, the first patient with a single femoral ECMO cannula was safely mobilized at our institution. The goal is to continue to research, define and integrate the considerations for mobility, and develop a standardized pre-screening tool and multi-disciplinary mobility protocol for ambulatory femoral VV ECMO.

## Methods

Data was collected from review of the physical therapy patient caseload from June 2016 to March 2018. Patients on veno-venous ECMO (VV ECMO) were organized based on cannulation (dual lumen internal jugular catheter vs. internal jugular/femoral cannulas). The highest level of mobility achieved while on ECMO was documented, based on the JH-HLM. Any adverse events that occurred during mobility were noted. For the purpose of this project, the pre-screening tool developed by Wells et al. was used (with permission) to assess a patient's appropriateness for mobility.

## Considerations for Mobility

Prior to mobilizing the first patient with at least one femoral ECMO cannula, extensive evidence based research was conducted to determine the safety and efficacy. The screening tool developed by Wells et al. was utilized with permission as a guideline for mobility. Below are several questions to consider in preparation for patient mobility as well as the development of a valid screening tool.

- What hemodynamic stability parameters are utilized and how are they defined by the intensivist? What are the ECMO flow/sweep parameters appropriate for mobility? What are the limits for SVO2 during EOB, OOB mobility and ambulation over ground/treadmill?
- What is the evidence based research guiding the parameters?
- Does the ECMO specialist increase the flow prior to mobility for optimal performance?
- Most patients within the ICU on VV ECMO are on anticoagulation with some bleeding around the cannulation sites from movement. How is the bleeding addressed?
- How are the cannulas secured? Is a headpiece used to stabilize the internal jugular cannula? Are sutures (how many) or an elastic band/Coban/foley anchor used to stabilize the femoral cannula?
- Is there a valid and reliable screening tool available for use?
- How many members of the interdisciplinary staff are included in the core group?
- How many ECMO patients are on the rehab caseload on any given work day?
- Is there a rehab competency for therapists to pass prior to mobilizing ECMO patients?
- Do the same therapists treat the ECMO patients to minimize interrater bias with a screening tool?
- Is the pre-screening completed at initial assessment or every treatment session?
- How is patient mobility divided between the rehab team? Do OTs separately mobilize ECMO patients in a similar fashion or are they working in collaboration with PTs for OOB mobility?
- Are treadmills utilized in the ICU for efficiency and safety with line management?
- What is the frequency of the treatment sessions? Are the patients treated once a day or BID? What is the duration and time frame of each session? What staff members are essential for mobility? Is an MD readily available?
- What is the average length of time patients are on VV ECMO as either a bridge or recovery or a bridge to transplant? Are the patients mechanically ventilated via ETT or tracheostomy?
- What are the mobility precautions post ECMO decannulation?

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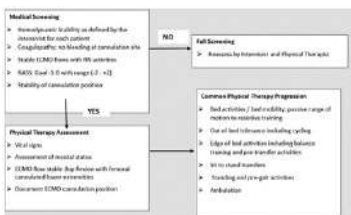
## Acknowledgments

Special thanks to the staff of the cardiac and thoracic ICU, including the thoracic cardiovascular surgeons, pulmonary/lung transplant team, nurses, ECMO specialists, respiratory therapists, and fellow PT/OT staff members who assisted diligently with every treatment session.

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

Activity	Score
250+ Feet	8
25+ Feet	7
10+ Steps	6
1-10 Steps	5
Transfer to chair	4
Sit at edge of bed	3
Turn self/bed activity*	2
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. Used with permission from JH.



**Figure 1.** Physical therapy screening procedures to determine safety to participate in rehabilitation. ECMO = extracorporeal membranous oxygenation, RASS = Richmond Agitation Sedation Scale, RN = registered nurse. Used with permission from Wells et al. Copyright © 2017 by the Society of Critical Care Medicine and Wolters Kluwer Health, Inc. All Rights Reserved.



# Intensive Care staff experience prior to introduction of patient diaries

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## Introduction

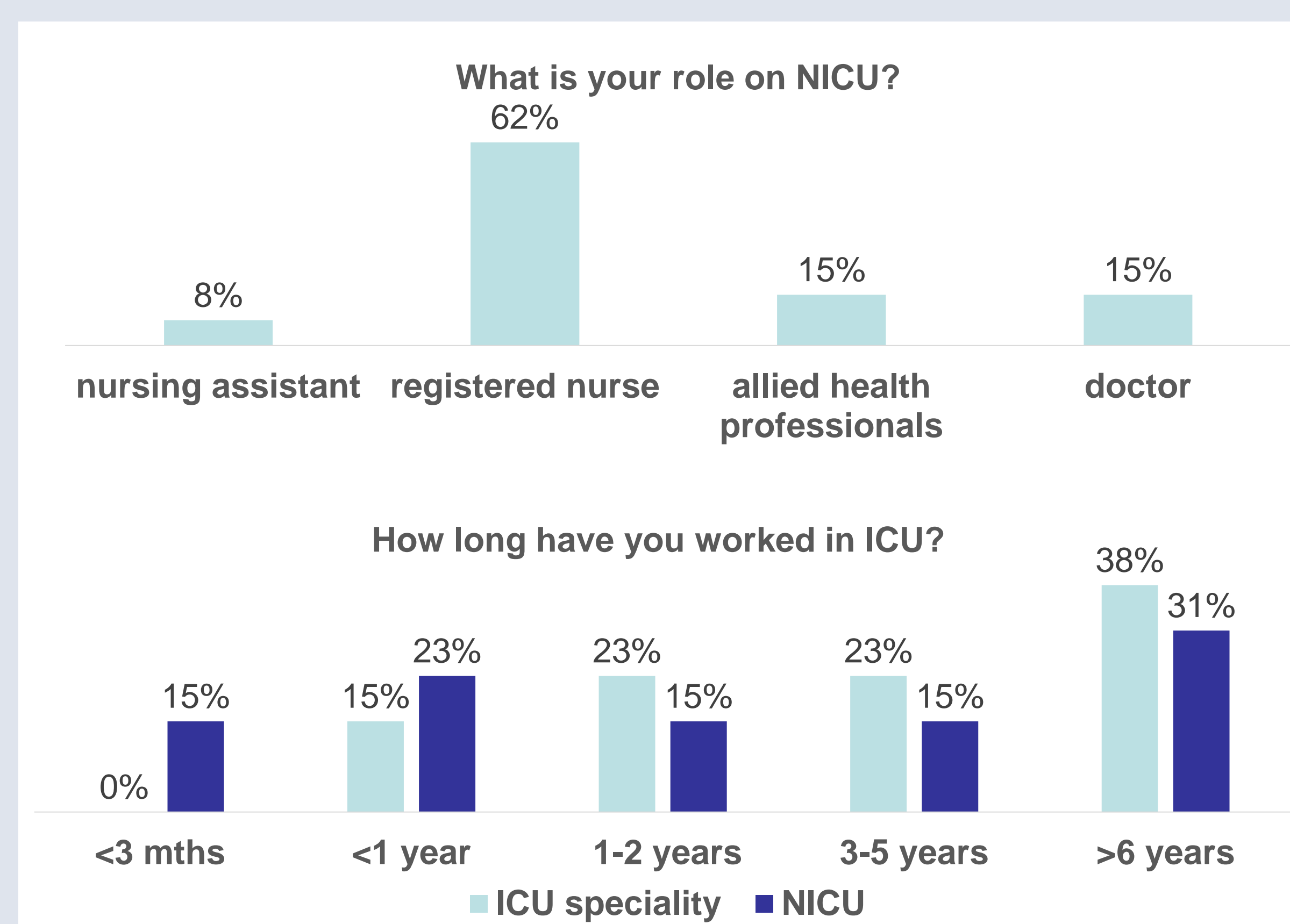
Written patient diaries have been used in our general intensive care unit (ICU) for a number of years.

Prior to implementing diaries into our neuro ICU (NICU), we wanted to explore nurse's experiences of previous use of, and their understanding of patient diaries.

## Methods

All staff (~200) on the NICU were asked to complete an anonymous survey prior to the implementation of patient diaries onto NICU. A SurveyMonkey Inc link was sent out via email, whilst printed copies were also made available.

Staff were asked 10 questions which included open ended and basic staff demographics.



## Results

Despite over 200 staff being asked to complete the survey, only thirteen staff replied.

The majority of staff completing the survey were registered nurses, although nursing assistants, allied health professionals and doctors also completed the survey. Although the majority (38%) hadn't used diaries in another role, 85% felt they had received enough information about the imminent introduction of the diaries into the NICU.

For those who had used diaries in another role, the comments were very positive.

*"For surviving patients they filled the "memory gap" from point of ictus to regaining consciousness."*

## Results (cont).

When asked about what information they'd seen about the implementation of the diaries, there was mixed experiences.

*"Information received through Trust email...[although no]...formal education/information on how, when and who to use it to"*

Staff identified benefits both for patients and their families, but also for themselves.

*"... 'filling in' of the missing hours, days, weeks for the patients... what is important to the individual – football results..."*

A number of 'potential barriers' were identified to being able to complete the diaries, including lack of time, having to handwrite the diaries and knowing what to write.

*"Lack of time, the fact that they need to be handwritten"*

*"Not knowing what to do with it!"*

Staff were asked for their personal opinions about the introduction of the diaries. Some thought they were a great idea but others questioned the lack of evidence supporting their use.

*"I welcome it. Much willing to try it out and include it in the overall care for the patient and their family."*

*"Good idea give it a year and I think it will become part of the daily routine to fill in."*

Some staff felt they needed more training about *"...what we can and can't write in there"*, suggesting a template or guide.

## Conclusion

These findings have been used to influence the introduction of patient diaries into the NICU. The staff identified how time consuming hand writing the diaries would be and asked whether they could be incorporated into the newly introduced electronic medical records.

Subsequently handwritten paper diaries were introduced for a short time, whilst an electronic patient diary was developed and piloted. We acknowledge that there is a need for more research on patients diaries, regardless of the format.



# Pain relieved - but still struggling

Critically ill patients' experiences of pain and other discomforts during analgosedation

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## INTRODUCTION

An analgosedation protocol was implemented in our university hospital medical and surgical ICU in Norway in 2014. Main features were;

- Assessment and documentation of pain, sedation and confusion at least 1x /shift
- Treating pain first and providing sedation only when necessary
- Strong advice for mobilization

## AIM


To explore how ICU patients treated according to a strategy of analgosedation experience pain and other discomforts, and how they handle these experiences after ICU-discharge

## METHOD

- Explorative descriptive design using semi-structured interviews.
- Adult ICU-patients treated in ICU and mechanically ventilated (MV) > 24 h
- 18 patients were interviewed 1-9 days after ICU-discharge. 10 of the patients were re-interviewed after 3 months
- Data analysis using the "Systematic text condensation" - approach

## FINDINGS

The theme "Pain relieved, but still struggling" was abstracted from four main categories emerging from the analysis. Analgosedation provided good pain relief, but the patients described frequent physical and psychological discomforts, in particular related to mechanical ventilation, incomprehension of what was going on and delusional experiences. To handle their ICU-stay, patients needed to participate, to trust in others and to endure suffering. After hospital discharge, experiences from ICU were handled differently. Many patients repressed their experiences, while others needed to talk about and receive recognition of what they had been through. Delusional memories seemed to become internalized experiences over time.




**Struggling to get a grip on reality**

*It was my reality - I was 100% sure of it (that there was a war) just as real as you're sitting there now, so I didn't question it, you see. It was only when I got down here (the ward) that my sister told me what the real situation was - and that I had been dreaming.. so now I have to rearrange it all in my mind*  
(pat 18/ int 1)


**Holding on**

*You just have to work on yourself, and then you manage.. I put myself in to what I call the "hospital bubble", which is necessary to cope - and with that "Positive Mental Attitude", my PMA, I accept that it is something I have to endure*  
(pat 5/ int 2)



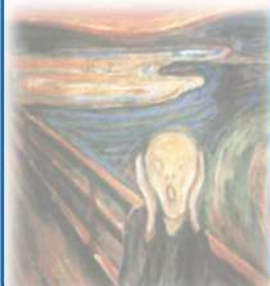
**In discomfort, but rarely in pain**

*I woke up on the ventilator and felt I was choking. I did see people, because my wife was there, and the nurses, and I was trying to speak, but was unable to. I used my hands to try and remove the thing, but they took my hands away.... it was terrifying and I thought, "good grief - are they going to kill me?"* (pat 1/ int 2)



**Handling emotionally trapped experiences**

*In a way I must have disconnected.. I haven't dared to release it, because then I might have ended up in a madhouse*  
(pat 10/ int 2)



## CONCLUSION

Despite good pain relief during analgosedation, critically ill patients still experience ICU-stay as a traumatic part of their illness trajectory

- Attend carefully also to discomforts other than pain
- ICU survivors need to be offered tailored follow-up measures

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Berntzen, H. Wøien, H. Bjørk, I.T. Pain relieved, but still struggling - Critically ill patients experiences of pain and other discomforts during analgosedation. Journal of Clinical Nursing, 2017 DOI: 10.1111/jocn.13920  
All illustrations downloaded from [www.google.com](http://www.google.com)





# Electronic Health Record Tool to Improve Interprofessional Communication and Outcomes related to Early Mobility in the Intensive Care Unit

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1. University of Illinois at Chicago College of Nursing; 2. University of Iowa Hospitals and Clinics



## Project Nature and Scope

For intensive care patients, early mobility improves physiologic and psychological outcomes.<sup>3,5</sup> Effective mobilization programs rely on interprofessional, team-based collaboration.<sup>1</sup> Ineffective interprofessional communication is a barrier to positive mobility-based outcomes at a large academic medical center's 26-bed medical intensive care unit (MICU).

**PICO:** For healthcare clinicians in a MICU, what education and interprofessional collaboration strategies as compared to standard communication methods (e.g. shift report) improve staff knowledge and practice of the existing early ICU mobility program, interprofessional communication related to mobility, patient outcomes, and cost?

## Supporting Evidence

Early ICU mobility program benefits:<sup>3,5</sup>

- Improved physiologic/psychological outcomes
- Decreased length of stay and ventilator time
- System benefit, cost reduction

Standardized communication using validated tools (i.e. *Mobility Levels*) needed to observe mobility progression or regression throughout admission<sup>1</sup>

Success of early ICU mobility programs is based on effective interprofessional team communication<sup>2</sup>

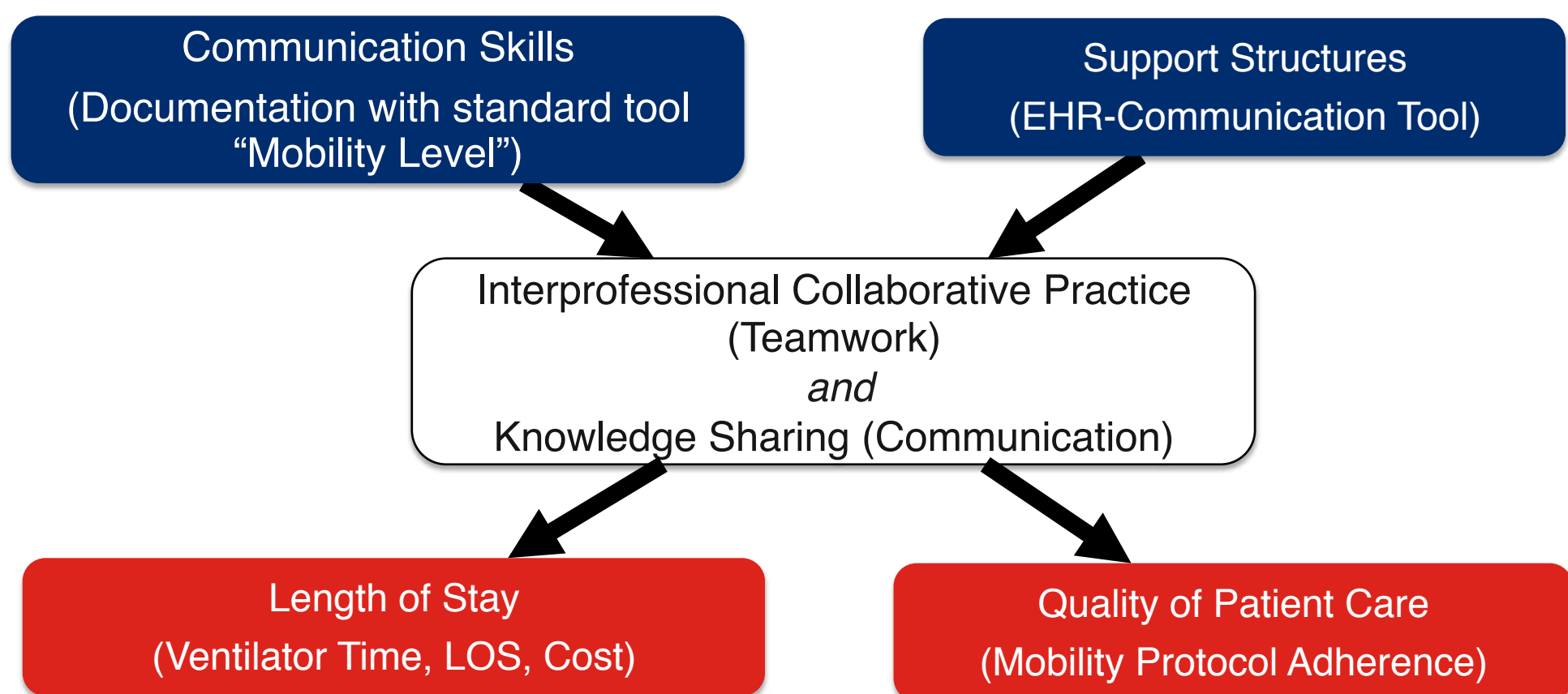
Electronic health record (EHR)-communication tools improve interprofessional communication<sup>4</sup>

- Provide current information to all care providers
- Create easy to access to information
- Demonstrate positive effect in numerous patient care settings
- Permit accurate and clear communication through standardized tools<sup>1</sup>

EHR-communication tools have not been used in early ICU mobility to date

## Project Implementation

### Theoretical Framework: Interprofessional Collaborative Practice



Adapted from Stutsky, et al., 2014 "Interprofessional Collaborative Theoretical Framework Model"

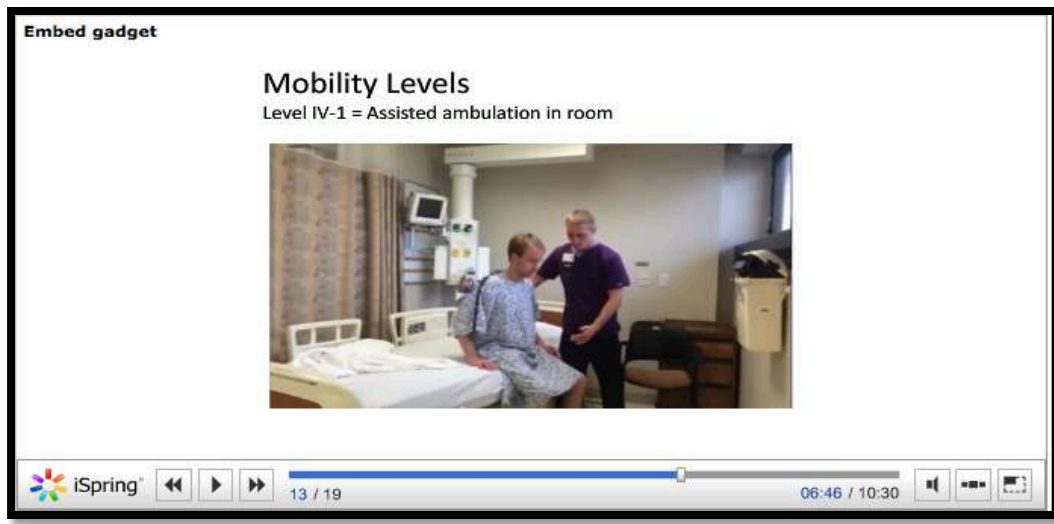
### Early ICU Mobility Interprofessional Collaboration (IPC) Program

#### Patient Chart Review - before and after implementation

- Inclusion: Mechanical ventilation within 24 hours for minimum 24 hours, baseline functional ability, "Full Code" or "OK to intubate"
- Exclusion: Pharmaceutical paralysis, chronic ventilator dependence, tracheostomy, acute massive neurologic injury, baseline immobile function, inter-ICU transfer within facility, deceased discharge

#### Phase 1: Staff Assessment and Education

- Staff baseline knowledge / satisfaction survey
- Staff view online "eMobility" module educational presentation
  - Evidence-base for early ICU mobility
  - Existing early ICU mobility policy
  - Currently used *Mobility Level* scale
  - Introduce EHR-communication tool



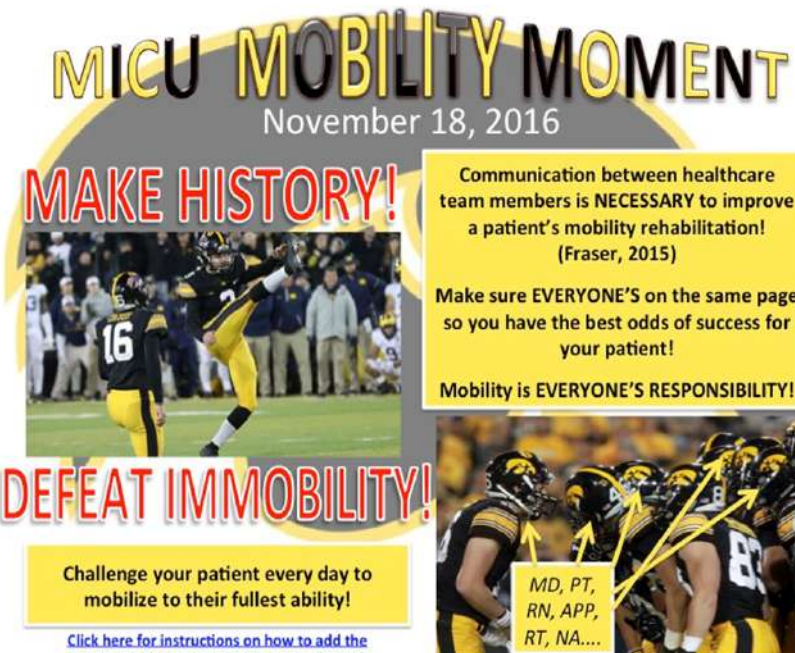
#### Phase 2: EHR-Communication Tool Implementation

- EHR-communication tool Go-Live!

PATIENT NAME	ROOM	ATTENDING PROVIDER	CODE STATUS	DIAGNOSIS/PERTINENT MEDICAL INFO	MOBILITY LEVEL RN	MOBILITY LEVEL PT
Jon Smith	22	Dr. Jones	FULL	COPD Exacerbation, 40% Volume Control, 8 PEEP Fentanyl drip Plan for CT Chest today	2	3
Dave Jones	13	Dr. Thomsen	DNR	DKA 2L nasal cannula Insulin drip	3	3

#### Promoting Adherence to Mobility Protocol and EHR-Tool

- Bi-weekly "Mobility Moment" via staff newsletter
  - Reminder of guidelines, literature, & EHR-tool
- Project team leader-staff meeting
  - Promote EHR-communication tool
  - Address questions or concerns
- Mobility Level* visual aids
  - Requested during implementation by staff
  - Placed at charting stations



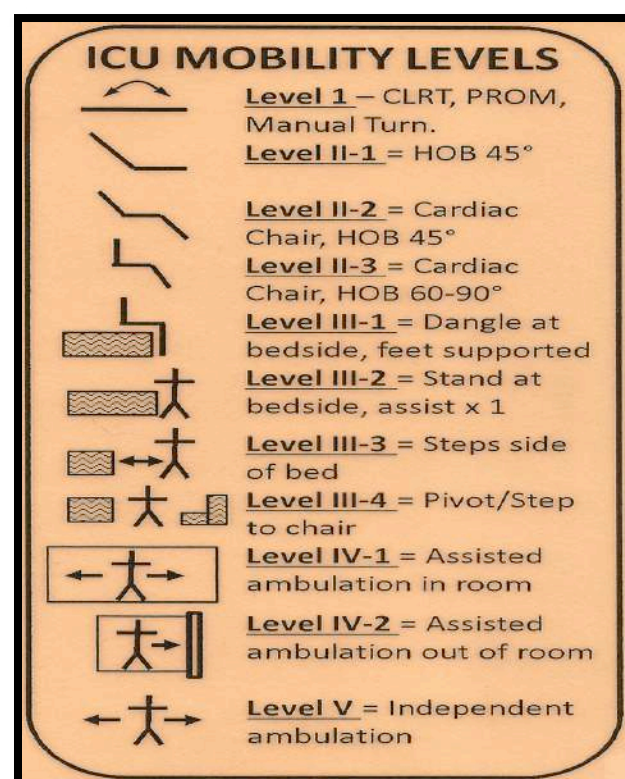
## Evaluation Criteria

### Staff Survey Outcomes

- Knowledge Score – Summation of 7 knowledge questions
- Satisfaction, frequency, and effectiveness of mobility-related interprofessional communication
- Impact of eMobility module and EHR- communication tool on adherence to mobility guidelines and individual documentation

### Patient Chart Review Outcomes

- Hours to mobility goal by nurse and physical therapist (separately)\*
- Duration of mechanical ventilation
- Length of Admission to ICU
- ICU Cost



## Outcomes

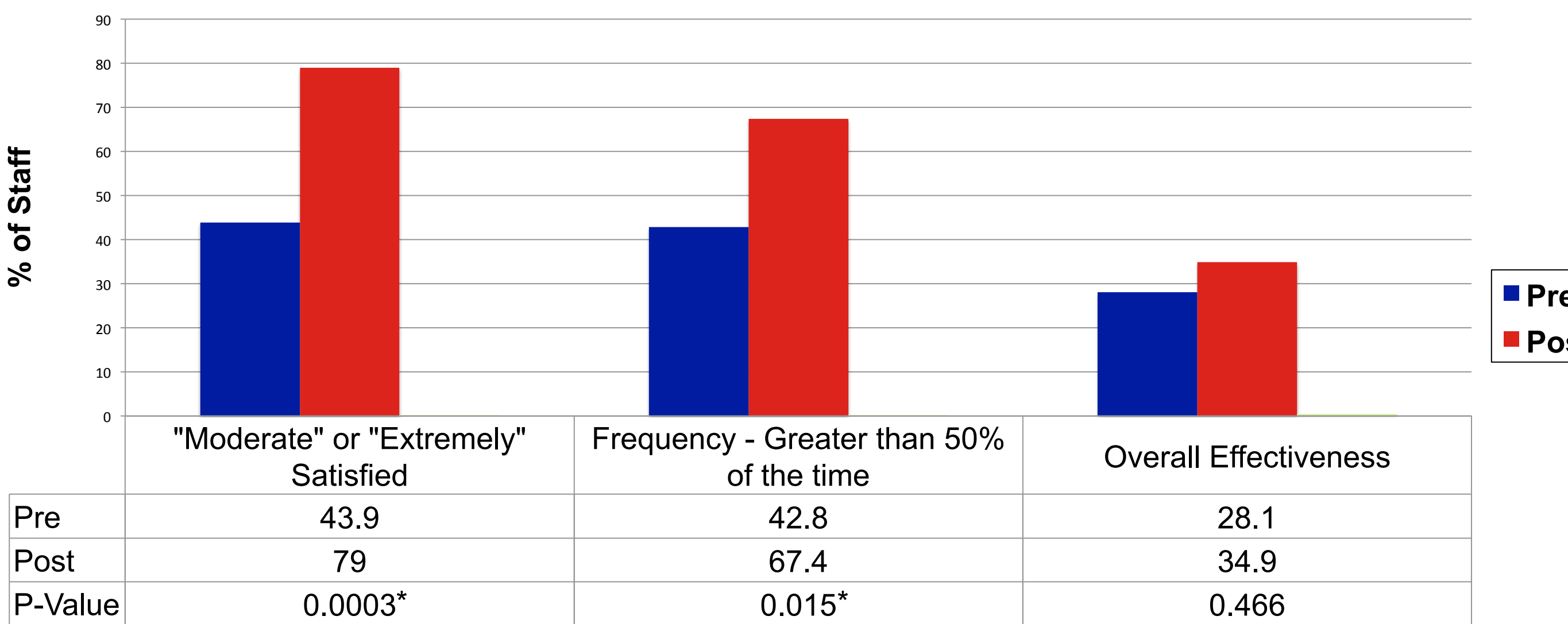
### Staff Data

#### Staff Responding to Survey

	Attending Provider	Resident Provider	Fellow Provider	ARNP/PA Provider	Staff Nurse	Nurse Manager	Physical Therapist or PT Assistant	Respiratory Therapist
Pre	7	1	3	3	38	0	1	4
Post	6	1	0	2	33	0	1	0

No statistical difference between groups, two-tailed independent samples t-test

### Staff Perception of Interprofessional Communication Attributes



\* Statistically Significant p<0.05, Chi-Square test

### Staff / Education: Key Points

- Mobility knowledge increased; not significant (p=0.280)
- Helpful strategies with moderate or greater impact on guideline adherence
  - eMobility module to reinforce mobility levels/protocol (83%)
  - EHR-tool to enhance interprofessional communication (83%)
- Education Requested (9 responses)
  - Continued staff development (7)
  - Instructional visual aids for patients/families (2)

### Patient Data

#### Patient Group Comparison

	Pre	Post	P-value
<b>Charts Reviewed</b>	139	137	N/A
<b>Charts Included</b>	32 (23%)	31 (22.6%)	0.93
<b>Age (mean)</b>	51.8 yrs.	56.5 yrs.	0.24
<b>Gender</b>	Male = 22 Female = 10	Male = 18 Female = 13	0.44
<b>Admitting Diagnosis</b>	Pulmonary = 10 Cardiovascular = 3 Neurologic = 8 Gastrointestinal = 4 Renal = 1 Other = 6	Pulmonary = 8 Cardiovascular = 1 Neurologic = 10 Gastrointestinal = 5 Renal = 0 Other = 7	0.58

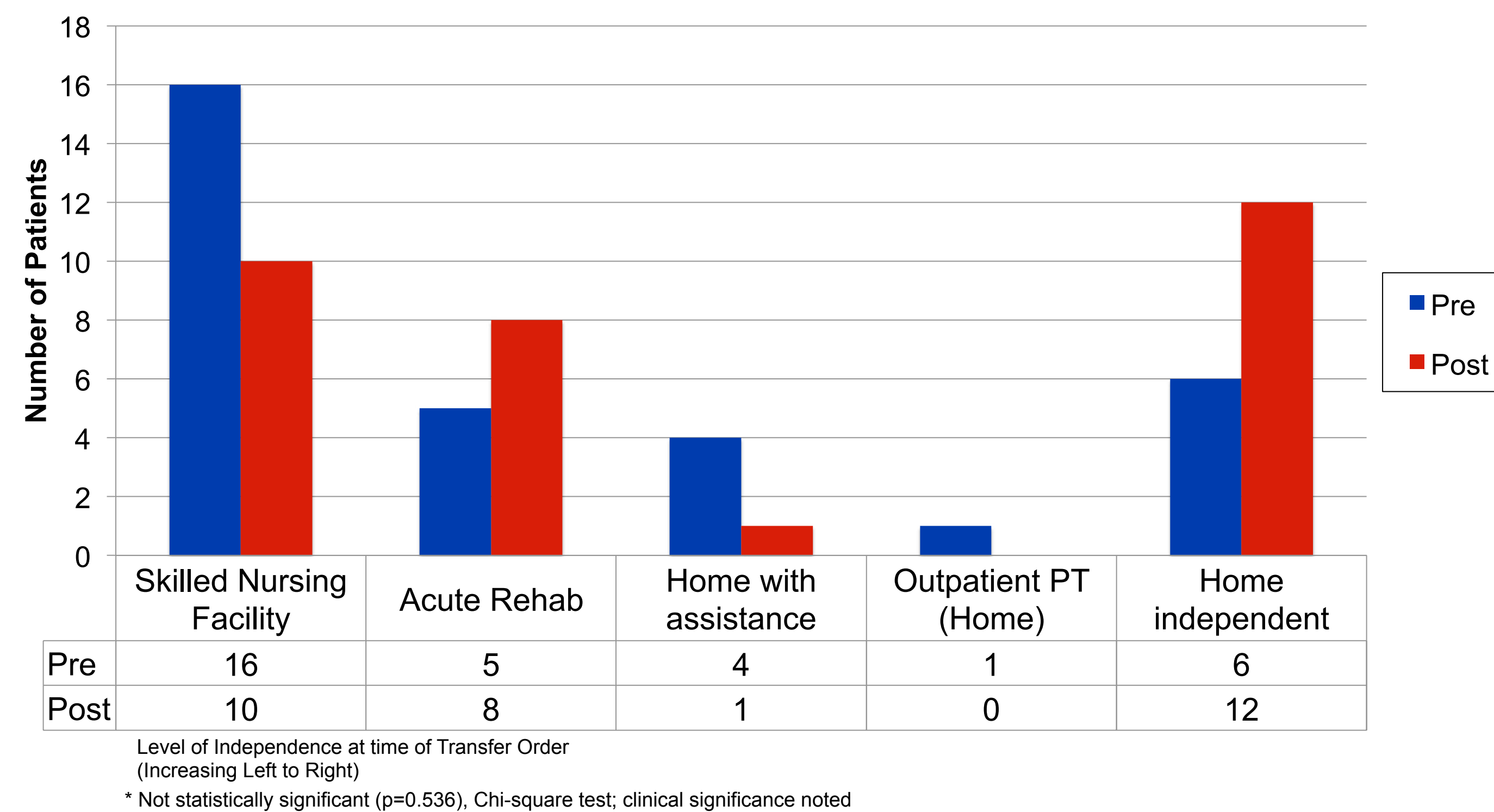
No statistical difference between groups, two-tailed independent samples t-test

#### Patient Specific Outcomes

	Pre-Implementation	Post-Implementation	Hours Difference	P-value
<b>Hours from Admit to Mobility Goal (RN)</b>	116.323	86.696	-29.63	0.023*
<b>Hours from Admit to Mobility Goal (PT)</b>	122.448	84.329	-38.1	0.015*
<b>Hours on Ventilator</b>	95.194	68.232	-26.96	0.129
<b>Hours in ICU</b>	164.747	108.155	-56.59	0.023*

\* Statistically Significant p<0.05, two-tailed Mann-Whitney test

### Discharge Disposition from ICU



### Decrease in ICU Cost

ICU Cost	Percent Change	P-value
<b>TOTAL Cost</b>	- 39.5%	0.041*
<b>Hospital Cost</b>	- 39.2%	0.027*
<b>Professional Fees</b>	- 30.9%	0.18

\* Statistically Significant p<0.05, Mann-Whitney test; average per patient admission encounter

### System outcome implications

- Reduced ICU costs benefits patient, 3<sup>rd</sup> party payer, and institution
- May allow expanding rehab or nursing staff to support early mobility practices 7-days per week

## Limitations

#### Staff / Education

- Transiency of staff
- Inability to mandate completion of eMobility module
- Non-paired survey responses

#### Patient Data / EHR-tool

- Inability to mandate use of EHR-tool; unknown compliance / fidelity
- Staff ability to "copy-forward" previous documentation without review
- No control for acuity level/other potential influences on outcomes

## Recommendations

- Validate outcomes with expanded sample size and time period
- Routine distribution of early ICU mobility education (i.e. "Mobility Moment") to promote sustainability of practice
- Expand quality improvement project to appropriate clinical settings

## Conclusions

- Coupling staff education and EHR-communication tool in an early ICU mobility program may improve ICU patient outcomes.
- Reinforcement of staff education can improve perception and reported adherence to mobility protocols, improve outcomes, and decrease ICU-associated risks
- Regular reinforcement techniques may sustain practice change
- Collaborative team care enhances health care cost savings.

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## Acknowledgements

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# Acute Care Therapists Leading Change in Patient Care Initiatives :

## A Transformation in Hospital Infection Control Practice

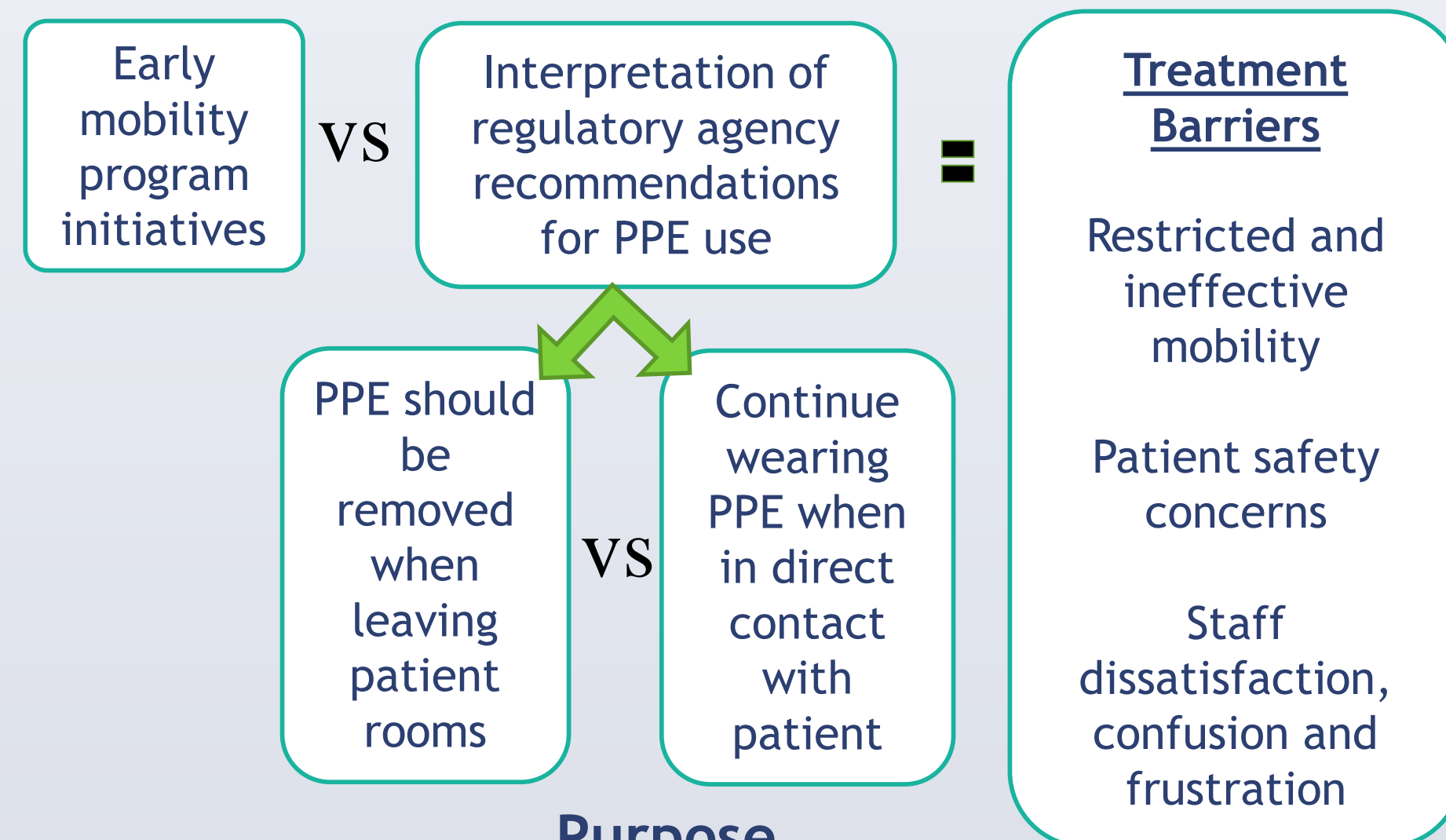
Roslyn M. Scott, PT, MPT; Ana Lotshaw, PT, PhD, CCS

Baylor Institute for Rehabilitation at Baylor University Medical Center in Dallas, Texas



### Background

Patients in acute care settings continue to increase in acuity and often experience low endurance, significant balance and gait deficits, and many other functional deficits requiring therapeutic interventions to occur outside of the constraints of a patient's room. Conflict arises when the initiatives for evidenced based early mobility programs contrast with administration's interpretation of regulatory agencies recommendations for use of personal protective equipment (PPE) that restrict mobility.



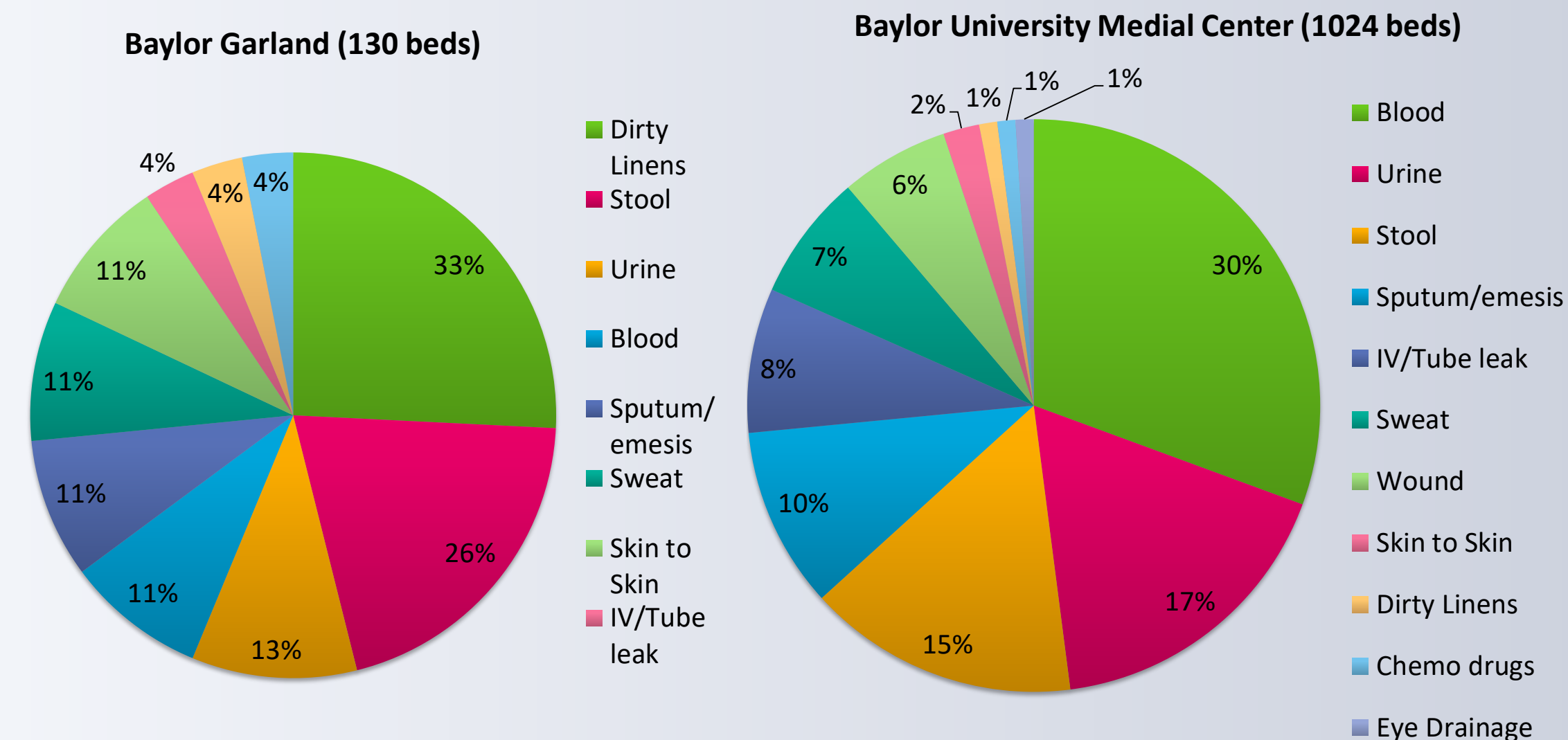
### Purpose

To enact a positive change in practice for the use of PPE that impacts patient mobility and coincides with administration's interpretation of recommendations. This will be achieved by using observational data, current evidence and dialogue.

### Methods

- Literature review of current practice
- Multiple meetings between therapy leadership & Infection Control departments
  - Establish an open dialogue to determine what constitutes patient care environment
  - Identification of patient safety concerns
- Videotaped examples of patient/therapist/PPE interactions during actual therapy treatment sessions were made to highlight therapist concerns with current policy
- Incidences and descriptions of contact with bodily fluids during therapy sessions were collected from one of the healthcare system's regional centers and the flagship medical center

### Chart 1: Incidences of Contact With Bodily Fluids



### Table 1: Patient Bodily Fluid Exposure During Therapy Treatment Sessions

Patient incontinent of urine and/or stool with or without garment
Handling rectal tube and/or foley catheter
Patient with oral and tracheal secretions
Malfunctioning arterial line
Multiple wound sites draining/leaking
Patient vomited during stair training in stairwell
Unexpected Chemo spill while ambulating
Leaking JP Drain—JP Drain snapped open
Surgical/ wound dressings needed reapplication
Leaking IV site
Hemovac tubing disconnected during ambulation

### Results

- Data from facilities (including incidences, Chart 1, and types of exposures, Table 1) confirmed that contact by the therapist and the patient with the environment was unintentional and unavoidable.
- The videotaped examples highlighted that therapy's primary focus was to maintain direct physical contact with the patient, not the environment during therapeutic activity training.
- The combined results provided evidence to support a change in the system-wide Standard and Isolation Precautions policy consistent with CDC and Infection Control that did not hinder patient's functional recovery.
- An agreed upon system-wide policy addendum was created that extends the patient care environment beyond the patient's room into the hallway, thus allowing the use of PPE during therapeutic activity.

### Lessons Learned/Importance

- Therapy leadership brings a valuable and functional perspective to policy discussions that supports patient care initiatives, and patient/staff safety.
- Therapy leadership can enact positive change on behalf of different aspects of patient care by:
  - Questioning policy implementation that unnecessarily restricts rehabilitation services
  - Maintaining persistence in opening areas of dialogue at the appropriate administrative level
  - Offering evidence based solutions that accommodate all patient care providers

### Acknowledgments

Courtney LaFollette, DPT; Jennifer Koch, DPT; Kimberly Newman, RN, BSN, CIC; Katherine Weigand SPT

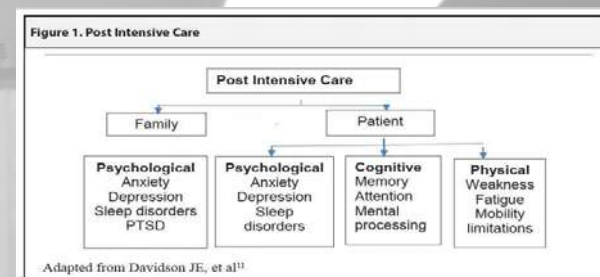


# My ICU diary and EMDR Technique to Alleviate Anxious Nightmares

## Introduction



Post Intensive Care Syndrome (PICS) is a big deal for patients and their families. An ICU stay can traumatize patients and their family members (Davidson, 2011). Problems with falling or staying asleep, nightmares and unwanted memories are typical signs of PICS. Reminders of their illness may produce intense feelings or strong, clear images in their mind - reactions to these feelings may be physical or emotional. Eye movement desensitization and reprocessing (EMDR) is an effective treatment for alleviating trauma symptoms, and the positive effects of this treatment have been scientifically confirmed under well controlled conditions (Hase, 2017). H. Dellucci developed the Letters Protocol, which we use with the ICU diary of the patient and family members. The provision of an ICU diary is effective in aiding psychological recovery and reducing the incidence of new PTSD (Jones, 2010).



## Objective



The aim of this study was to evaluate whether symptoms of post-traumatic stress, anxiety and depression assessed with PTSS-14 questionnaire and SUD (subject of disturbance) scale are significantly different after 2 EMDR sessions. We hypothesize that the EMDR technique during reading of the ICU diary helps patients and family members to work through their difficult memories and nightmares and to better integrate the ICU stay in their narrative.



## Results



This pilot study with 8 patients and 2 family members showed us the benefit of only two EMDR sessions. Before EMDR and after EMDR scores on the PTSS-14 questionnaire were better for 9/10 participants (median, 37; IQR, 21-51) ( $P = .007$ ). Further analysis will be conducted in a larger cohort of patients and family members. All participants experienced less distress after the EMDR sessions as marked on the SUD scale.



## Acknowledgement

We would like to thank all participating patients and families.



# Establishing Safe and Effective Mobilization For Patients With a Novel Temporary Mechanical Circulatory Support Device



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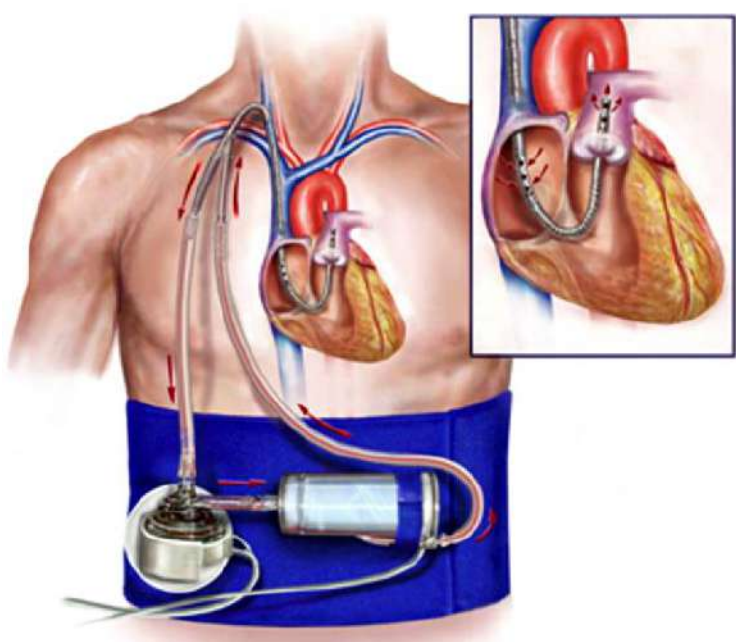
Physical Therapy  
RUSK REHABILITATION

## OBJECTIVES

- Mechanical Circulatory Support (MCS) devices are used for patients in heart failure when positive inotropes are unable to provide sufficient support.
- Temporary MCS devices provide a bridge to recovery or a bridge to decision, allowing the injured tissue time to recover function.
- These devices are indicated when the outcome is uncertain or when muscle function is expected to recover.
- The TandemHeart (TH) is a temporary MCS device intended for less than one week of use.
- Indications for the device include cardiogenic shock, chronic heart failure with acute decompensated Right Ventricular Failure (RVF), myocarditis, and post-partum cardiomyopathy.
- Contraindications include severe aortic regurgitation and right or left atrial thrombus.
- The TH improves hemodynamic stability and decreases pulmonary pressure while promoting right ventricular remodeling and improved contractility.

## BACKGROUND & METHODS

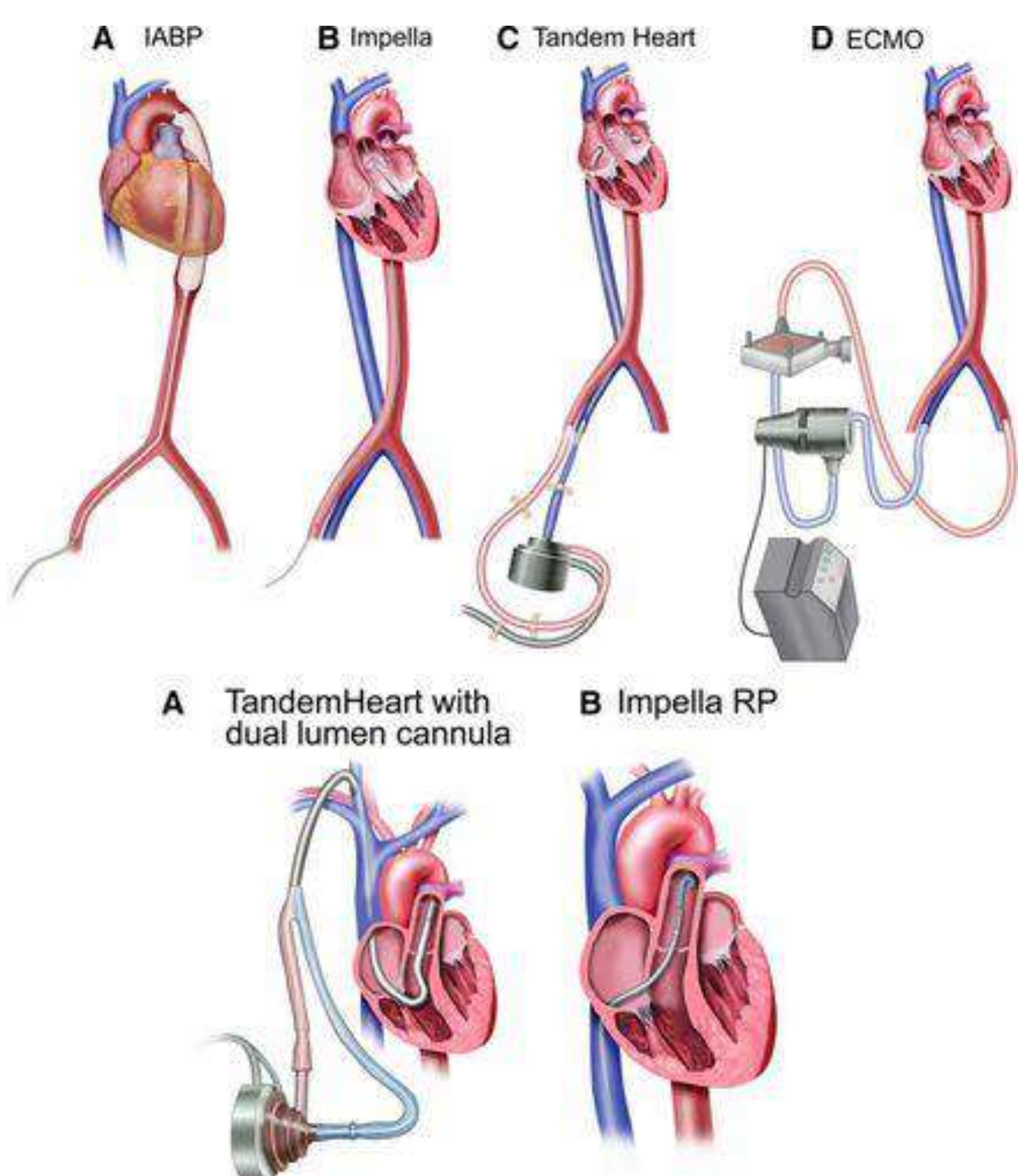
- Physical Therapy (PT) was consulted on 64 year old male who presented in cardiogenic shock requiring intra-aortic balloon pump (IABP) placement, followed by left ventricular assist device (LVAD) implantation.
- His past medical history included congestive heart failure with reduced ejection fraction, gout, hypertension, and mitral regurgitation.
- On post op day 1 following LVAD implantation the patient's cardiac status declined and he developed RVF. A TH was implanted with right internal jugular cannulation.
- Since the TH was a novel device to the department, PTs sought clarification from the surgeon regarding precautions and restrictions while also considering previously established early mobility guidelines.
- Due to its size, anchor, and placement, mobilization with the TH was more feasible than other MCS devices such as extra-corporeal membrane oxygenation (ECMO) and IABP.
- The Activity Measure for Post Acute Care (AMPAC) is a standardized tool used to assess activity limitations and rate a patient's functional abilities. It was tracked daily to show the patient's progress throughout his hospital stay.



## TIMELINE & IMAGES

### DAYS POST LVAD IMPLANTATION

- 1 RVF → TandemHeart placed
- 2 On medical hold
- 3 Bed level session  
(Supine exercises, breathing exercises, LVAD education)
- 4 Pt tolerated sitting EOB for 5 min  
(Max assist x 2 PTs, RN, and rehab aide for supine-sit)
- 5 Sit to stand transfer, tolerated 10s of standing  
(Mod assist x 2 PTs, RN and aide for lines management)
- 6 BID sessions: Sit to stand transfer (Min assist of 2 PTs)  
Ambulated 5 steps (Bilateral hand held assist with 2 RNs for chair follow and line management)
- 7 Bed level session  
(Supine exercises, breathing exercises, LVAD education)
- 8 Ambulated 8 steps using RW (Min assist from PT, with RN and aide for line management)  
TandemHeart explanted



## RESULTS

- There were no adverse events during mobilization of this patient.
- He completed 39 PT sessions in his 45 day admission: 3 PT sessions were pre-op (including 1 while being supported by an IABP), and 9 PT sessions while on the TH.
- The patient ambulated 500 feet with supervision using a cane prior to discharge home with self care.
- His participation in therapy was limited by chronic gout pain and decreased motivation.

AMPAC Score		
IE	Initial mobility	Discharge
6/24	9/24	20/24

## CONCLUSIONS

- Options for temporary MCS include IABP, Impella, ECMO, and TH.
- Post operative early mobility is essential for hemodynamic improvement and a return to function.
- The TH is unique due to its size and the ability to tether the device to the patient. A perfusionist does not need to be present to manage the equipment, and safe mobility can be achieved with less assistance.
- This patient initially required 2 PTs and 2 others (RN/PT aide) for line management to transfer from supine to sitting. Immediately prior to TH explant, he took steps with assist of one PT with 2 others for lines.
- As MCS devices continue to evolve, PT interventions must adapt as well.

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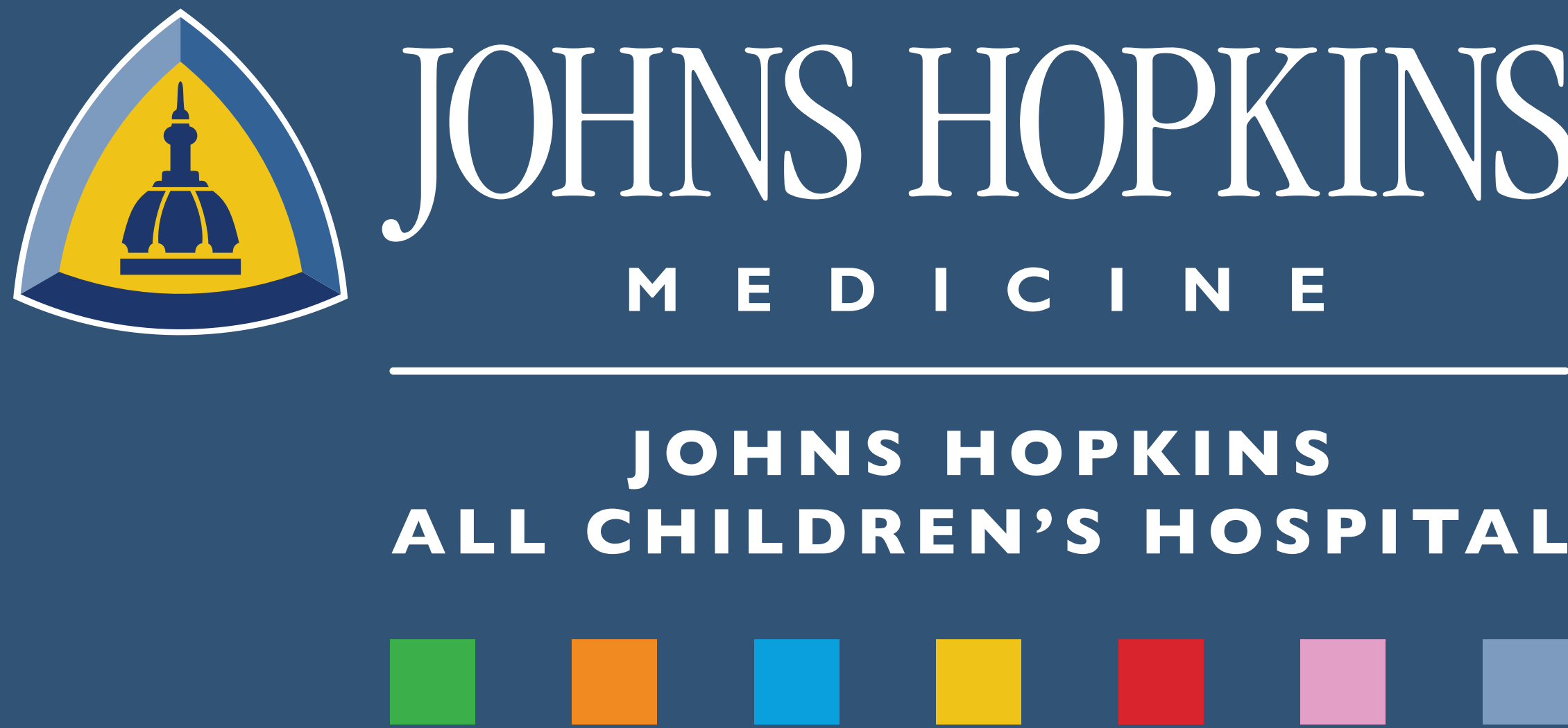
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<https://www.ahajournals.org/doi/full/10.1161/CIRCINTERVENTIONS.116.004337>



# Physical Therapy Interventions and Early Mobility In the Neonate on ECMO

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## Background

- Extracorporeal membrane oxygenation (ECMO) has evolved as a life-saving measure for neonates decreasing the mortality rate. Interest has therefore shifted from the reduction of mortality toward prevention of morbidity.
- Neonates on ECMO are difficult to comfort, and research shows an increased benzodiazepine and second-line agents requirement in this subpopulation which associate with prolonged ECMO runs, increased ventilator days, and increased intensive care unit stay.
- Neonatal Individualized Developmental Care Assessment Program (NIDCAP) focuses on enhancing the caregiver’s understanding of the neonate self-regulatory capacities. Research indicates the newborn patient responds to a developmental approach used in NIDCAP and to non-pharmacological pain management used in the late premature infant.
- Evidence-based studies have shown the importance of neuroprotection, therefore minimize stress and pain, offer positive sensory experiences, minimize parent-infant separation, protect sleep and promote strong bond with family are important to implement with theses patients.
- There are extensive studies of the infant's behavior in the critical care units and their arching posture, neck hyperextension, scapular retraction, and restless behavior. These behaviors the neonates present are reactions to primitive reflexes stimulation that often displays various degrees of response. Persistent, vigorous, weak or unsymmetrical responses are linked with neurological impairment in the high-risk newborn. The development of voluntary motor actions by an infant depends on a declining intensity of the primitive reflexes.
- Critical ill infants do not go through the motions and activities that mature the primitive reflexes in the neonate, and they may present in an exaggerated response, been potential for retention of the reflex.

## Objectives

1. To describe physical therapy interventions and management in neonates on ECMO.
2. To describe the developmental supportive care to be applied to neonates on ECMO.
3. To describe the approach to education and support to the families with the critical ill neonate on ECMO.
4. To describe handling and positioning on the neonate on ECMO to decreased influence of tonic labyrinthine reflex in supine.

## Assessment

A valuable tool is the NIDCAP observation on the fragile infant’s behavior at the time of care /position change. At this time we assess the neonate coping skills for self-regulation and response to interventions guided to decreased the stressors and calm the infant. Analyze the influence of the tonic labyrinthine reflex (TLR) in supine. The TLR in supine gets the neonate in a position that gets them unable to tuck, and it is observed by the shoulder/ scapula retraction or leg in extension at the time of stress. Tonic Labyrinthine reflex in supine based on the primitive reflex profiles (PRP), is considered the most sensitive indicators of early motor abnormality when is retained, and it is exaggerated in most of the infants that remain in supine in the first weeks of life. Education of the parents was evaluated through the ability demonstrated when assisting at care time, diaper change, pacifier stimulation/distraction, holding hands and talking to their infant. Prolonged stretching of tensed/ shortened muscles involved on TLR when in supine shows a relaxation on the infant.

## Interventions

Table 1: Finding and interventions for the Neonate on ECMO		
Observation	At care time	Intervention
Behavior communication signal of autonomic, motor, state, and self regulation system	<ul style="list-style-type: none"><li>• Sedated/sleeping</li><li>• Spontaneous activity</li><li>• Stressed, muscle tone is increased, tremors, color changes, crying</li><li>• Sucking on ET tube</li></ul>	<ul style="list-style-type: none"><li>• Discuss review sedation as possible</li><li>• Modulate care and handling, pauses and containment if stress</li><li>• Give supported boundaries, firm touch, improve position to decreased TLR in extension, modulate care and give boundaries, pace care based on infant cues, muscle elongation /stretching and soft tissue mobilization to tensed muscles modified to meet the needs of the baby.</li><li>• Clean mouth gentle to promote pleasant sensations in oral area, offer pacifier (purple preemie pacifier to avoid crowd mouth and gaging)</li></ul>
Position	<ul style="list-style-type: none"><li>• Joints at resting position</li><li>• Joints at closed pack position</li></ul>	<ul style="list-style-type: none"><li>• Give Kudos to nurse to praise good work</li><li>• Improve positioning and educate bedside nurse and parents</li></ul>
Edema	<ul style="list-style-type: none"><li>• Head /face</li><li>• Hand/feet</li><li>• Trunk</li><li>• Diaper and line’s tension</li></ul>	<ul style="list-style-type: none"><li>• With elbow in flexion make a gentle distraction to descend the shoulders, it will improve lymphatic flow ( caution on the right side, avoid if change ECMO flow)</li><li>• Position elevated, avoid excessive flexion, elbow, knee. Gentle low range range of motion</li><li>• Lymphatic drainage (take a class)</li><li>• Diaper need to be loose to avoid any pressure on skin, also look at lines/tubes over any parts of body</li></ul>
Parents	<ul style="list-style-type: none"><li>• In the room, away from baby</li><li>• At the bedside</li><li>• Participating in care</li></ul>	<ul style="list-style-type: none"><li>• Educate importance of participation on their baby's care, encourage them and offer support so they will become comfortable caring for their baby</li><li>• Educate awareness of lines and tubes in the incubator and around. Educated how to read baby's cues.</li><li>• Help them feeling essential for the baby and show baby's good reactions to their care even if is just holding baby's hand or talking to their baby.</li><li>• Discuss sensory and how caresses at this time maybe too much stimulation an a firm touch and holding give a better response.</li><li>• Education on how to help at the time of care. Promote closeness and bonding between parents and infant</li><li>• Teach how to offer pacifier, touch the lips and when baby open mouth direct tip to the palate. Follow baby's cues. Use smaller pacifier.</li></ul>
Handling for position change / linen change/ weighting/mobility	<ul style="list-style-type: none"><li>• Who is handling the infant and how</li></ul>	<ul style="list-style-type: none"><li>• Communicate and task assignment, who is handling baby must hold pelvis in posterior tilt to avoid reaction of TLR in extension and agitate infant. ECMO nurse help with head and cannulas but need to avoid head in extension when lifting</li><li>• Movement must be slow and modulated and not too high</li><li>• Keep neonate in tucked position with pelvis in posterior tilt</li><li>• Maintain some boundaries to keep patient in tucked position</li></ul>
Bath time	<ul style="list-style-type: none"><li>• Best when minimal assessmnet to be done to keep it short</li></ul>	<ul style="list-style-type: none"><li>• Think of a swaddle bath, clean by area and cover, maintain the tucked position, include parents at possible, if baby stressed pause and try calming with boundaries and positioning.</li></ul>
Environment	<ul style="list-style-type: none"><li>• Sound</li><li>• Light</li></ul>	<ul style="list-style-type: none"><li>• Attend to alarms promptly,</li><li>• Avoid direct light to eyes, cycle day and night appropriately but avoid too bright on day time</li></ul>

Table 2: Joints at resting position		
Joint	Position	
Acromioclavicular	Shoulder depression	
Glenohumeral	Flexion 30, abd 55, internal rotation	
Elbow	Flexion 30,supination 10 degrees	
Hip	Flexion30, abd 30, small ext rotation	
Knee	Flexion 25 degree	

Table 3: Tonic Labyrinthine Reflex supine		
Grade	Response	
0	Absent, (this may be seen in the floppy baby)	
1+	Increased extensor tone is felt in the neck, shoulders, trunk, or lower extremities, but shoulder retraction and extremity extension are not observed	
2+	With the head in extension, there is visible shoulder retraction. Trunk or leg extension (<180°) may be noted; neck flexion results in shoulder protraction within 5 s and the disappearance of extensor posture	
3+	Response as in 2+, but with head flexion, shoulder retraction or full (180°) extension of lower extremities persists (5-30 s).	
4+	With head flexion, shoulder retraction or full lower extremity extension persist (for >30 minutes)	

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Picture of a intensive care unit with an incubator and a baby, surrounded by ECMO, Ventilator, chest tube container and multiple monitors, lines and medical stuff that intimidate the parents

Education to parents to overcome the environment and promote bonding with their baby.

Awake. Calm, Visual interaction

Picture of 3 different neonate intubated and on ECMO, interacting with mom and, awake and looking at her, holding her fingers, calm.

Picture of a baby on ECMO, intubated and still sucking a pacifier and engaging visually with mom

Picture of a neonate on ECMO, on ventilator, and mom is helping him to hand to mouth without moving the ET tube

Sucking pacifier, helps relax infant, bonding with parents, breastmilk productions., helps with motility

Hand to mouth, calms infant, elongate scapula retractors, promote hands to midline.

## Results

No events reported during the physical therapy interventions on the infants on ECMO. Bedside nurses had been requesting physical therapy participation during the bath, linen change and care as seen that it works better for infant, and families. During the care time, the physical therapist help in the modulation of activity and handling of the infant, supporting the baby, educating parents and positioning the neonate. An order set for physical therapy involvement since admission on infants with the diagnosis of CDH and infants on ECMO. New nurses are assisting to developmental class on positioning and handling of the neonate.g.

## Conclusions

The physical therapy intervention program presented here provided strategies used on the newborn in the intensive care unit and that may apply to neonates with ECMO support. The need for decreased morbidity improving sensorimotor development in this population and the decreased use of sedatives minimizing delirium, make it imperative to research interventions that may apply to the fragile newborn on ECMO. As physical therapy has advanced interventions to the medically involved infant in the NICU and fragile infant undergoing cardiac surgery, an area needing more studies is the infants on ECMO. The parental education and involvement appear to enhanced the level of confidence of the parents as well as promote early bonding between parents and infants. Limitations of implementation of a physical therapy program on this population have been the slow process of education of cluster care, education of physical therapy early order set, consistency in treatment approach depending on level of confidence of the care giver at bedside. Future neonate-specific research is essential to identify patients, to understand treatment priorities and rehabilitation strategies to improve functional recovery in critically ill infants.



# Nurses' Perceived Barriers and Educational Needs for Early Mobilization of Critically Ill Patients in Korea

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## Background & Purpose

- Early mobilization (EM) of critically ill patients is an evidence-based intervention designed to improve treatment outcomes and enhance quality of life following intensive care. However, **several barriers exist to its establishment in clinical practice.**
- The objective of the present study was **to identify barriers perceived by critical care nurses, corresponding educational needs, and provide useful information for program implementation in Korea.**



## Methods

- Research Design** : A cross-sectional, descriptive study
- Participants** : A convenience sample of 151 critical care from 4 tertiary hospitals, 3 secondary hospitals, Seoul
- Data collection period** : From April to June, 2017
- Instruments**

### Overall Provider Barriers Scale

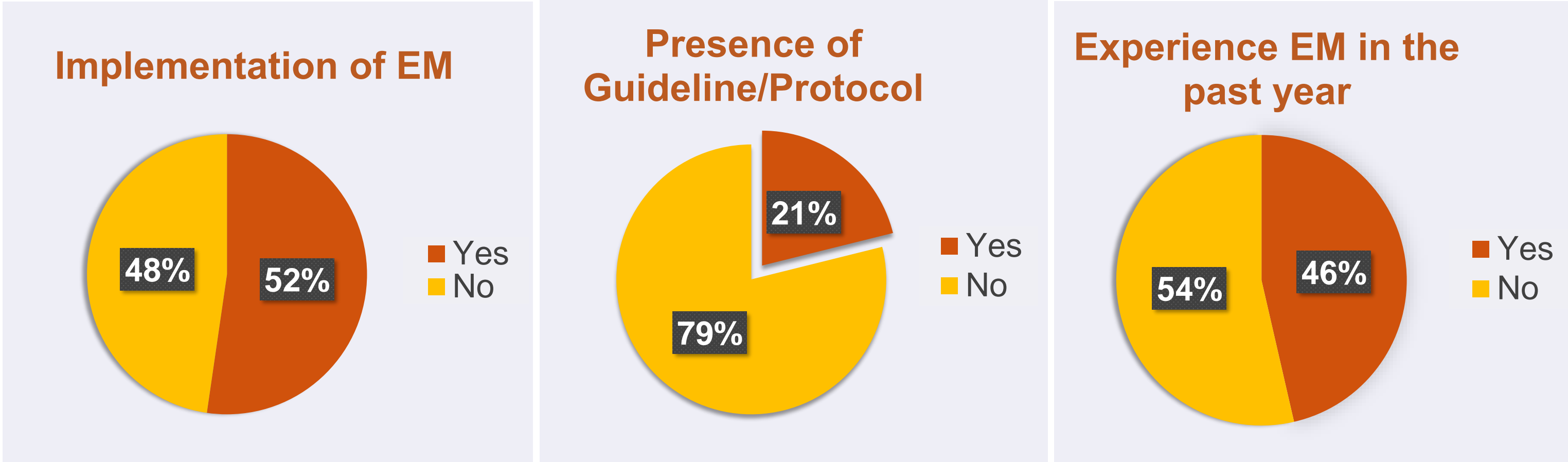
- Permission by Dr. Hoyer from JHM
- Development based on theoretical framework
- Translation - Back translation
- Obtain Content Validity Index (CVI) from nine critical care experts. I-CVI, S-CVI/Ave (.92), Cronbach's  $\alpha$  original (.70), This study (.81)
- Revised 24 items: Knowledge (4 items), Attitude (8 items), Behavior (12 items)

### Educational Needs

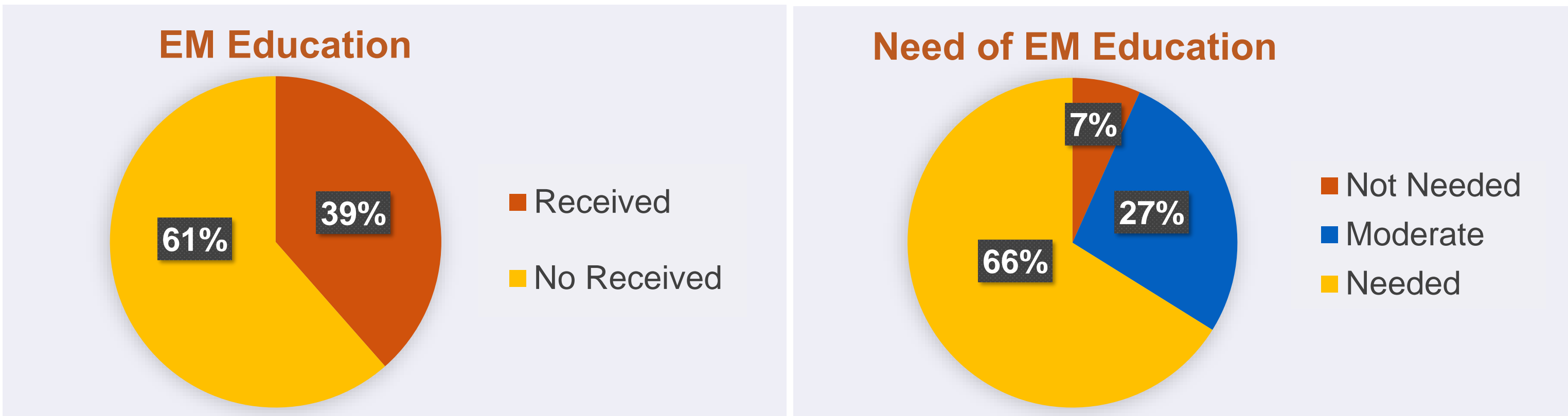
- Development by Literature Review & Expert's Opinion
- I-CVI, S-CVI/Ave (.98), Cronbach's  $\alpha$  (.89)
- Total 12 items

## Results

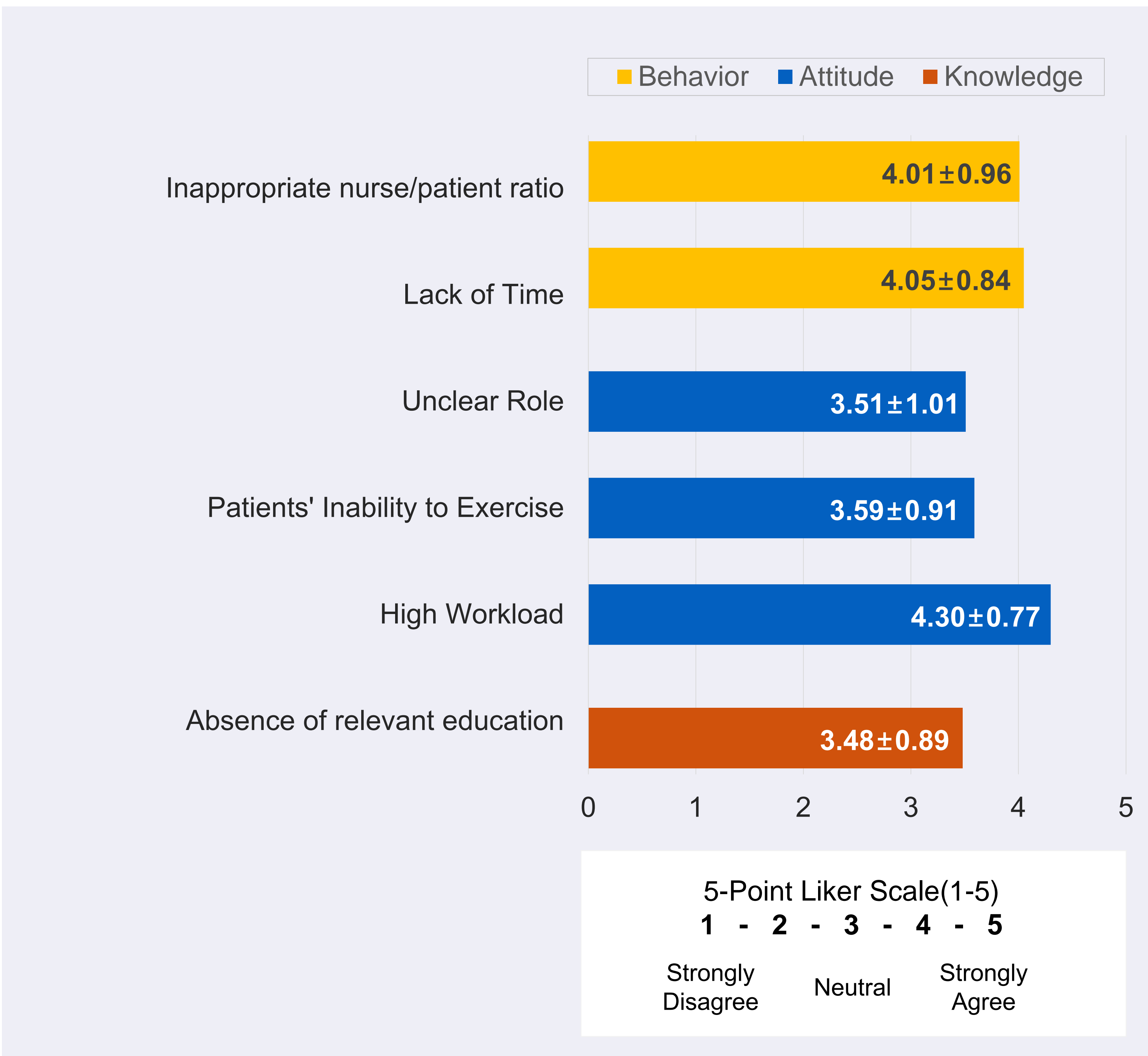
### Characteristics of Participants' Experience of Early Mobilization(EM)



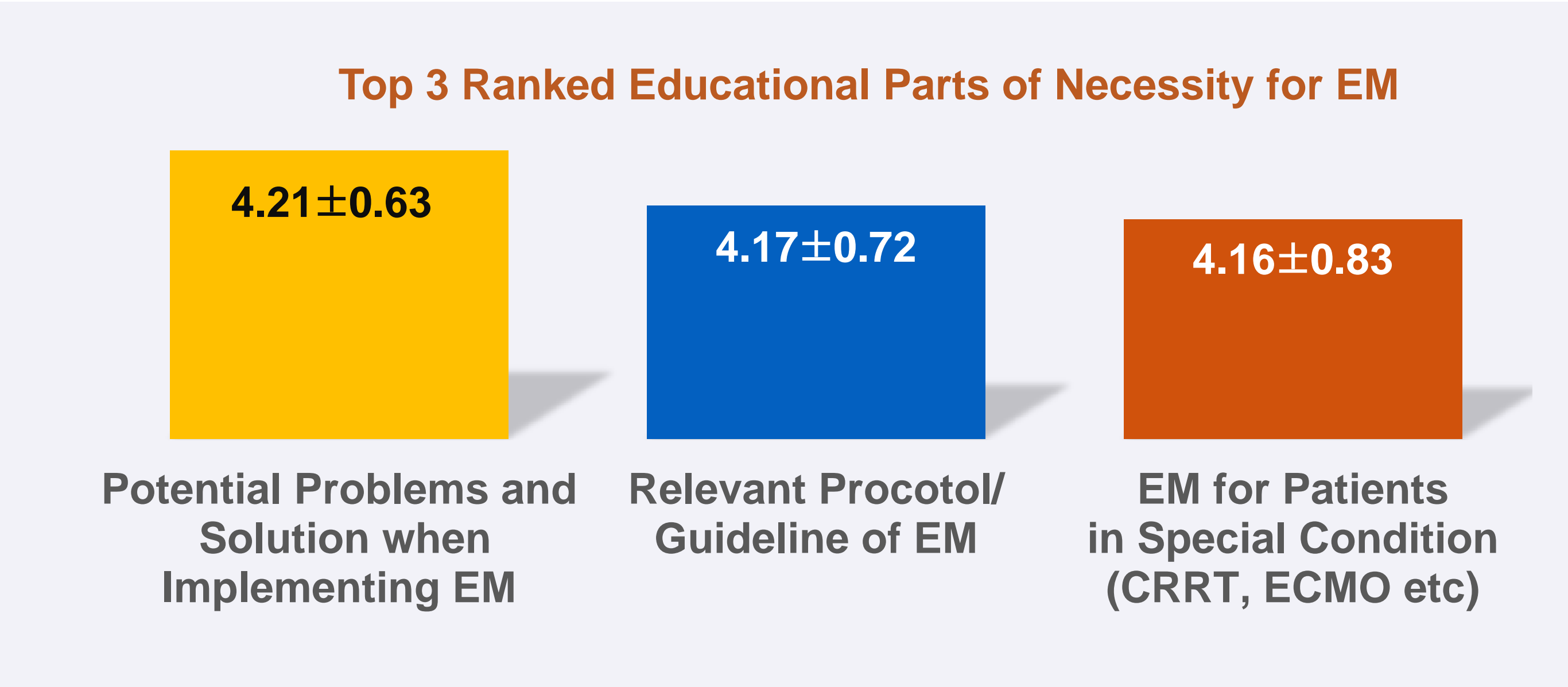
### Education Characteristics of Early Mobilization(EM)



### High Scored Perceived Barriers to Early Mobilization(EM)



### Educational Parts of Necessity for Early Mobilization(EM)



### Difference in Perceived Barriers to Early Mobilization(EM) by Staff Arrangement and Participants' Experience and Education Status

Characteristics	n	Barriers to Early Mobilization							
		Total		Knowledge		Attitude		Behavior	
		M ± SD	t or F(p)	M ± SD	t or F(p)	M ± SD	t or F(p)	M ± SD	t or F(p)
Presence of guideline/protocol									
Yes	32	3.02 ± 0.30	-2.206	2.97 ± 0.56	0.286	3.09 ± 0.50	-2.065	3.00 ± 0.33	-3.660
No	119	3.16 ± 0.40	(.031)	2.93 ± 0.60	(.776)	3.29 ± 0.48	(.041)	3.26 ± 0.44	(.001)
Implementation of EM									
Yes	79	2.99 ± 0.38	-5.188	2.85 ± 0.62	-1.915	3.14 ± 0.49	-2.986	2.98 ± 0.38	-8.144
No	72	3.29 ± 0.32	(<.001)	3.04 ± 0.55	(.057)	3.37 ± 0.46	(.003)	3.46 ± 0.35	(<.001)
Experience with EM in the past year									
Yes	70	3.02 ± 0.41	-3.365	2.87 ± 0.64	-1.362	3.15 ± 0.51	-2.377	3.05 ± 0.44	-4.356
No	81	3.23 ± 0.33	(.001)	3.00 ± 0.55	(.175)	3.33 ± 0.46	(.019)	3.34 ± 0.39	(<.001)
Presence of critical care nurse educators									
Yes	84	3.08 ± 0.42	-1.743	2.89 ± 0.61	-1.141	3.22 ± 0.54	-0.743	3.14 ± 0.44	-2.074
No	67	3.19 ± 0.32	(.083)	3.00 ± 0.57	(.256)	3.28 ± 0.42	(.459)	3.29 ± 0.43	(.040)
Presence of critical care nurse specialists									
Yes	91	3.11 ± 0.41	-0.774	2.95 ± 0.62	0.286	3.24 ± 0.51	-0.279	3.14 ± 0.45	-2.150
No	60	3.16 ± 0.34	(.440)	2.93 ± 0.55	(.776)	3.26 ± 0.47	(.781)	3.30 ± 0.41	(.033)

## Conclusions

- Despite growing evidence as to the effects, safety, and feasibility of EM, various factors continue to hamper its implementation. **Identifying such barriers is a critical step for successful and sustainable EM. The present study is significant in that it is the first to assess perceived barriers, as told by nurses, at this early stage of the EM introduction process in Korea.**
- Of particular importance are attitude-related barriers, which were identified most frequently in the present sample. To overcome behavior-related barriers, appropriate staffing and organizational efforts should be established to maximize service usage within intensive care nursing contexts. **A lack of education is a significant barrier to EM implementation; therefore, customized programs led by critical care nurse specialists/educators should be designed based on components identified in the present study**
- The present findings could be used to facilitate EM implementation for critically ill patients in Korea so as to further improve patient outcomes.



# Psychology Consultation Patterns in a Medical Intensive Care Unit

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## Introduction

- ICU survivors frequently experience long-lasting impairments in:
  - mental health
  - cognition
  - physical functioning
- As a result, psychologists have a unique opportunity to:
  - promote adaptation to illness and engagement in rehabilitation therapies
  - employ interventions to help reduce patient suffering
  - improve patient outcomes

## Objective

To characterize psychology consultation patterns within a single medical intensive care unit (MICU) in a large, urban academic medical center.

## Design

Rehabilitation psychology consultation requests were prospectively tracked, with patient data retrospectively collected and analyzed, from April 2016 to February 2017.

## Results

- 79 consecutive psychology consultations were requested to address:
  - emotional distress (56%)
  - barriers to rehabilitation engagement (24%)
  - family engagement (13%)
  - cognitive disturbance (4%), and pain (4%)
- Patient characteristics were remarkably similar across race, gender, age, and marital status, except:
  - women were more likely to be consulted for emotional distress than rehabilitation engagement (64% vs 26%,  $\chi^2$  (1) = 7.41,  $p$  = .006)
- 27 (34%) of patient's with requested consultation had at least one comorbid mental health diagnosis at admission
  - 11 (41%) depressive disorder
  - 10 (37%) substance abuse disorder
  - 8 (30%) anxiety disorder
  - 3 (11%) severe mental illness

## Sample Characteristics

Characteristics	Psychology Consults (N=79) n (%) or $\bar{x} \pm SD$	Total MICU Admissions (N=1454) n (%) or $\bar{x} \pm SD$	$p$
Woman	43 (54)	687 (47)	.20
Race			.06
White	42 (53)	584 (40)	
Black	32 (41)	706 (49)	
Other	5 (5)	164 (11)	
Age (years)	56 $\pm$ 15	55 $\pm$ 16	.97
Marital Status		N/A	
Married	46 (59)		
Single	26 (33)		
Divorced	4 (5)		
Widowed	2 (3)		
Total MICU Length of Stay (days)	12 $\pm$ 9	4 $\pm$ 6	< .01
MICU Day at Rehabilitation Psychology Consult (days)	8 $\pm$ 6	N/A	
Mortality During Hospital Admission	19 (24)	247 (17)	.11

Note: p-values calculated using  $\chi^2$  for categorical variables and independent sample t-tests for continuous variables

## Sample Characteristics of Most Common Psychology Consultations

Characteristics	Reason for Rehab Psychology Consult		$p$
	Emotional Distress (N=44) n (%) or $\bar{x} \pm SD$	Rehab Engagement (N=19) n (%) or $\bar{x} \pm SD$	
Woman	28 (64)	5 (26)	.01
Race			.25
White	26 (59)	9 (47)	
Black	15 (34)	10 (53)	
Other	3 (7)	0	
Age (years)	56 $\pm$ 12	57 $\pm$ 17	.21
Marital Status			.29
Married	29 (67)	8 (42)	
Single	11 (26)	9 (47)	
Divorced	2 (5)	1 (5)	
Widowed	1 (2)	1 (5)	
Total MICU Length of Stay (days)	12 $\pm$ 9	12 $\pm$ 11	.42
MICU Day at Rehabilitation Psychology Consult (days)	8 $\pm$ 5	8 $\pm$ 7	.08

Note: p-values calculated using  $\chi^2$  for categorical variables and independent sample t-tests for continuous variables

## Role of Psychologists in Critical Care Survivorship

Critical Care Guideline Recommendation*	Example of Psychology Intervention
Minimize Sedation/ Avoid Benzodiazepines	Non-pharmacological, cognitive-behavioral strategies for improved self-management of emotional distress and pain
Early Rehabilitation	Motivational Interviewing for engagement in rehabilitation
Screen for Delirium	Neurocognitive evaluation; recommendations for environmental and non-pharmacological management
Family and Patient Support	Education about ICU environment; psychological support
Inter-disciplinary Teamwork	Co-treat with ICU clinicians; help team maintain holistic/biopsychosocial view of the patient and family

\*(Devin et al., 2018)

## Conclusions

- Longer stays increase likelihood of psychological consultation
- Consultations are typically for:
  - emotional distress
  - barriers to rehabilitation engagement
- Based on nature of consultations, the following skills are essential for psychologists working in an intensive care setting:
  - knowledge of brief and adapted interventions for emotional distress associated with hospitalization
  - familiarity with neurocognitive disorders and the assessment of cognitive impairment (e.g., delirium)
  - skills to facilitate engagement in rehabilitation interventions



# Implementation of a CVICU Family Diary

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## Clinical Issue and PICO Question

Family members of patients in intensive care units (ICUs) are at risk for adverse physiological and psychological symptoms, including anxiety, depression, post-traumatic stress disorder (PTSD) and grief. Receipt of inconsistent information leads to difficulty with decision-making and negatively affects satisfaction. Completeness of information has been shown to correlate with satisfaction.

The project sought to answer the question:

**(P) For family members of patients in the cardiovascular intensive care unit**

**(I) how does the use of an intensive care unit diary**

**(C) compare to the standard of care (non-standardized communication with nurses and physicians)**

**(O) and affect family member satisfaction with information provided by CVICU nurses and physicians at discharge from the CVICU?**

## Discovery

- Literature review using Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline Plus, and Google Scholar to locate English-language, full text articles.
- Key words and phrases: family needs, critical care, ICU, intensive care, family support, family satisfaction, post-intensive care syndrome, psychological symptoms, communication, intensive care diary, and ICU diary.
- Analysis of the literature used the research and non-research appraisal tools provided in the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model.



## Critical Appraisal & Evidence Summary

**3 qualitative, 5 quantitative, and 5 mixed methods studies of ICU diaries were identified in the literature.**

**Diary outcomes for families included:**

- **Promoted feeling in contact with patient**
- **Improved communication with staff**
- **Improved communication among family members**
- **Decreased sharing of emotions in difficult relationships**
- **Provided insight into patient's situation**
- **Allowed expression of feelings**
- **Reduced anxiety and PTSD symptoms**

## Translation

- **A convenience sample of family members of patients were alternately assigned to one of two groups.**
- **Family members in the intervention group received a spiral-bound notebook with written suggestions for use.**
- **Family members in the control group did not receive a spiral-bound notebook.**

## Integration

- **Qualitative and quantitative studies of ICU diaries and published EBP projects have reported the impact of a diary for both patients and family members.**
- **Limited samples sizes and variability in instruments used and outcomes measured indicated a need for additional research and EBP projects.**

## Evaluation

- **At the time of discharge from the CVICU, participants in both groups completed the demographic questionnaire and decision-making subscale (FS-ICU/DM) of the Family Satisfaction with Care in the Intensive Care Unit® survey (FS-ICU(24)). Family members in the intervention group also completed a 4-item questionnaire about the use of the ICU diary.**

**70 family members: 35 in each group**

**No significant differences between groups for gender, age, relationship to patient, previous ICU experience**

**Difference between control, intervention group significant for**

▪ **Adequate time - decision making  $p = .022$**

**Difference between control, intervention group approached significance for**

▪ **Frequency of MD communication  $p = .149$**

▪ **Ease of getting information  $p = .152$**

▪ **Overall score (10 items combined)  $p = .129$**

▪ **81% of intervention group participants recommended diary**

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## Acknowledgements

- **With gratitude to Patricia Connor-Ballard PhD, RN; Nancy Steffan PhD, RN; Michelle Roa PhD, RN; and the staff and leadership of the CVICU.**





# Addressing Post-Intensive Care Syndrome Through Implementation of ICU Diaries and Support Groups

KELLY DRUMRIGHT MSN, RN, CNL; LEANNE BOEHM, PhD, RN, ACNS-BC; ROBIN MICKELSON, PhD, RN

## Background

- **Post-Intensive Care Syndrome (PICS)** consists of multidimensional cognitive, physical, and mental health impairments occurring in the months to years following critical illness.
- **PICS-Family (PICS-F)** is the cluster of anxiety and depressive complications experienced by family members of ICU survivors.
- ICU diaries and peer support group programs can reduce symptoms of psychological distress in ICU survivors and their families.

## Aims

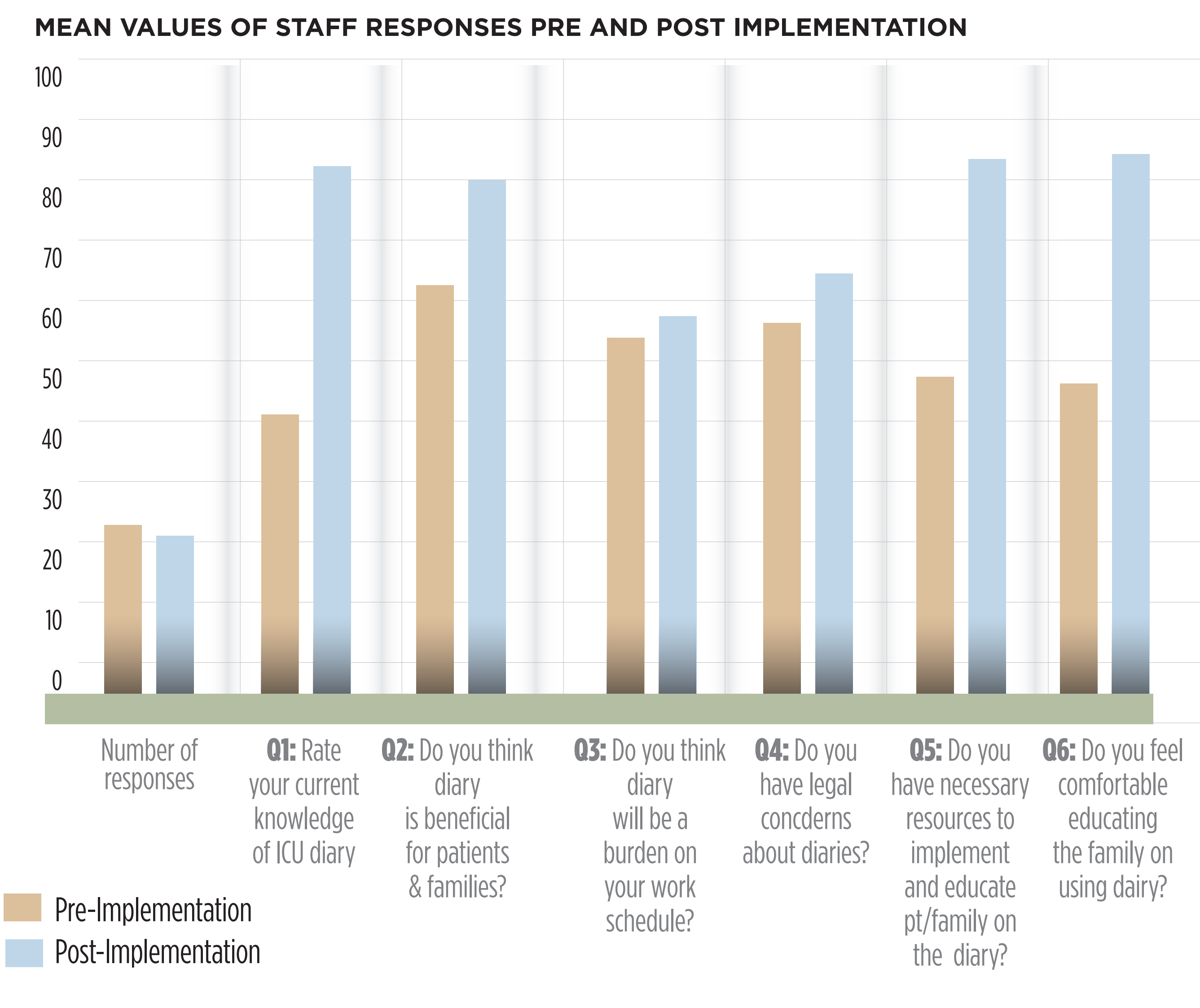
- 1 Implement ICU diaries and peer support groups for patients and family members who are currently experiencing or have experienced critical illness.
- 2 Improve the recovery of critical care survivors and accelerate the progress of knowledge about recovery for both patients and family members.
- 3 Reduce negative perceptions of ICU diaries by staff (i.e. increased workload and stress, legal concerns, lack of benefit).

## Methods

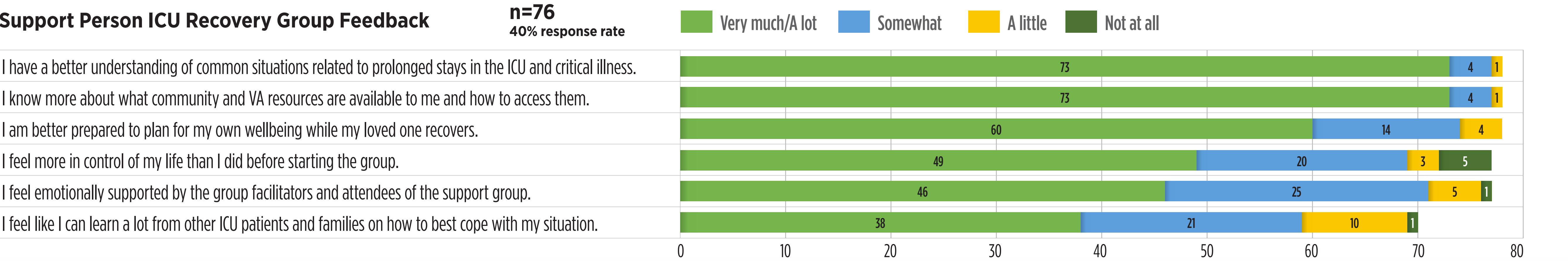
- Nashville VA Medical Center participates in the multi-site THRIVE Collaborative
- Formed interprofessional core team to rollout ICU diaries in conjunction with peer support group meetings.
- Constructed detailed implementation plan guided by IHI Model for Improvement
- **ICU diaries:**
  - initiated for patients at high risk for PICS
  - entries encouraged by all ICU disciplines and family members
  - 1:1 implementation coaching
  - surveyed ICU nurses regarding perceptions
- **Peer support groups:**
  - sessions offered once weekly
  - open to patients, family members, and ICU survivors
  - encourage staff attendance

## Findings

- ICU Diaries:**
- n=66 initiated since January 2017
  - Staff perceived barriers: physician buy-in, legal concerns, comfort in writing, interrupted workflow
  - Reported benefits: increased family engagement, enhanced communication, providing hospitalization frame of reference



- Support Groups:**
- n=66 ICU Recovery Group sessions
  - Positive views reported via anonymous evaluation
    - 93% learned from others
    - 93% felt emotionally supported
    - 76% understand common situations related to prolonged ICU stay
    - 87% would strongly recommend recovery group to a friend
    - 45% interested in volunteering to support others



## Conclusions

- ICU Recovery Group helpful in increasing ICU survivor and family member support.
- Ideal participant number is 4-6 per session.
- Group participation not inhibited with attendance of both ICU survivor and family members/friends.
- Diaries enhanced communication between Veterans, families, and providers.
- Legal concerns and lack of time remain perceived barriers by some staff in engaging in diary writing.

## Next Steps

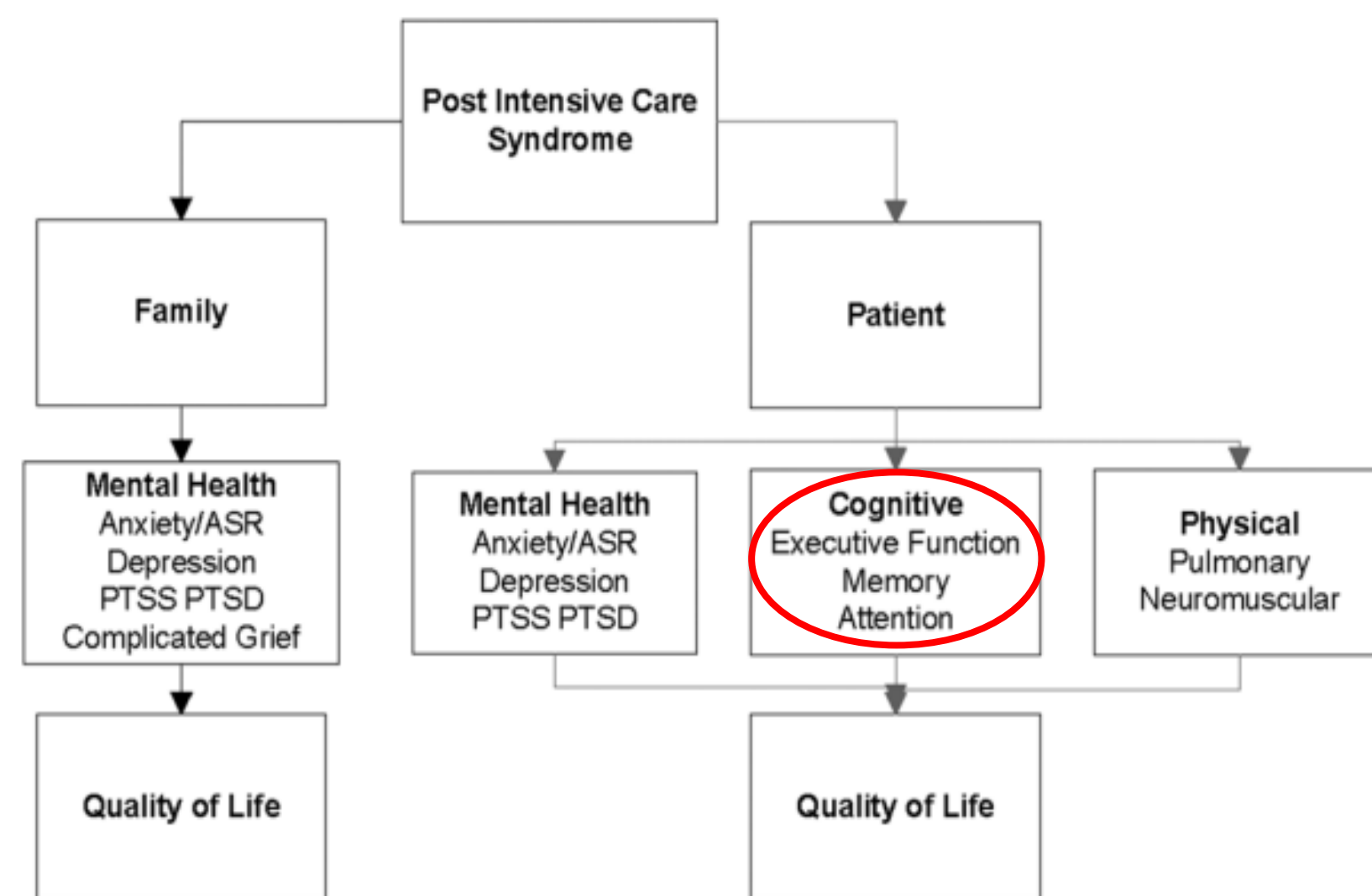
- Conduct PDSA cycles to enhance participation by ICU patients who have survived critical illness in peer support groups, and to increase participation by non-nurse providers with writing in ICU diaries.
- Conduct study to evaluate the use of ICU diaries by critical illness survivors and their families, analyze the fit of the ICU diary to support psychological recovery, and identify recommendations to optimize the ICU diary intervention.
- Conduct research to determine effectiveness of ICU support group in influencing morbidities associated with PICS and PICS-F.



# Measurement & Rehabilitation of Cognitive Dysfunction in the Critical Illness Recovery Hospital Setting

Beth Courtright, M.Ed., CCP-SLP; Amanda Dawson, PhD; Beth Sarfaty, PT, MBA; Tessa Terwilliger, RN; Samuel Hammerman, MD  
*Select Medical, Critical Illness Recovery Hospital Division*

## INTRODUCTION



- Cognitive rehabilitation programs (CRP) have been relatively unaddressed despite a high incidence of cognitive dysfunction in the ICU and deleterious long-term consequences.
- Evidence from successful CRPs with stroke and TBI patients suggests frequent and consistent therapy over a long-time course.
- Based on the recovery trajectory, post-ICU venues may be better suited to implement CRPs.
- For example, Critical Illness Recovery Hospital patients are admitted from the ICU, have an average length of stay of 25 days and are treated by on-staff OTs, PTs, and SLPs.

- 3-month pilot in 4 Critical Illness Recovery Hospitals.
- SLP-driven assessments and treatment plans:
  - Low-level: meets CRS-R assessment criteria
  - Mid-level: MoCA score  $\leq 17$
  - High-level: MoCA score 18-25
- Tx by SLPs 3x weekly, 15-30" or as tolerated; and by RN or family 15" min BID

### Inclusion

ICU stay  
Dx of ARF, sepsis, cardiogenic disorder, or encephalopathy

### Exclusion/Discontinuation

MoCA 26/30  
MoCA-Blind 18/22  
Continuous sedating drips  
Continuous BiPap use

## METHODS

Tool	Purpose	Frequency
MoCA/MoCA-Blind	Est. baseline cognitive level & develop treatment plan Track progress Readiness to discontinue	Initial & Weekly
Coma Recovery Scale - Revised (CRS-R)	Est. baseline cognitive level & develop treatment plan Track progress Readiness to move to MoCA	Use when LOC too low for MoCA, re-assess with sessions
HADS	Depression and Anxiety	Admit/DC
EQ-5D 3L (EuroQol)	Quality of Life	Admit/DC
G-codes	Attention & Memory progress	Admit/DC/every 5 <sup>th</sup> visit

Cognitive Rehab Program Exercise Program: Mid Cognitive Level

☐ Short Term Memory ☐ Frequency: \_\_\_\_\_

☐ Activity Log: When in the room with the patient write the activity in the log.

☐ Ask yes/no questions regarding entries. Ex: "Did you have therapy today?" Did the nursing staff bathe you today?" If the patient can read, have the patient read the entries to recall information. Ask questions regarding what is in the log.

☐ Point to 1-2 objects in the room and name them. Ask the patient to remember the objects and recall them after 30 seconds to 1 minute.

☐ Long Term Memory ☐ Frequency: \_\_\_\_\_

☐ Ask yes/no questions or give choice answers regarding long term memory. Ex: Did your work for Chrysler?" or "Did you work for Chrysler or Ford?"

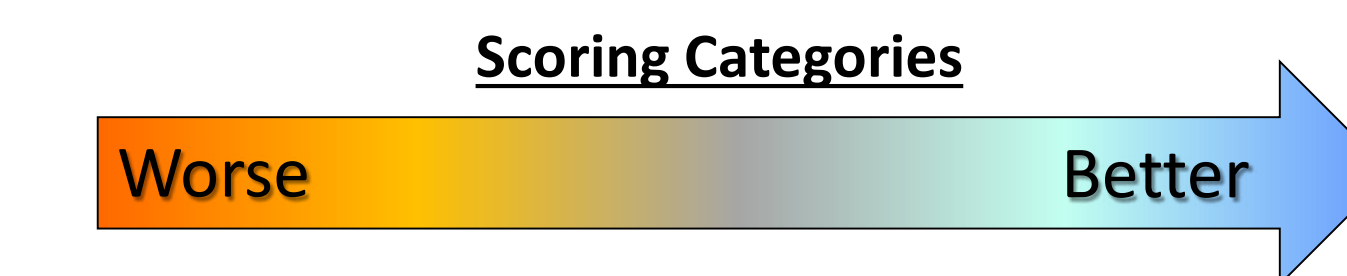
☐ Problem Solving ☐ Frequency: \_\_\_\_\_

☐ Show patient the call light and have them practice pushing it.

☐ Ask yes/no questions: "Are you allowed to get up and use the bathroom?"

☐ "What should you do if you need help?" (push the call light and have them demonstrate it)

## APPROACH FEASIBILITY ANALYSIS

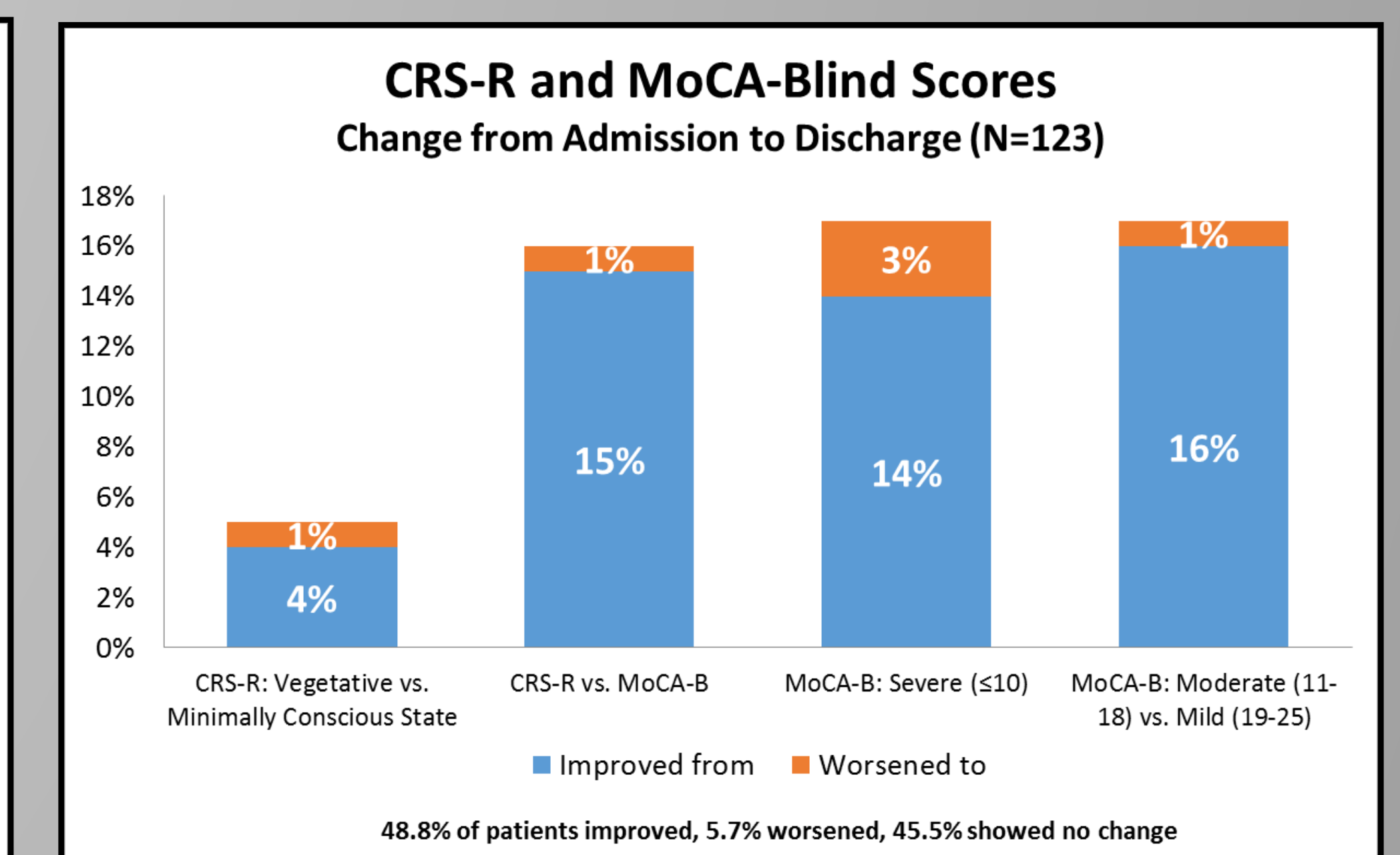
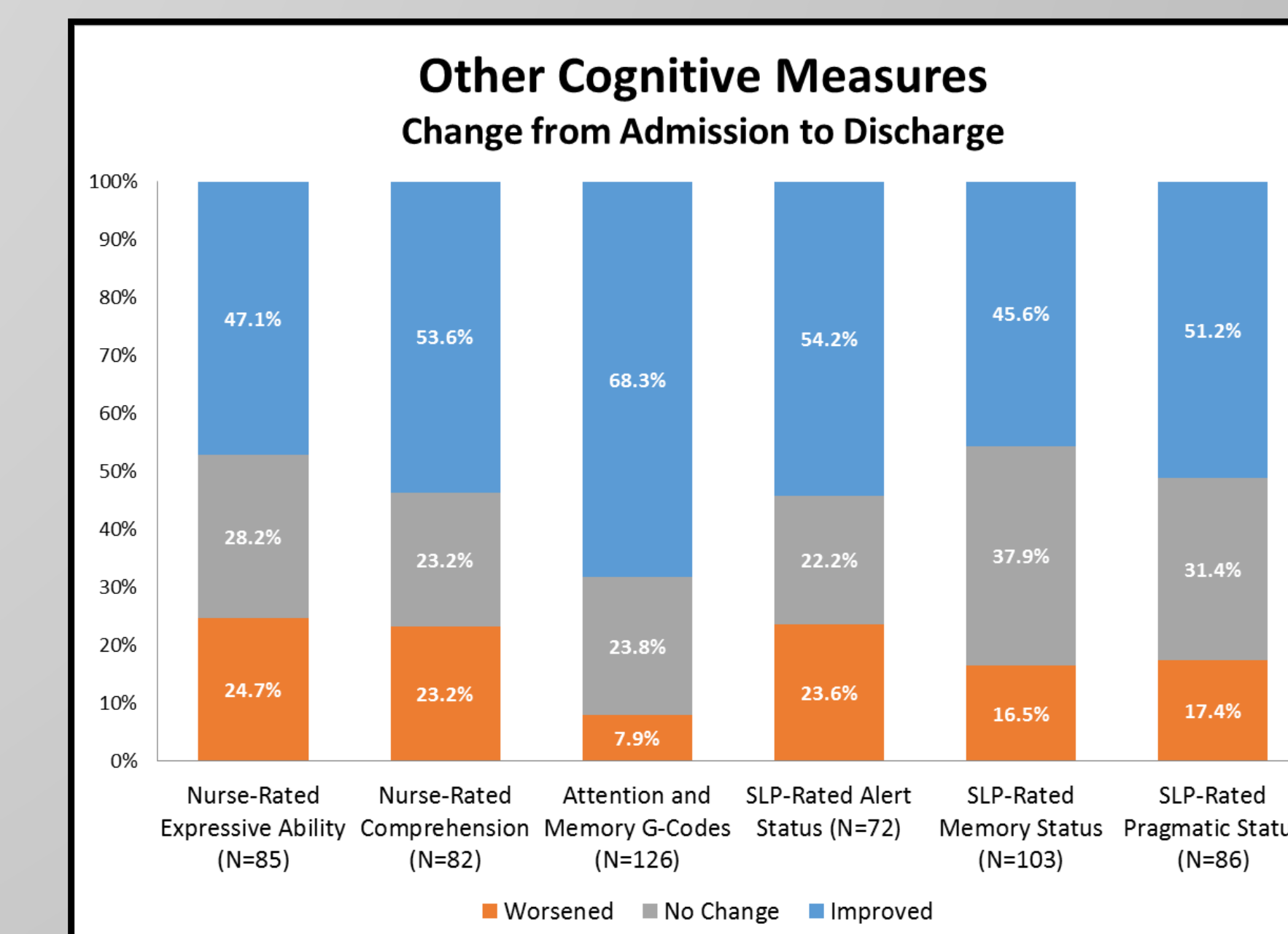
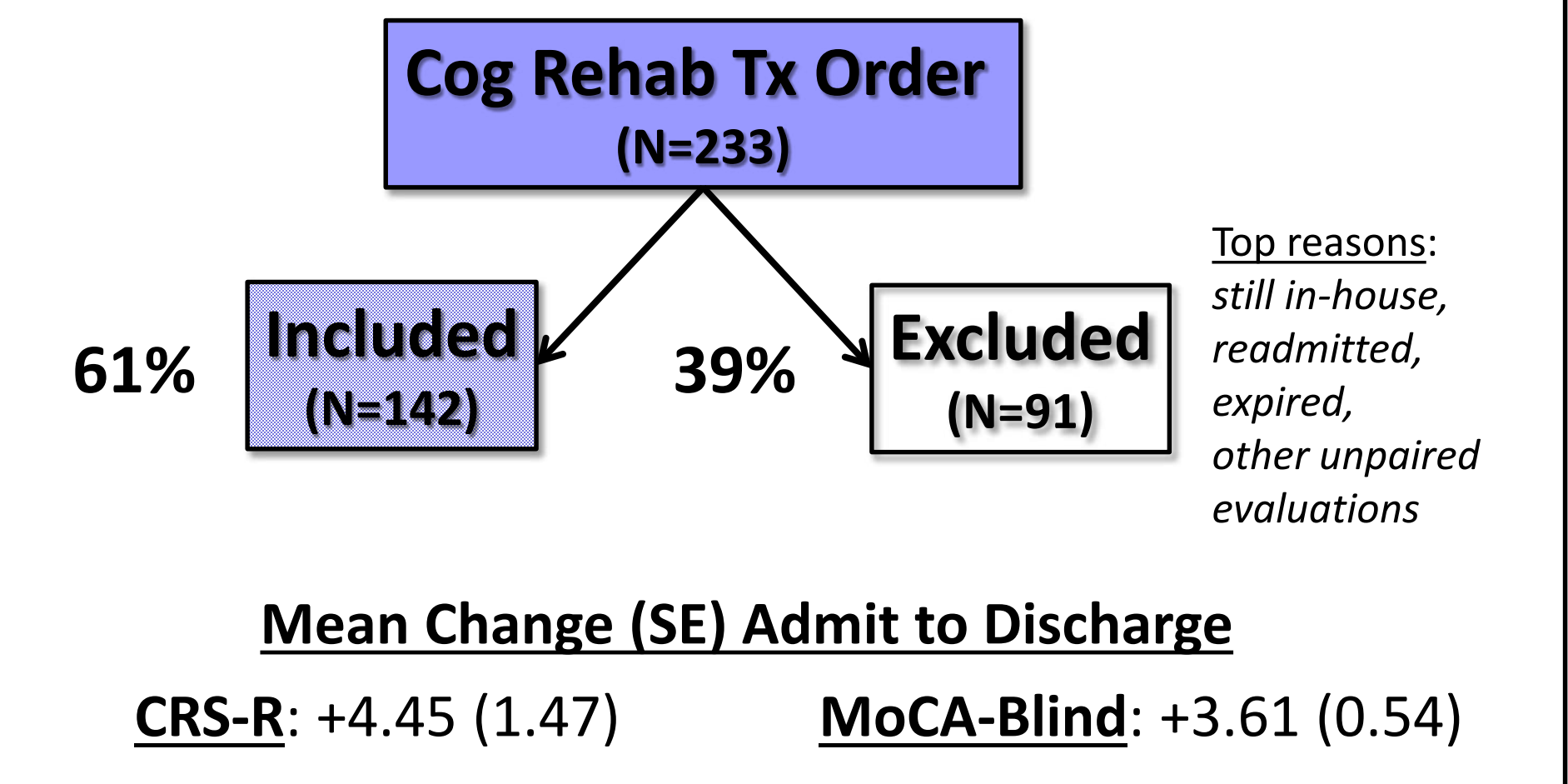


**Nurse-rated Expression:**  
Rarely/Never, Difficulty, Frequently, Without Difficulty

**Nurse-Rated Comprehension:**  
Rarely/Never, Sometimes, Usually, Understands

**G-code Severity Modifiers (impaired, limited or restricted):**  
100%, 80-100%, 60-80%, 40-60%, 20-40%, 1-20%, 0%

**SLP-Rated Level of Assistance:** Dependent, Max, Mod, Min, Supervised, Modified Independent, Independent

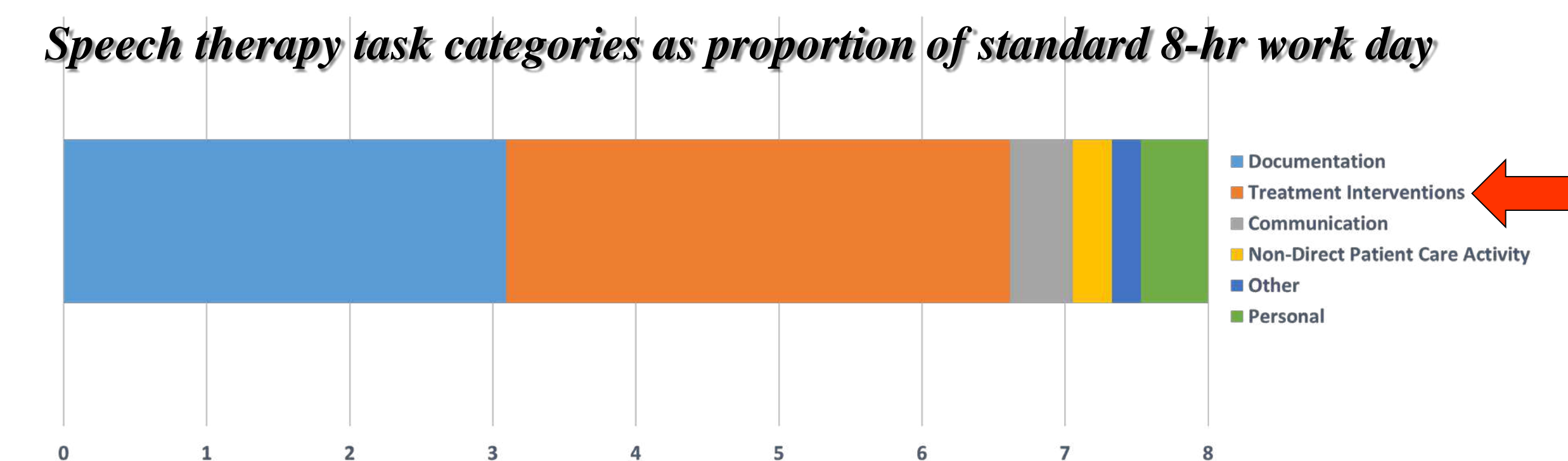
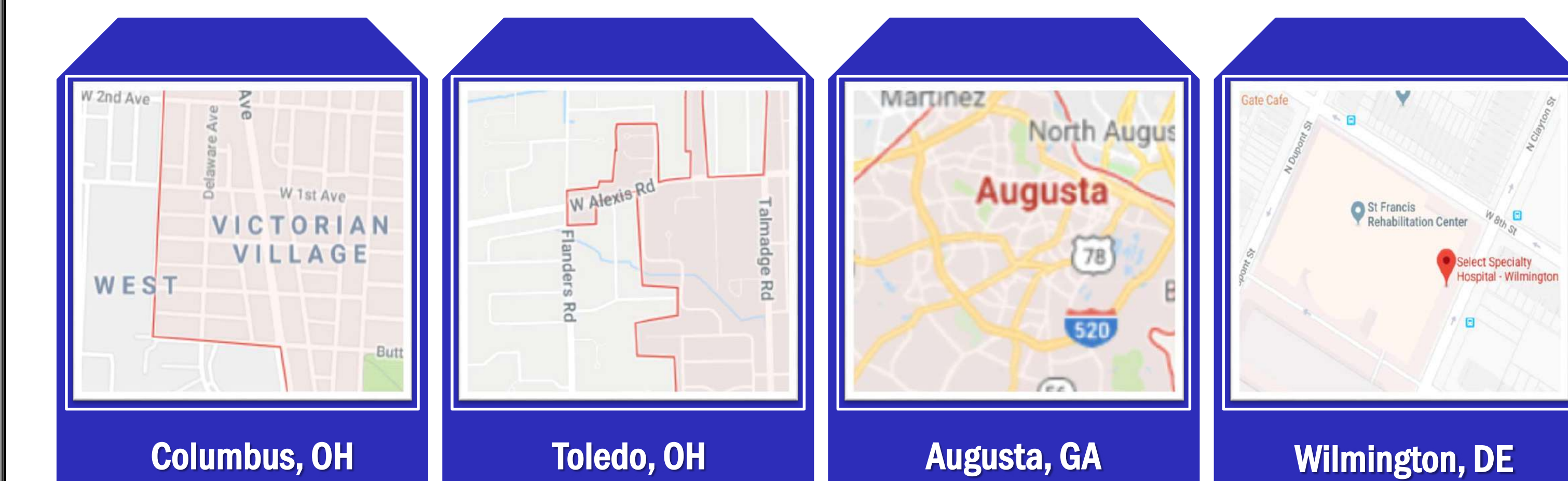
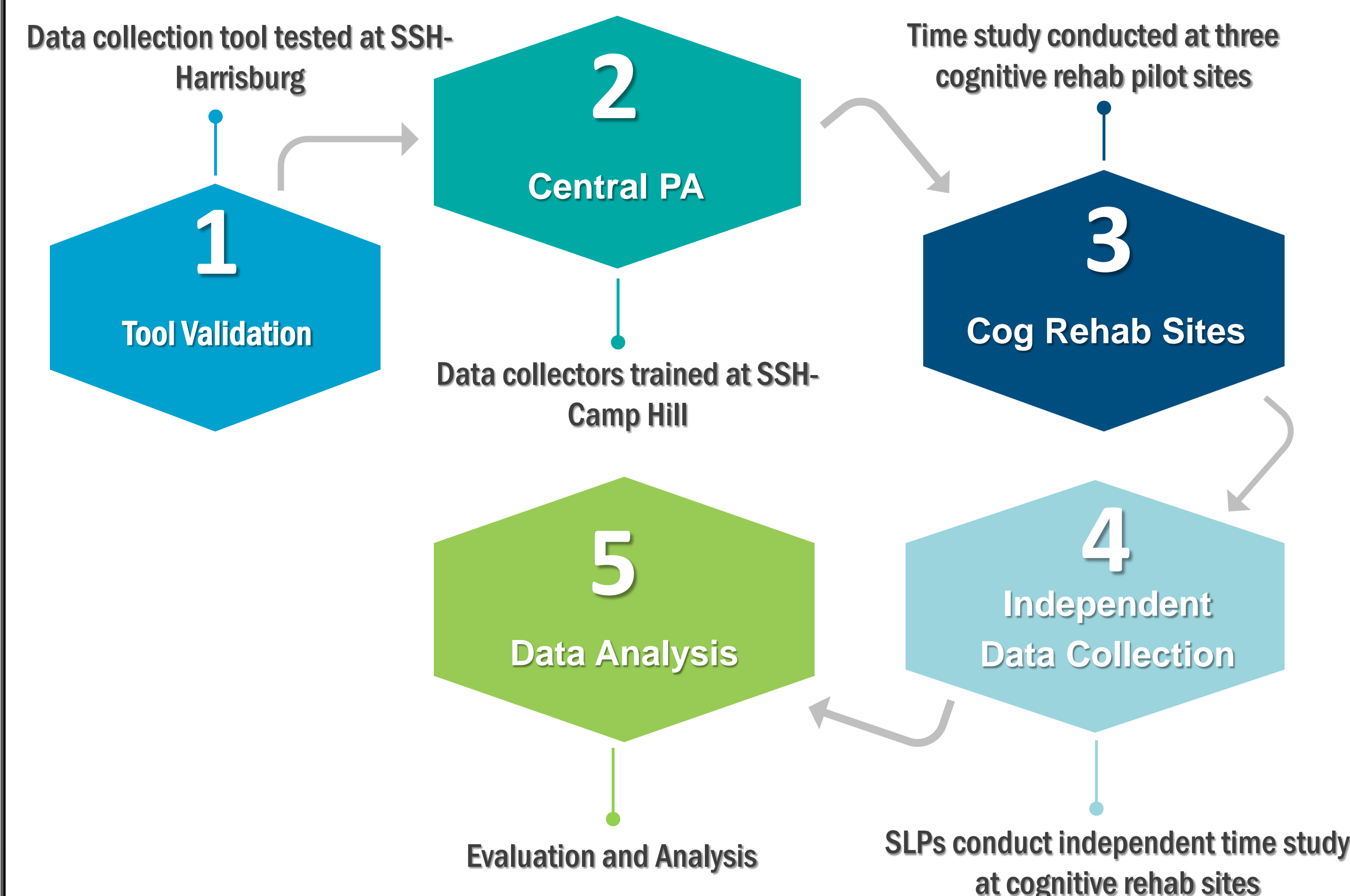


## CONCLUSIONS

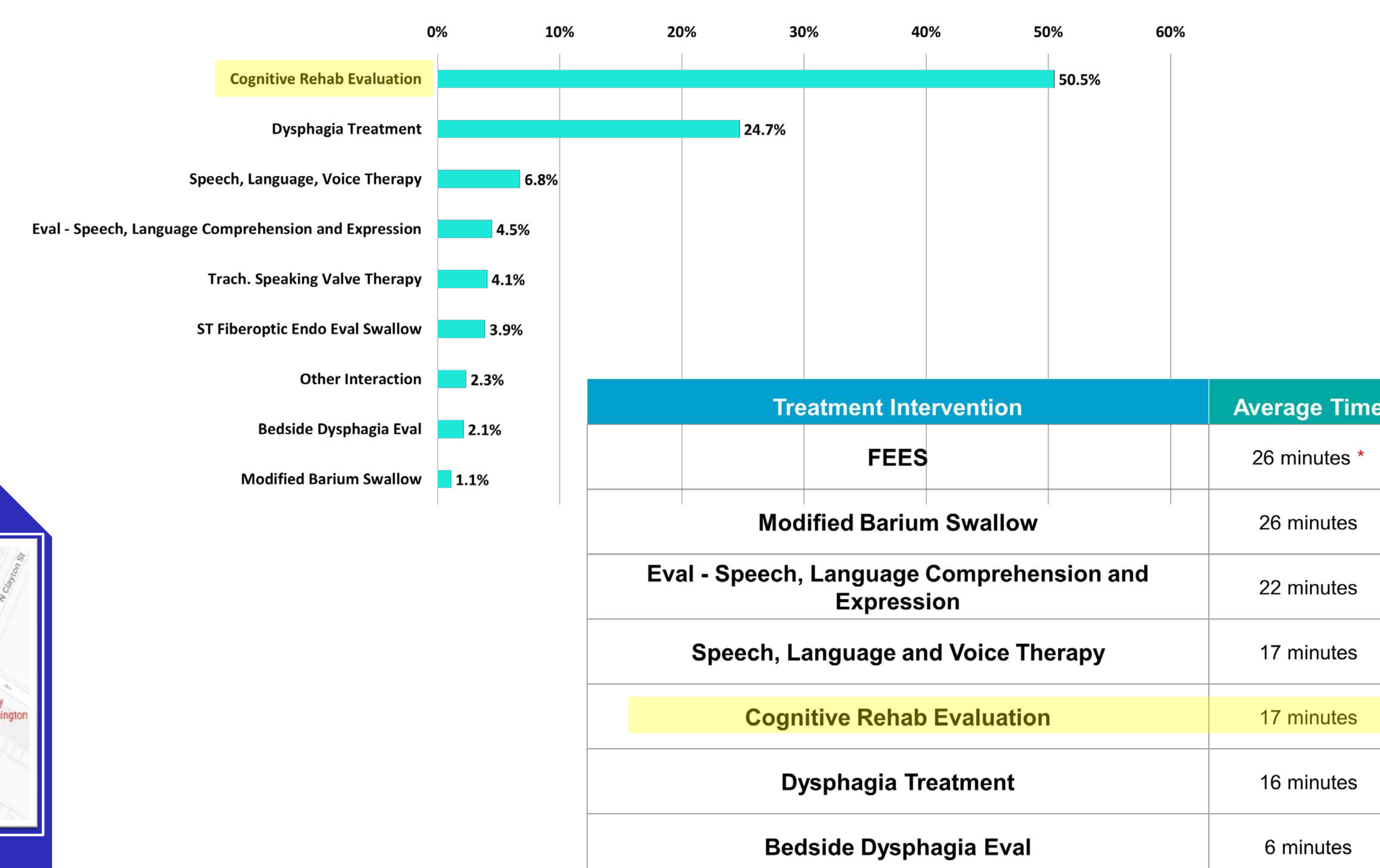
- A cognitive rehabilitation program is feasible in the critical illness recovery hospital setting:
- Evaluation and treatment time may require additional FTEs.
  - Selected cognitive assessments:
    - were sensitive to recovery during the episode of care.
    - exhibited concurrent validity.

Further comparisons are required to attribute demonstrated improvements to a cognitive rehabilitation program, i.e., CRP treated vs. usual care (control) patients.

## IMPLEMENTATION FEASIBILITY ANALYSIS



### Treatment Interventions (137 hours, 46% of total time)



Cr: Dr. Tony Grigoris, George Arthur, Erica Hill

\* Does not include retrieval or clean up.

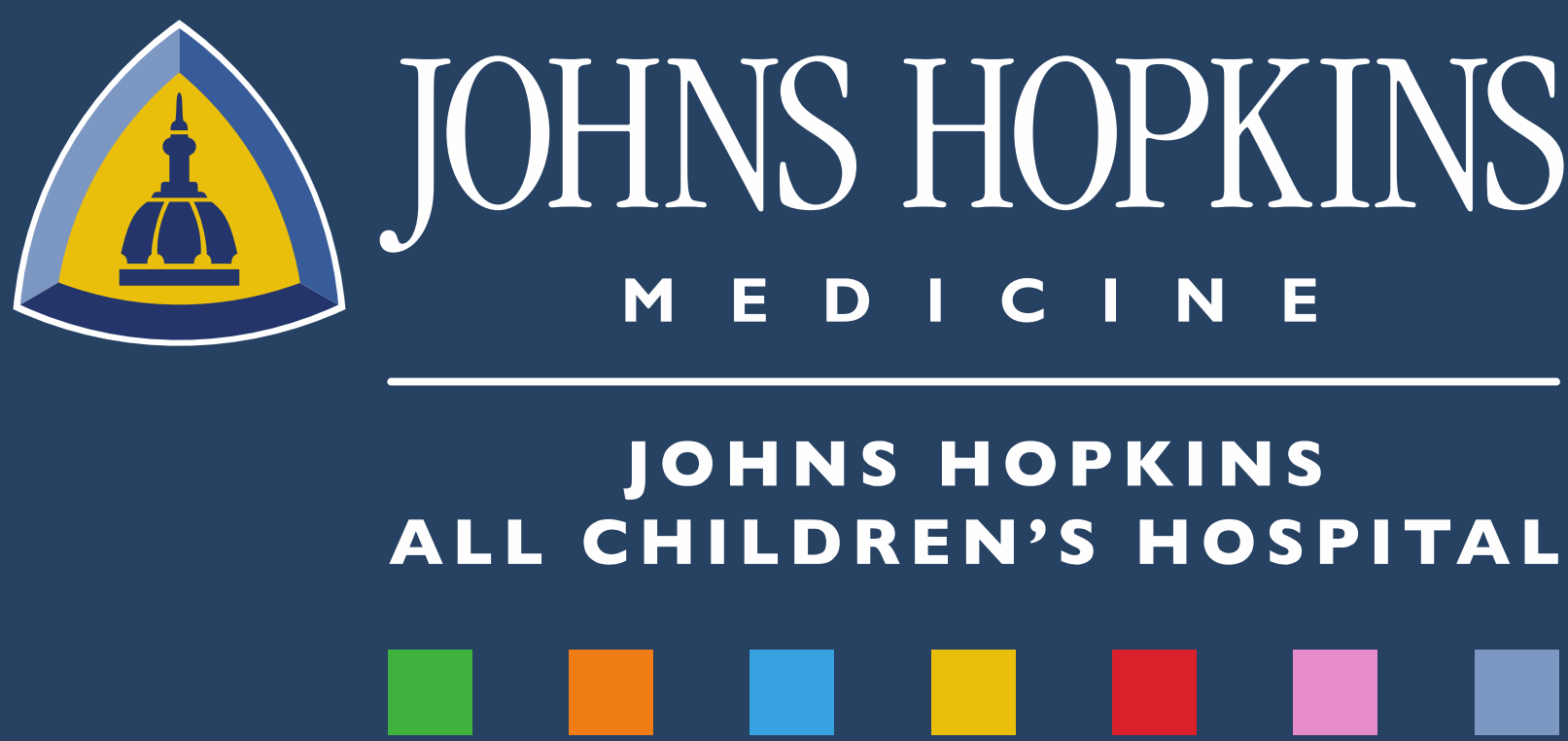
All co-authors are Select Medical employees with no financial or personal relationship with commercial entities. This QI initiative was possible thanks to the efforts of our therapists: Dr. Vijay Malaichamy, Avery Borchers, Julia Menke, Taylor Nicholson, Camille Scipin, Emily Simmons, Susan Verner, Allison Webb, Laura Winters, Brandon Schimmel, Cherie Trebisky, Emily Wead, Michele Friedman, Abby Gerlach, Laura Kelson, Lindsey Parks, Kristina Williams, Kristel Carroll, Carleen Gelofoack, Ruchita Rao, Suzanne Arroyo, Christiane Dorneus, Maryann Campbell, Pamela Joyner, and Anthony Ventura, Carrie Stant and Heather Despres-Cook.



# Early Mobility of a Mechanically Ventilated Pediatric Patient with Complex Medical History: A Case Report

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## Objectives

- Demonstrate the importance of early mobilization for mechanically ventilated patients.
- Show how early mobilization in the PICU improves outcomes and reduces deconditioning.
- Highlight the effectiveness of a multi-disciplinary collaboration for early mobilization in the PICU.

## Case Description

The patient is a 10 year old female who presents with complex medical history including heart transplant as an infant, sickle cell trait, and spondylosis. Patient was recently diagnosed with compression fractures at T5, T7-8, and T10-12 for which she was provided with a TLSO and no surgical intervention was required. She was originally admitted to the PICU for intractable pain and a “popping” sensation in her low back and hips while wearing her TLSO. On day 14 of 61 of this admission her respiratory distress worsened leading to respiratory failure and intubation.



## Therapy Interventions

The patient was initially progressing well with bed mobility and increasing ambulation distance as pain complaints decreased (100 feet with hand held assist). Following intubation she was weaned from sedation as tolerated and remained alert and oriented. Patient was intubated for a total of seven days. Over the course of four days, prior to extubation, the patient participated in increasing mobility skills. For all mobility skills while intubated, respiratory therapist was present and monitoring ET tube/airway throughout therapy session.

Early Mobility Day #	Activities Performed
Day 1	<ul style="list-style-type: none"><li>• Head of bed elevated to 40 degrees for 20 minutes</li><li>• Resisted lower extremity exercise in bed</li><li>• Fine motor play including painting</li></ul>
Day 2	<ul style="list-style-type: none"><li>• Log rolling for donning of TLSO with mod assist</li><li>• Sidelying to sitting transition with max assist x2</li><li>• Sitting edge of bed for 35 minutes with min assist for upright posture</li><li>• Lower extremity active range of motion; long arc quad and ankle pumps</li><li>• Fine motor play including reaching for items on tray table</li></ul>
Day 3	<ul style="list-style-type: none"><li>• Log rolling for donning of TLSO with min assist</li><li>• Sidelying to sitting transition with max assist x2</li><li>• Sit to stand x2 with mod assist</li><li>• Pivot transfer to wheelchair with contact guard assist and verbal cueing for hand placement</li><li>• Sat out of bed for 1 hour while performing various upper extremity activities</li></ul>
Day 4	<ul style="list-style-type: none"><li>• Log rolling for donning of TLSO with min assist</li><li>• Sidelying to sitting transition with mod assist x1</li><li>• Sit to stand x2 with mod assist</li><li>• Ambulated 20 feet x2 with contact guard assist x2 (PT, OT), RN x2 to manage lines and IV pole, RT x2 to manage ET tube and ventilator</li><li>• Sat in wheelchair for 45 minutes and participated in fine motor activities including coloring and stringing beads</li></ul>

## Results

Due to the patient’s continued mobility and participation in functional activities while mechanically ventilated, she was able to maintain strength and reduce the effects of deconditioning that are commonly associated with intubation. Her initial pain and cause of compression fractures is suspected to be due to decreased bone density from prolonged use of steroids for her underlying heart disease. With the rapport built from day one of this admission, the patient displayed trust in the therapists to assist in mobility skills while intubated. This allowed for increased participation with requested in and out of bed activities. Following extubation she continued to improve toward independent mobility. This includes ambulating 200 feet two days post-extubation with contact guard assist.

## Conclusion

This case report reveals the benefits of early mobilization of a mechanically ventilated patient in the pediatric intensive care unit. There is currently limited evidence in the pediatric population for the benefits of early mobilization. A systematic review performed by Wiecezorek et al., discusses benefits of early mobilization as reported in six studies.<sup>1</sup> These studies reported improved outcome measures and decreased length of stay for the individuals participating in early rehabilitation.<sup>1</sup> They also concluded that these programs are safe and feasible.<sup>1</sup> Further research is required due to the small sample sizes from these studies and lack of overall available evidence for early mobilization with pediatric patients. Several factors have allowed for the initiation of an early mobilization program at Johns Hopkins All Children’s Hospital. These include a change in PICU culture, early identification of therapy needs/benefits, and the availability of necessary resources.

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# The "Healingwalks" Project

## (The critical patient in contact with nature)

Igeño Cano JC (MD), Sánchez Silos FM (MD), Bermejo Gómez A (MD)  
Intensive Medicine and Care Unit. San Juan de Dios Hospital. Córdoba (Spain)

Use your phone camera to...

Link to video:  
ICU Patients doing  
"Healingwalks"



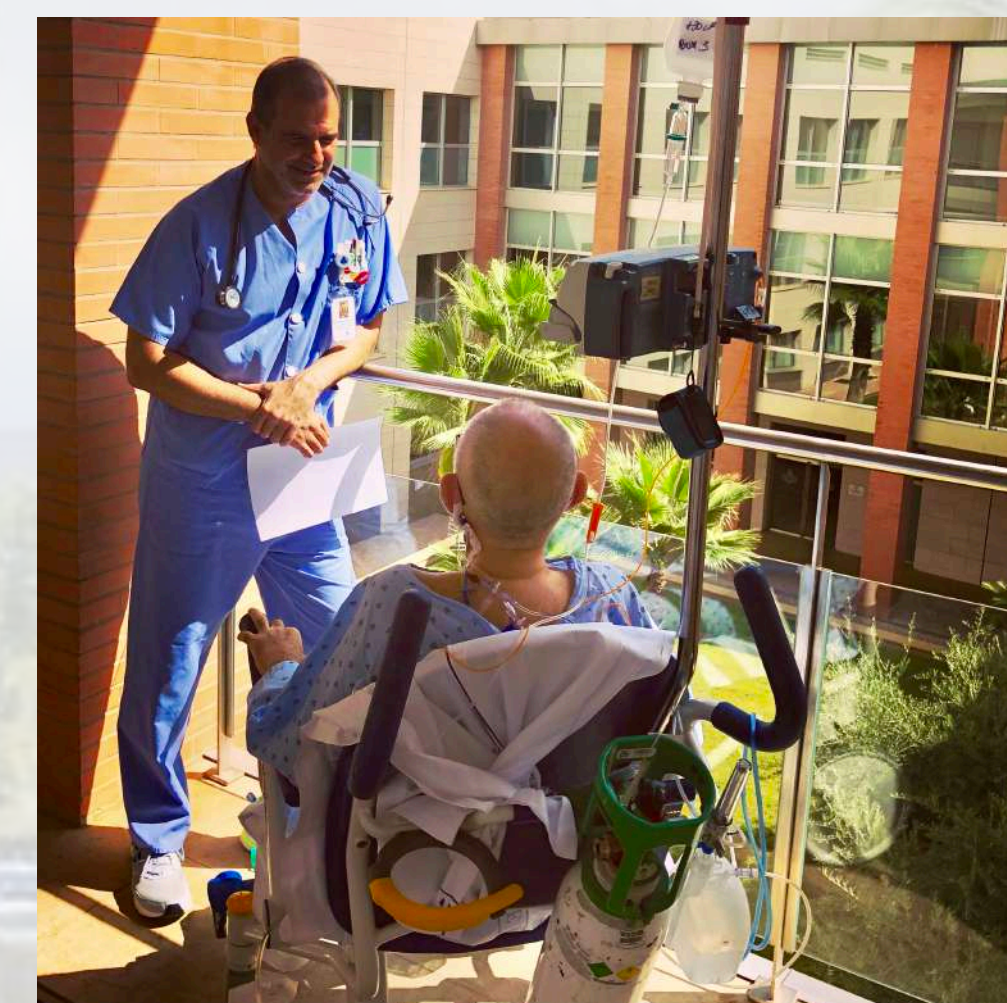
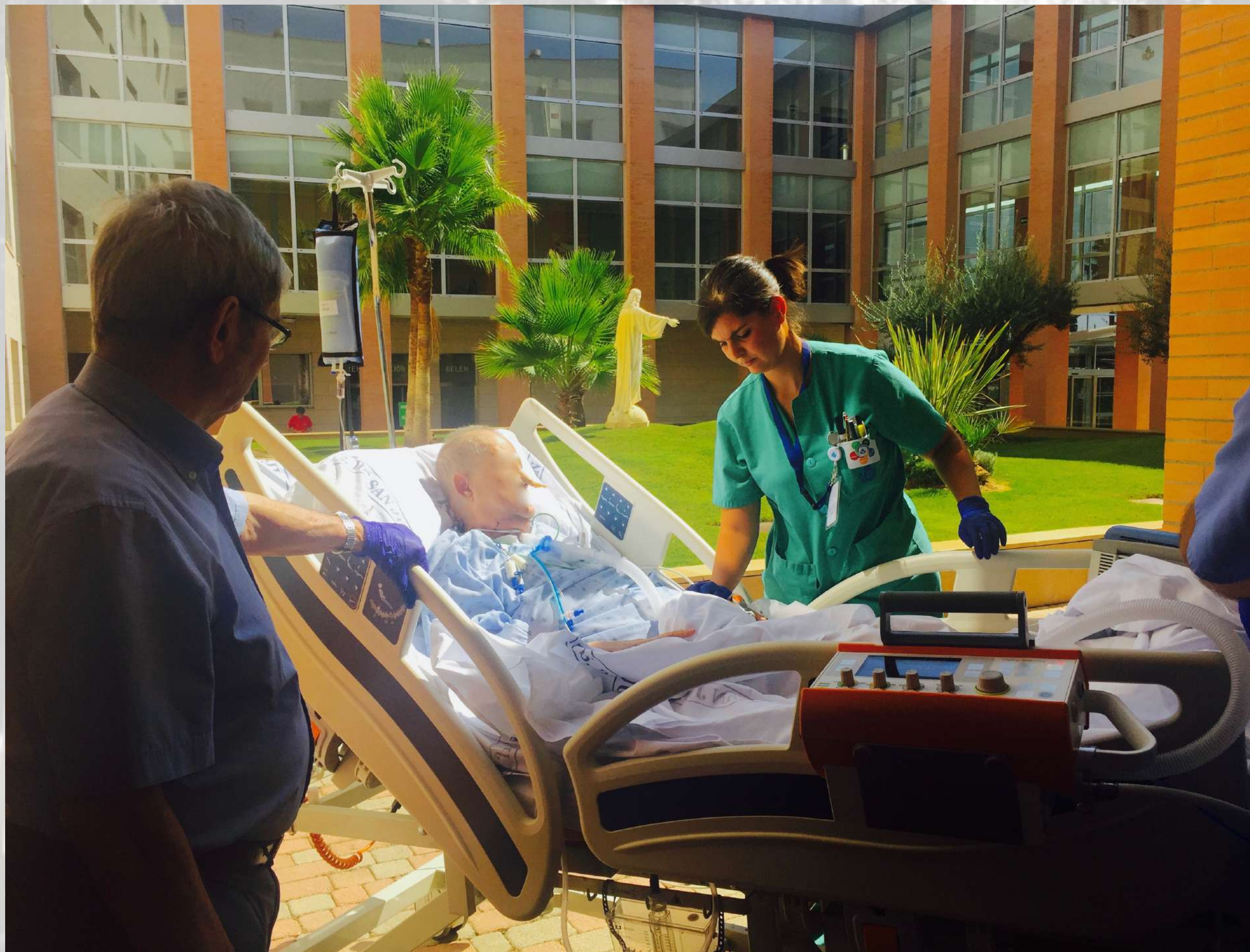
Link to:  
"Healingwalks"  
Protocol



*Admission to the ICU implies the loss of daily contact with nature and its benefits, and to stay inside a room for days isolated from the outside. This is an unnatural situation for the human being.*

### OBJETIVES

- Develop a program that incorporates as another treatment and care, walks in bed or chair to critical patients, around gardens and terraces, to get in touch with nature (sky, sun, fresh air and vegetation) continuing monitoring, surveillance and care outside the ICU.
- Promote in this way, an improvement of the well-being and the state of mind of patients, families and professionals of the ICU.



### RESULTS

- Implementation of the project and the Protocol "Healingwalks" with more than 400 walks since its inception.
- Reproduction of the project in others ICU in Spain and South America.
- Inclusion in the book: "Humanizando los Cuidados Intensivos" (Humanizing Intensive Care), Heras G, ed.
- A clinical study has been designed and initiated to investigate its influence on different variables.



### METHODS

- 4 years ago: Bibliographic review about "Physical and/or psychological benefits of nature on healthy and sick people".
- Design of the "Healingwalks" Protocol. Inclusion in the daily care checklist of each patient (individual assessment of the favorable benefit / safety profile) and in the System of Daily Transfer of Clinical Information.
- Promotion on <http://www.proyectohuci.com/> about this ICU project. Also in national TV, national press media and social networks.



### CONCLUSIONS

Although we have observed beneficial effects and collected very positive opinions from patients and relatives, we still cannot establish clear conclusions in this regard, pending the results of our study, which aims to demonstrate the different benefits associated with this practice.

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# Physical Therapy Management of a Complex Cardiac Patient With Vocal Cord Paralysis



Katherine Traditi, PT, DPT  
NYU Langone Health

Physical Therapy  
RUSK REHABILITATION

## OBJECTIVES

- Mechanical Circulatory Support (MCS) devices function as a bridge to transplant or to a durable Ventricular Assist Device (VAD).
- Early mobility for patients in Intensive Care Units (ICUs) requiring MCS has been established as safe and feasible.
- Potential sequelae of critical illness and immobility includes proximal muscle weakness, respiratory muscle weakness, cognitive impairment, psychological impairment, reduced physical function, and decreased quality of life.
- Physical Therapy (PT) for patients on or post-MCS must include strengthening of anti-gravity leg muscles and postural stabilizers.
- The strength of postural muscles and patency of glottal structures maintain trunk stability and intrathoracic pressure (ITP).
- The strength of pelvic floor muscles plays a role in maintaining intra-abdominal pressure.
- Intensive PT for a medically complex patient with vocal cord paralysis and severe deconditioning facilitated a return to function and ambulation.

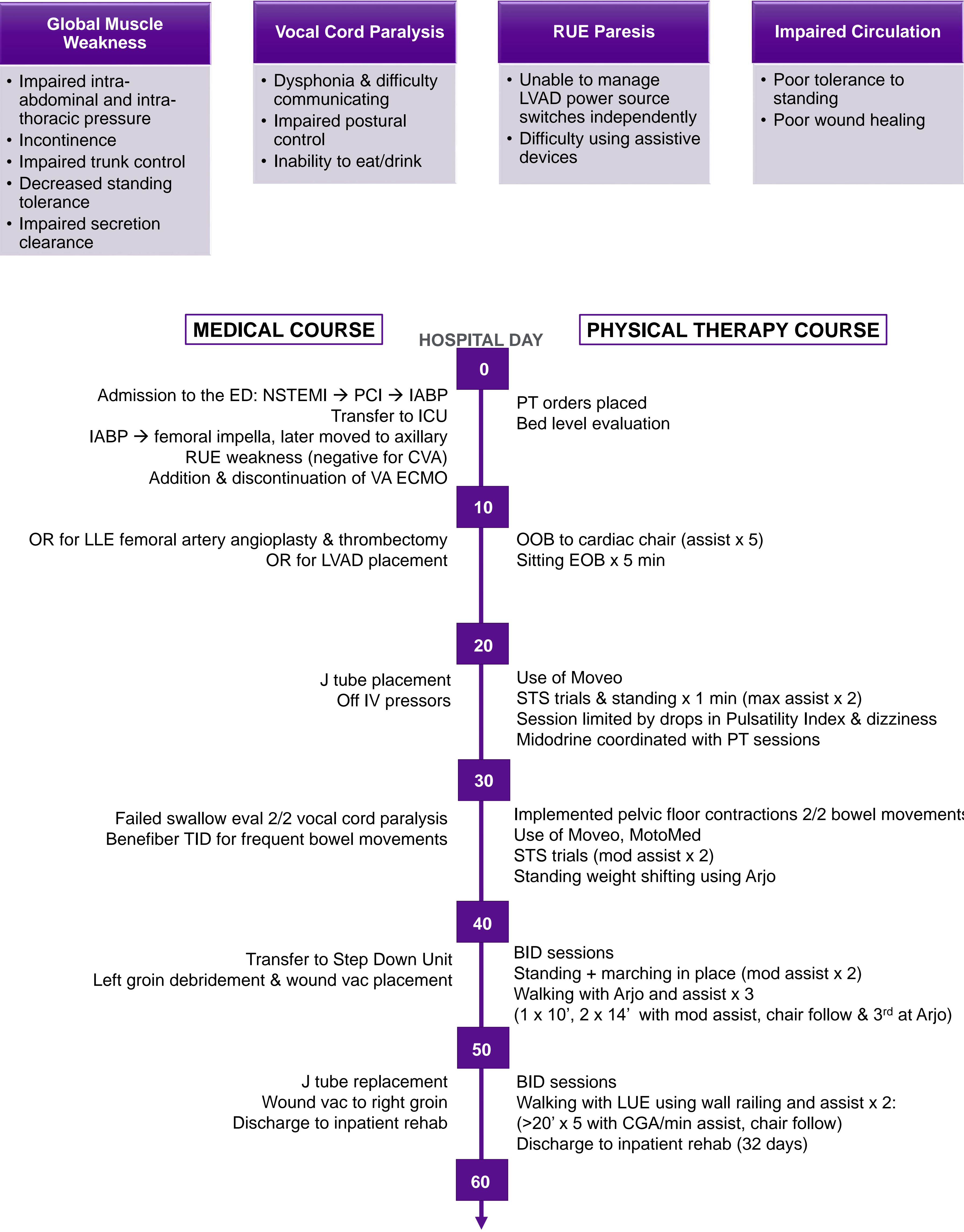
Postural Control Model Using a Soda Pop Can



## BACKGROUND & METHODS

- A 52-year-old woman presented to the emergency department with a myocardial infarction.
- Her past medical history included Diabetes Mellitus II, hypertension, legal blindness, neuropathy, and cellulitis.
- Over the course of a 60 day admission, she required multiple MCS devices and was ultimately transitioned to a durable left VAD.
- Her recovery was complicated by partial vocal cord paralysis (VCP) and profound deconditioning, which negatively affected her ability to attain and maintain standing.
- Lack of full glottal closure impaired maintenance of ITP which presented as impaired trunk control.
- Consequently, the patient developed stress incontinence from increasing her intra-abdominal pressure (IAP) for greater stability.

## PROBLEM LIST & TIMELINE



## RESULTS

- Initial acute care therapy focused on sitting balance, therapeutic exercise, and airway clearance. Pre-gait activities included a mobile leg press and leg ergometer.
- Instruction on pelvic floor contractions was given to mediate stress incontinence.
- This patient progressed from using a mechanical lift for all out of bed (OOB) mobility to performing stand pivot transfers with assistance, and from marching in place to ambulating with bilateral upper extremity (BUE) support with assistance.
- Ultimately, the patient transitioned to acute rehab, where she regained use of her voice and ambulated with close supervision at discharge.

## CONCLUSIONS

- Physical therapists educated themselves on the role of glottal structures in maintaining ITP and posture, as well as the relationship with IAP and continence.
- Use of alternate exercise devices enabled activation of lower extremity and pelvic floor muscles while increasing upright tolerance.
- Intensive PT facilitated functional gains and discharge to acute rehab.
- PT management of VCP with deconditioning was integral to this patient's return to function.

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