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 Mediastinl 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

    *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  
_Anna Maria Jara, PT, DPT_  
Affiliation: John Hopkins All Children's Hospital

_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

_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?

Sarah Shatto, MS, OTR/L
Ashley Hennen, PT, DPT
Daniel Vazquez, MD
Disclosures

We have no financial or other conflicts of interest to disclose.
What is an Open Abdomen?

(Martin & Sarani, 2018)

- “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

- Wittmann Patch: two sheets of Velcro®-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)
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

- 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

- 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

- 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

- 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

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

Evaluation and Progression of Activity

- 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

- 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

Activity with an Open Abdomen

<table>
<thead>
<tr>
<th>Level of Participation</th>
<th>Percentage of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performed ADLs</td>
<td>45.45%</td>
</tr>
<tr>
<td>OOB to Chair</td>
<td>27.27%</td>
</tr>
<tr>
<td>Standing</td>
<td>45.45%</td>
</tr>
<tr>
<td>EOB</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Discussion

- 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


Thank You

wexnermedical.osu.edu
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
Critical Illness

ICU admission

Post-Intensive Care Syndrome - Family

Anxiety
Depression
PTSD
Significance

- **Lifetime prevalence in general population**
  - Depression: 8-15%
  - PTSD: 6.8%

- **Long-term prevalence in ICU family caregivers**
  - Depression at 1yr post-ICU care: 23-43%
  - PTSD at 2 yr post-ICU care: 14%
The Facilitated Sensemaking Model (FSM)

Life disruptions during critical illness

Compensation period to overcome challenges in a new situation

Sensemaking process through nursing interventions

Adaptation lower adverse psychological outcomes

Sensemaking Intervention

**Goal 1.**
Make sense of what has happened

**Goal 2.**
Make sense of new role

**Bedside Activities**
- Identifying needs
- Providing information
- Support to meet their needs
- Personal care/Healing
- Bring normalcy into the room
Communication Difficulty

Lack of research

- Negative feelings
- Inability to communicate
- New role as communication partner

Adverse psychological outcomes
Application of the FSM

- Family Disruption due to critical illness (communication difficulties)
- Facilitated Sensemaking Intervention
- Family Psychological Outcomes

Make sense of what has happened
Make sense of caregiver’s role

Communication intervention (VidaTalk™)

Family’s perceived communication difficulty

Anxiety
Depression
PTSD
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

<table>
<thead>
<tr>
<th>Concepts</th>
<th>Variables</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disruption</td>
<td>Communication Difficulty</td>
<td>• Family Communication Survey (FCS)</td>
</tr>
</tbody>
</table>
| Compensation (Facilitated Sensemaking) | Communication Intervention (VidaTalk™ tablet communication application) | • Family Visitation Log  
• Qual. Interview         |
| Adaptation                | Adverse psychological outcomes                | • Hospital Anxiety and Depression Scale (HADS)  
: Baseline - extubation - 1 mo. - 3 mo. - 6 mo.  
• Impact of Event Scale – revised (IES-R)  
: 1 mo. – 3 mo. – 6 mo. |
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

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>beneficial in their recovery</td>
</tr>
<tr>
<td>78%</td>
<td>normalised the critical care unit</td>
</tr>
<tr>
<td>89%</td>
<td>re-orientation with the world</td>
</tr>
<tr>
<td>100%</td>
<td>wanted regular visits</td>
</tr>
</tbody>
</table>
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’

‘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’

‘Took the emphasis of my illness for a short time’

‘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
THANK YOU 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 2nd, 2018

Ruchit V. Patel; Archana Nelliot, 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.

<table>
<thead>
<tr>
<th>LEVEL 1: Parameters for Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intubated with FiO2 &gt; 60% or</td>
</tr>
<tr>
<td>• Intubated with PEEP &gt; 8 or</td>
</tr>
<tr>
<td>• Intubated difficult airway or</td>
</tr>
<tr>
<td>• New tracheostomy or</td>
</tr>
<tr>
<td>• Acute neurological event or</td>
</tr>
<tr>
<td>• Sedated and SBS -3 to -2 or</td>
</tr>
<tr>
<td>• Vasopressor other than Milrinone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LEVEL 2: Parameters for Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intubated or tracheostomy with FiO2 ≤ 60% +/or PEEP ≤ 8 and SBS -1 to +3 or</td>
</tr>
<tr>
<td>• Noninvasive respiratory support with FiO2 &gt; 60% or</td>
</tr>
<tr>
<td>• Dialysis/Renal Replacement Therapy or</td>
</tr>
<tr>
<td>• Femoral access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LEVEL 3: Parameters for Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Non-invasive respiratory support with FiO2 ≤ 60% or</td>
</tr>
<tr>
<td>• Baseline pulmonary support or</td>
</tr>
<tr>
<td>• EVD cleared by NUS and SBS -1 to +3</td>
</tr>
</tbody>
</table>
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 ≥ 30°
- Turn q2h daytime and q4h at night
- Positioned in developmentally supportive position or as recommended by OT/PT

**Activity Progression: Level 2**
- Level 1 activities plus
- Positive touch for infants/toddlers
- Sitting up in bed TID
- Team to consider OOB to chair +/or 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

**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

Wieczorek et al. PCCM 2016
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)

- Outer Environment
  (e.g. Hospital Administration)
- Inner Environment
  (e.g. Unit Culture and Structure)
- Intervention Characteristics
  (e.g. Resources, Goals)
- Individual Characteristics
  (e.g. Education, Beliefs)
- Process
  (e.g. Implementation Strategies)

Damschroder et al. Implement Sci 2009
Demographics

Staff Participant Breakdown by Discipline

- Registered Nurse: 19
- Nurse Practitioner: 7
- Respiratory Therapist: 6
- Physical Therapist: 6
- Occupational Therapist: 3
- Speech Language Pathologist: 1
- Child Life: 1
- Social Work: 1
- MD: Fellow: 4
- MD: Attending: 4

Number of Participants

Staff Participant Experience in the JHH PICU

- < 1: 3
- 1 to 4: 22
- 5 to 8: 11
- 9 to 12: 9
- > 12: 7

Years of Experience in the Johns Hopkins PICU
RESULTS
Facilitators

- Clearly Defined Protocol
- Staff Buy-In
- Family Engagement
- Unit Morale
- Evidence of Benefits
- Champions

“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
“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

Multidisciplinary Leadership

Sharing Successes

Simulations

Environmental Modifications

Start Small

“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
References

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

Clinical Outcome Group 2012
- Safe & feasible ¹, ², ⁷, ⁹

Therapy Early Mobilization tool in progress: WeeMove

High need in CTICU 2015
- Limited research ¹, ⁵, ⁶, ⁹
- Poor outcomes

CTICU specific Early Mobility Tool

Implemented WeeMove in CTICU January 2017
- QI initiative

Purpose
- Prevent complications of immobility ⁴, ⁷, ⁸
- Increase caregiver involvement
- Enhance functional and developmental activities in critically-ill population ³, ⁸
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
**Level 1**
- Not Alert

**What can I do with my infant/Toddler**
- Sing & talk to me
- Hold & touch my hands & feet
- Capture my growth with pictures
- Comfort me with scented blanket or animal
- Clothe me as able: hats, socks, and mittens
- Lights on during the day
- Lights off for nighttime & naps

**Level 2**
- Alert
- Activities in Bed

**What can I do with my Child/Adult**
- Play my favorite music
- Talk to me about home
- Share notes and pictures from friends/family
- Perform gentle stretches to my arms and legs
- Clothe me as able
- Lights on during the day
- Lights off for nighttime and naps

**Level 3**
- Alert
- Can get out of bed
- Kangaroo Care

**What can I do with my Child/Adult**
- Activities in Level 1-2
- Encourage me to get to the chair 3x/day with meals as able
- Assist me to the urinal or bedside commode for toileting as appropriate
- Encourage me to help dress myself

**Level 4**
- Alert
- Can get out of bed/room

**What can I do with my Child/Adult**
- Activities in Level 1-3
- Take me on a walk with therapies or nursing
- Encourage me to get in to the bathroom for toileting and grooming
- Try to be in bed only for sleeping
- Continue to bring favorite toys, books and games from home

---

**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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay</td>
<td>Average 6.1 days</td>
<td>Average 6.4 days</td>
<td>Average 5.4 days</td>
<td>Average 5.61 days</td>
</tr>
<tr>
<td>Time Intubated</td>
<td></td>
<td></td>
<td><strong>Only one adverse event has occurred:</strong> NJ removal</td>
<td>Average 30.65 hours</td>
</tr>
<tr>
<td>New DVTs</td>
<td>5*</td>
<td>16</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>New Infections</td>
<td>56</td>
<td>64</td>
<td>51</td>
<td>10</td>
</tr>
<tr>
<td># of Encounters</td>
<td>702</td>
<td>660</td>
<td>701</td>
<td>327</td>
</tr>
</tbody>
</table>
Current QI Results

Barriers to PT Wee Move Therapy

NOTE: Adjacent bars of the same pattern are statistically equal (α = 0.01). Any differences in height should be considered random.
Is holding a barrier?

The 'Other' Column

- RN hold: 2%
- Provider at bedside: 8%
- Other: 4%
- Sleeping: 28%
- Holding/Bonding: 10%
- Extubation or CPAP trial: 8%

Nationwide Children's
When your child needs a hospital, everything matters.
Subjective Results

Greater caregiver engagement

Playing a more active role in cares and developmental activities

Better knowledge of developmental expectations

Reducing stress and fears associated with admission

Subjective results from caregivers and staff
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
References


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
Additional Contributors

Susan Bernot RN, MS, AGACNP-BC
Amanda Haney RN, MS, AGACNP-BC
Ashley Hennen PT, DPT
Courtney Miles BS, RCP, RRT
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\textsuperscript{st}, 2015 – March 31\textsuperscript{st}, 2016
- Post-MTTR data obtained from February 1\textsuperscript{st}, 2018 – July 31\textsuperscript{st}, 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
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.
References


Thank You

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.
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

Initiation of Early Mobility
November 2016

# of Falls

Months 2016 - 2017
# of MICU Patients with HAPU
Pre and Post Initiation of Early Mobility

Initiation of early mobility (Nov 16th) occurred after Survey
# of MICU HAPU FY 15 - FY 17

<table>
<thead>
<tr>
<th>Month</th>
<th>FY 15</th>
<th>FY 16</th>
<th>FY 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>8</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>December</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>January</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
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.
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

Kristen.Clifford@vumc.org
Regan.e.Gollehur@vumc.org
ICUdelirium.org
Remaining limitations of everyday activities in patients who were treated in the intensive care unit

Therese Lindberg¹, ², Sofia Vikström², Malin Regardt¹, ³
¹Function Area Occupational Therapy and Physical Therapy, Karolinska University Hospital,
²Department of Neurobiology, Care Sciences and Society, Karolinska Institutet,
³Department of Learning, Informatics, Management and Ethics, Karolinska Institutet
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

<table>
<thead>
<tr>
<th>Patients characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year) Medina (min-max)</td>
<td>67 (26-77)</td>
</tr>
<tr>
<td>Gender female/male</td>
<td>10/14</td>
</tr>
<tr>
<td>Surgery/medical/trauma*</td>
<td>12/6/5</td>
</tr>
<tr>
<td>Acute/elective*</td>
<td>17/6</td>
</tr>
<tr>
<td>Ventilator yes/no*</td>
<td>14/9</td>
</tr>
<tr>
<td>Sepsis yes/no*</td>
<td>5/18</td>
</tr>
<tr>
<td>APACHE II (score) Median (Q₁-Q₃)</td>
<td>17 (11-21)</td>
</tr>
</tbody>
</table>
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

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

<table>
<thead>
<tr>
<th>Categories of COPM</th>
<th>Performance (1-10)</th>
<th>Satisfaction (1-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leisure</td>
<td>3.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Self-care</td>
<td>3.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Productivity</td>
<td>3.8</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Tabel 2, Median experienced occupational performance/satisfaction per category
Results II

Moderate to high correlations was found between occupational performance/satisfaction and high score on APACHE-II (-0.51>rs<-0.50; p<0.016) and quality of life (-0.54>rs<-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
Contact information
Email: Therese.e.lindberg@sll.se
Phone: +46851772815
PROLONGED MECHANICAL VENTILATION WEANING AT LTACH’S:

DOES MOBILIZATION INFLUENCE OUTCOMES?

Heather Dunn, PhD, ACNP-BC, ARNP
Postdoctoral Fellow – College of Nursing
T32 NRO11147-06A1
Pain and Associated Symptoms
The University of Iowa

Franco Laghi, MD – Loyola University
Laurie Quinn, PhD, RN - UIC
Susan Corbridge, PhD, RN - UIC
Kamal Eldeirawi, PhD, RN - UIC
Mary Kapella, PhD, RN - UIC
Alana Steffen, PhD - UIC
Eileen Collins, PhD, RN - UIC
Conflict of Interest

Funding Sources

- Select Medical Corporation – Research Grant
- University of Iowa College of Nursing - T32 NRO11147
- University of Illinois at Chicago College of Nursing – Internal Research Grant
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 ≥ 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/LTACH length of stay} \times 7
Measures: Outcome

Ventilator Liberation

- Liberated
- Yes
- No
- # of Ventilator Days

Discharge Disposition

- Alive vs deceased
- LTACH LOS
## Overall Sample Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>68.6(±14.0)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>94.1(±36.6)</td>
</tr>
<tr>
<td>Charlson Score</td>
<td>5.9(±2.8)</td>
</tr>
<tr>
<td>STACH LOS (days)</td>
<td>26.4(±17.0)</td>
</tr>
<tr>
<td>Gender</td>
<td>n(%)</td>
</tr>
<tr>
<td>Male</td>
<td>122 (49%)</td>
</tr>
<tr>
<td>Female</td>
<td>127(51%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Underlying Etiology of PMV</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiac</td>
<td>27(10.8)</td>
</tr>
<tr>
<td>CV Surgery</td>
<td>52(20.9)</td>
</tr>
<tr>
<td>Respiratory</td>
<td>64(25.7)</td>
</tr>
<tr>
<td>Neurologic</td>
<td>30(12.0)</td>
</tr>
<tr>
<td>Trauma</td>
<td>21(8.4%)</td>
</tr>
<tr>
<td>Oncology</td>
<td>14(5.6%)</td>
</tr>
<tr>
<td>GI</td>
<td>20(8.0%)</td>
</tr>
<tr>
<td>Infection/Sepsis</td>
<td>16(7.6%)</td>
</tr>
<tr>
<td>Renal/Endocrine</td>
<td>2(&lt;1%)</td>
</tr>
</tbody>
</table>
# Outcomes

<table>
<thead>
<tr>
<th>LTACH Outcomes</th>
<th>Mean(±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTACH LOS (days)</td>
<td>35.9(±16.2)</td>
</tr>
<tr>
<td># Ventilator Days</td>
<td>20.5(±15.8)</td>
</tr>
<tr>
<td>Liberated</td>
<td>n(%)</td>
</tr>
<tr>
<td>Yes</td>
<td>172 (69.1%)</td>
</tr>
<tr>
<td>No</td>
<td>77 (30.1%)</td>
</tr>
<tr>
<td>Deceased</td>
<td>n(%)</td>
</tr>
<tr>
<td>Yes</td>
<td>62 (24.9%)</td>
</tr>
<tr>
<td>No</td>
<td>187 (75.1%)</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Frequency</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dangle/wk</td>
<td>206</td>
<td>1.58</td>
<td>1.02</td>
<td>0</td>
<td>4.15</td>
</tr>
<tr>
<td>Chair/wk</td>
<td>141</td>
<td>0.98</td>
<td>1.13</td>
<td>0</td>
<td>4.28</td>
</tr>
<tr>
<td>Ambulate/wk</td>
<td>112</td>
<td>0.77</td>
<td>1.09</td>
<td>0</td>
<td>4.2</td>
</tr>
</tbody>
</table>
Logistic Regression: Association of Frequency of Mobility to LTACH Outcomes

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>SE</th>
<th>z</th>
<th>p-value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ventilator Liberation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dangle</td>
<td>2.485</td>
<td>0.447</td>
<td>5.06</td>
<td>&lt;0.001</td>
<td>1.747,3.535</td>
</tr>
<tr>
<td>Chair</td>
<td>3.711</td>
<td>0.904</td>
<td>5.38</td>
<td>&lt;0.001</td>
<td>2.30,5.983</td>
</tr>
<tr>
<td>Ambulation</td>
<td>3.766</td>
<td>1.090</td>
<td>4.58</td>
<td>&lt;0.001</td>
<td>2.135,6.642</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dangle</td>
<td>0.745</td>
<td>0.123</td>
<td>-1.78</td>
<td>0.076</td>
<td>0.538,1.031</td>
</tr>
<tr>
<td>Chair</td>
<td>0.557</td>
<td>0.106</td>
<td>-3.09</td>
<td>0.002</td>
<td>0.384,0.807</td>
</tr>
<tr>
<td>Ambulation</td>
<td>0.506</td>
<td>0.111</td>
<td>-3.11</td>
<td>0.002</td>
<td>0.329,0.777</td>
</tr>
</tbody>
</table>
Predicted Probabilities
Frequency and Ventilator Liberation

Predicted Probabilities
Frequency and Mortality

Mobility and Ventilator Liberation

Mobility and Mortality
There is a relationship between the frequency of PT assisted mobility interventions and 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.

Conclusion
Thank You

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
Measures of PCIS clinic success

- 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:

- 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)
GEISINGER GMC PICUC

- 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
Exclusion Criteria:

- 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:

• 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
Reasons for declining:

• 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:

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
First visit – 3 HOURS LONG

- 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
- 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
• 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
Follow Up Visits – 1 hour long
MD, RN CM, Patient and Patient’s Primary Caregiver Together

- 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:

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**

- **Approached**: 231 Patients
  - **Excluded**: 58 Died during admission, 10 Suicidal, 14 Hospice
- **Final Cohort**: 149 Patients
  - **Seen in PICUC**: 45 Patients
  - **Declined**: 104 Patients
DEMOGRAPHICS

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

<table>
<thead>
<tr>
<th>ICU SURVIVOR CLINIC COHORT</th>
<th>USUAL CARE COHORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (8.9%)</td>
<td>32 (30.8%)</td>
</tr>
</tbody>
</table>

**HR = 0.268**  
95% CI = 0.093, 0.774  
**p = 0.0149**
### Stabilized Inverse Probability of Treatment Weight – Mortality Risk Adjusted Data

<table>
<thead>
<tr>
<th>ICU SURVIVOR CLINIC COHORT</th>
<th>USUAL CARE COHORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (7.8%)</td>
<td>32 (38.2%)</td>
</tr>
</tbody>
</table>

HR = 0.181  
95% CI = 0.058, 0.562  
P = 0.0031
### 30 & 60 day readmission risk unadjusted data

<table>
<thead>
<tr>
<th>Readmissions</th>
<th>PICU Clinic Cohort</th>
<th>Usual Care Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 day</td>
<td>4 (8.9%)</td>
<td>24 (23.1%)</td>
</tr>
<tr>
<td>60 day</td>
<td>4 + 3 = 7 (15.6%)</td>
<td>24 + 7 = 31 (29.8%)</td>
</tr>
<tr>
<td>Statistics</td>
<td>HR = 0.353</td>
<td>HR = 0.471</td>
</tr>
<tr>
<td></td>
<td>95% CI = 0.123, 1.009</td>
<td>95% CI = 0.210, 1.054</td>
</tr>
<tr>
<td></td>
<td>p = 0.0521</td>
<td>p = 0.0668</td>
</tr>
</tbody>
</table>
Health Economics Analysis

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

### 30 day ICU SURVIVOR CLINIC N= 28

<table>
<thead>
<tr>
<th></th>
<th>Total Cost</th>
<th># member with utilization</th>
<th>Average cost per member</th>
<th># of visits</th>
<th>Average cost per visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED + Obs cost</td>
<td>$5,654</td>
<td>6</td>
<td>$942</td>
<td>9</td>
<td>$628</td>
</tr>
<tr>
<td>Readmit cost</td>
<td>$10,196</td>
<td>2</td>
<td>$5,098</td>
<td>2</td>
<td>$5,098</td>
</tr>
<tr>
<td>Total post acute care/rehab cost</td>
<td>$145,161</td>
<td>7</td>
<td>$20,737</td>
<td>7</td>
<td>$20,737</td>
</tr>
</tbody>
</table>

### USUAL CARE N= 79

<table>
<thead>
<tr>
<th></th>
<th>Total Cost</th>
<th># member with utilization</th>
<th>Average cost per member</th>
<th># of visits</th>
<th>Average cost per visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED + Obs cost</td>
<td>$3,887</td>
<td>5</td>
<td>$777</td>
<td>10</td>
<td>$389</td>
</tr>
<tr>
<td>Readmit cost</td>
<td>$166,678</td>
<td>14</td>
<td>$11,906</td>
<td>16</td>
<td>$10,417</td>
</tr>
<tr>
<td>Total post acute care/rehab cost</td>
<td>$446,011</td>
<td>30</td>
<td>$14,867</td>
<td>32</td>
<td>$13,937</td>
</tr>
</tbody>
</table>

### Total Cost Average per clinic member

- **Total Cost:** $320,899
- **Average per clinic member:** $11,461

### Patient Cost Share

- **Total Cost:** $9,932
- **Average per clinic member:** $355

### Total Cost Average per usual care member

- **Total Cost:** $922,863
- **Average per usual care member:** $11,682

### Patient Cost Share

- **Total Cost:** $36,684
- **Average per usual care member:** $464
# Health Economics Analysis

## 60 day ICU SURVIVOR CLINIC N=28 vs USUAL CARE N=79

<table>
<thead>
<tr>
<th></th>
<th>ICU SURVIVOR CLINIC N=28</th>
<th>USUAL CARE N=79</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Cost</td>
<td>Total Cost</td>
</tr>
<tr>
<td>ED + Obs cost</td>
<td>$10,266</td>
<td>$4,417</td>
</tr>
<tr>
<td># member with utilization</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Average cost per member</td>
<td>$933</td>
<td>$736</td>
</tr>
<tr>
<td># of visits</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>Average cost per visit</td>
<td>$540</td>
<td>$294</td>
</tr>
<tr>
<td>Readmit cost</td>
<td>$23,729</td>
<td>$231,695</td>
</tr>
<tr>
<td># member with utilization</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Average cost per member</td>
<td>$7,910</td>
<td>$13,629</td>
</tr>
<tr>
<td># of visits</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Average cost per visit</td>
<td>$5,932</td>
<td>$11,585</td>
</tr>
<tr>
<td>Total post acute care/rehab cost</td>
<td>$162,836</td>
<td>$456,911</td>
</tr>
<tr>
<td># member with utilization</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>Average cost per member</td>
<td>$23,262</td>
<td>$15,230</td>
</tr>
<tr>
<td># of visits</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Average cost per visit</td>
<td>$20,355</td>
<td>$14,278</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Cost Average per clinic member</th>
<th>Total Cost Average per usual care member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost</td>
<td>$ 432,554 $15,448</td>
</tr>
<tr>
<td>Patient Cost Share</td>
<td>$ 17,062 $609</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$1,483,455 $18,778</td>
</tr>
<tr>
<td>Patient Cost Share</td>
<td>$ 44,001 $557</td>
</tr>
</tbody>
</table>
SAVINGS:
4 avoided readmissions every 30 day epoch $12,000 x 4 = $48,000
Costs saved per member for the Plan $ 8,182
Costs saved per member for the member $ 4,057

COSTS:
RN CM $ 8,417
(Missing costs: MD, Psy D, PhD, clinic space) ___________

NET Savings for Plan/Patient for a 30 day epoch $ 44,817
## Why Hospital Administration Should Support the ICU Survivor Clinic

### ICU Clinic Cohort N = 28

<table>
<thead>
<tr>
<th></th>
<th>30 DAY</th>
<th>60 DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Readmission Rate</strong></td>
<td>6.7%</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>Average LOS</strong></td>
<td>1.5 DAYS</td>
<td>2.7 DAYS</td>
</tr>
</tbody>
</table>

### Usual Care Cohort N = 79

<table>
<thead>
<tr>
<th></th>
<th>30 DAY</th>
<th>60 DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Readmission Rate</strong></td>
<td>16.8%</td>
<td>20.2%</td>
</tr>
<tr>
<td><strong>Average LOS</strong></td>
<td>6.1 DAYS</td>
<td>5.4 DAYS</td>
</tr>
</tbody>
</table>
# Why Hospital Administration Should Support the ICU Survivor Clinic

<table>
<thead>
<tr>
<th>30 DAY READMISSIONS</th>
<th>Patient Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient days consumed for ICU Clinic Cohort Readmits</td>
<td>2.81</td>
</tr>
<tr>
<td>Patient days consumed for Usual Care Cohort Readmits</td>
<td>80.96</td>
</tr>
<tr>
<td>Patient days consumed if UC enrolled in ICU Survivor Clinic</td>
<td>7.93</td>
</tr>
<tr>
<td>Patient days potentially saved for other admissions</td>
<td>73.03</td>
</tr>
<tr>
<td>3 day LOS – 24.3 patients/30 days</td>
<td>288/annually</td>
</tr>
<tr>
<td>4 day LOS -  18.25 patients/30 days</td>
<td>216/annually</td>
</tr>
<tr>
<td>5 day LOS – 14.6 patients/30 days</td>
<td>175/annually</td>
</tr>
</tbody>
</table>
Thank you to:

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:
- Marekay Wray
Questions?

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clbeiter1@thehealthplan.com
ehall1@geisinger.edu
kpsnell@geisinger.edu
FIRST AID KIT FOR PICS
POST INTENSIVE CARE SYNDROME

Bo Van den Bulcke
Intensive Care Department
Ghent University Hospital
01. Introduction

› More focus on PICS syndrome last decade
› Prevention techniques
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

Post Intensive Care

- Family
  - Psychological
    - Anxiety
    - Depression
    - Sleep disorders
    - PTSD
  - Psychological
    - Anxiety
    - Depression
    - Sleep disorders
- Patient
  - Cognitive
    - Memory
    - Attention
    - Mental processing
- Physical
  - Weakness
  - Fatigue
  - Mobility
  - Limitations

Adapted from Davidson JE, et al.
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

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

<table>
<thead>
<tr>
<th>Feature</th>
<th>3mo Post-ICU</th>
<th>12mo Post-ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>• 30% (no depression history)</td>
<td>• 29% (no depression history)</td>
</tr>
<tr>
<td></td>
<td>• 52% (history of depression)</td>
<td>• 43% (history of depression)</td>
</tr>
<tr>
<td>Post-traumatic stress disorder (PTSD)</td>
<td>• 7% related to critical illness</td>
<td>• 7% related to critical illness</td>
</tr>
<tr>
<td></td>
<td>• 19-29% (symptoms of PTSD)</td>
<td>• 19-28% (symptoms of PTSD)</td>
</tr>
</tbody>
</table>

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.

Depression, PTSS and functional disability The BRAIN-STUDY, Jackson et al., 2014
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

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

[Handwritten text in Dutch]

Maandag 5 december 2011

Anna met een zuchten. Ze heeft de radio laten aan en is naar de keuken gegaan om een koffie te maken.
Results MUSIC (2014-2016)

Three main themes total of 271 comments

'Emotional and physical wellbeing' (60,2%)
- Emotional wellbeing
- Pain and discomfort
- Sleep
- ICU environment
- Physical disabilities
- Cognitive functioning

'Experiences with health care providers' attitude (11,8%)
- Experiences of care
- Attitude of hcp

'Factors strongly affecting the ICU hospitalization’ (28,0%)
- Music
- Visitors, family support
- Trust in healthcare
- Communication

Emotional wellbeing
- Anxiety
- Dependency
- Frustration
- Rumination
- General coping

Anxiety
- Depression
- Sleep
- ICU environment
- Physical disabilities
- Cognitive functioning

Experiences of care
- Trust in healthcare
- Communication

Attitude of hcp
- Music
- Visitors, family support
- Trust in healthcare
- Communication
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
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!
BO VAN DEN BULCKE
PSYCHOLOGIST INTENSIVE CARE
GHENT UNIVERSITY HOSPITAL
BO.VANDENBULCKE@UZGENT.BE

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C. Heymanslaan 10  |  B 9000 Gent
T +32 (0)9 332 21 11
E info@uzgent.be

www.uzgent.be
Volg ons op
Comparison of healthcare professionals experiences of the use of patient diaries from two intensive care units

Louise Roberts¹ and Joanne G. Outtrim²

¹Neuroscience Critical Care Unit, Cambridge University Hospitals NHS Foundation Trust and ²Division 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 units 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."

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, Caitlin 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 3-6: Utilized midazolam, fentanyl and rocuronium for sedation and neuromuscular blockade to optimize oxygenation.
- 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 74-78: Tracheostomy decannulation on day 139 from onset of critical illness.
- 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.
- HD 64: Tracheostomy for anticipated need for long term mechanical ventilation.

Rest of hospital course: See chart for details.

<table>
<thead>
<tr>
<th>Day of Cannulation</th>
<th>Patient Total Dose (Dosing wt 65 kg)</th>
<th>RESTORE Secondary Analysis (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioid</td>
<td>Fentanyl 31.5 mcg/kg (Infusion+bolus)</td>
<td>Morphine 3.7 mg/kg (Infusion)</td>
</tr>
<tr>
<td>Benzodiazepine</td>
<td>Midazolam 1.14 mg/kg (Infusion+bolus)</td>
<td>Midazolam 2.8 mg/kg (Infusion)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cumulative Dose While on ECMO</th>
<th>Patient Mean Cumulative Dose (Dosing wt 65 kg)</th>
<th>RESTORE Secondary Analysis (3) Mean Cumulative Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioid</td>
<td>0.56 mg/kg/day (Infusion+bolus)</td>
<td>9.7 mg/kg/day</td>
</tr>
<tr>
<td>Benzodiazepine</td>
<td>0.43 mg/kg/day (Infusion+bolus)</td>
<td>9.4 mg/kg/day</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significant Characteristics</th>
<th>Case Study</th>
<th>RESTORE Secondary Analysis Patient Characteristics of ECMO Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>11 years old</td>
<td>Median age at admission to PICU 4.2 (0.8-12)</td>
</tr>
<tr>
<td>Therapies/ABCDEIF ICU Bundle Similarities</td>
<td>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.</td>
<td>Sedation algorithm for 29 of the 61 pt’s enrolled in study. OT/PT not described.</td>
</tr>
</tbody>
</table>

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.

References

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 outcomes1. 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.

Objectives
To demonstrate progress of patient outcomes in oncology 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 outcomes1. 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.

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

Conclusions
There is currently limited evidence on implementing and the efficacy of an early mobilization program in an oncology ICU.1 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.

References
1. Pun, et al., Caring for Critically Ill Patients with the ABCDEF Bundle: Results of the ICU Liberation Collaborative in Over 15,000 Adults. Critical Care Medicine, 2018; epublished ahead of print.
INFINITY ∞ BREATHELESS: 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 each others’ 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.

Case Description

PMH:
- 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
- 8/22/16: Bed mobility performed with max assist x 2.
- 8/25/16: Hypoxic arrest due to mucous plugging while on tracheostomy.
- 9/29/16:
- 10/19/16:
- 12/21/16: Transferred to acute rehab.

Treatment Challenges

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

Medical Issues:
1. Marfan’s Syndrome
2. Pectus excavatum with restrictive lung disease.
3. DCM with EF 12%.
5. Pneumonia with copious secretions.
6. Trach to vent.
7. Bilateral foot drop.
8. Prior cardiothoracic surgeries (Type B aortic dissection and AAA repairs).
9. Chronic coughing with sternal pain and overall fatigue limiting participation in PT sessions.

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.

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

Elizabeth Zook BA, BSN, RN, CCRN
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.

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 in 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.

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.

<table>
<thead>
<tr>
<th>Month</th>
<th>Total # patients</th>
<th>Total # vent patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>October</td>
<td>52</td>
<td>8</td>
</tr>
<tr>
<td>November</td>
<td>65</td>
<td>6</td>
</tr>
<tr>
<td>December</td>
<td>48</td>
<td>9</td>
</tr>
<tr>
<td>January</td>
<td>54</td>
<td>9</td>
</tr>
<tr>
<td>February</td>
<td>42</td>
<td>12</td>
</tr>
<tr>
<td>March</td>
<td>36</td>
<td>7</td>
</tr>
</tbody>
</table>
An approach to the safe mobilization and early rehabilitation of patients on ECLS with mediastinal cannulation using TIME-OUT

Jamil Latif, Kaitlin Armes, Rebecca West, Paul Kratz, Mark Todd, Anne-Marie Guerguerian.

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.

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>
<thead>
<tr>
<th>Action Item</th>
<th>Process</th>
<th>Team Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobilization Cart Set-up</td>
<td>IV pumps, blood flow monitor with backup battery, &amp; power bar</td>
<td>Physiotherapist &amp; ECLS Specialist</td>
</tr>
<tr>
<td>2. Oxygen tanks: one for patient and a second for iLA O2</td>
<td>Portable suction with catheters</td>
<td></td>
</tr>
<tr>
<td>3. Cannula clamps</td>
<td>ECG and SpO2 monitor clamped to cart</td>
<td></td>
</tr>
<tr>
<td>2. Wheelchair Set-up</td>
<td>Clamps at the base to attach cart to the wheelchair</td>
<td>Physiotherapist &amp; ECLS Specialist</td>
</tr>
<tr>
<td>Membrane leveler on articulating arm</td>
<td>Pressure relieving cushion</td>
<td></td>
</tr>
</tbody>
</table>

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

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 a 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.

Affiliations

Hospital for Sick Children, Department of Critical Care Medicine, University of Toronto.
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Exploration of healthcare professionals experiences following the implementation of electronic patient diaries into ICU

Joanne G. Outtrim¹ and Louise Roberts²

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

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

Joanne Outtrim jgo22@cam.ac.uk Louise Roberts louise.roberts@addenbrookes.nhs.uk
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 for pediatric patients supported by 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 rest 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.

The patient was admitted on February 23, 2017 with acute respiratory failure due to influenza A/H1N1.

The patient was a 13 yo 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 40 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-fermal cannula, transitioned to veno-venous venous (VV ECMO) on February 26, 2017 , she was later emergently transitioned to veno-venous (VV ECMO) with femoral and internal (jugal) 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 (BDCVL) 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 ICI mobility scale (IMS) [4]. While on ECMO 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.

<table>
<thead>
<tr>
<th>Date</th>
<th>Mobility Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/7/2018</td>
<td>Bed level PT and OT initiated</td>
</tr>
<tr>
<td>4/6/2017</td>
<td>Sitting edge of bed (EOB) with moderate assist</td>
</tr>
<tr>
<td>4/11/2017</td>
<td>Sit to stand with max assist of 4 persons</td>
</tr>
<tr>
<td>4/15/2017</td>
<td>Sit to stand with mod assist of 2 persons</td>
</tr>
<tr>
<td></td>
<td>Gait training initiated with gloom body weight</td>
</tr>
<tr>
<td>4/19/2017</td>
<td>Support system</td>
</tr>
<tr>
<td></td>
<td>Treadmill training initiated with LiteGait</td>
</tr>
<tr>
<td>4/27/2017</td>
<td>Heart weight support system</td>
</tr>
<tr>
<td>5/21/2017</td>
<td>System with moderate assist</td>
</tr>
<tr>
<td>6/13/2018</td>
<td>Independently ambulating with rolling walker</td>
</tr>
<tr>
<td>7/20/2018</td>
<td>Independent ambulatory without assist</td>
</tr>
<tr>
<td>8/30/2017</td>
<td>Daily pulmonary gym program initiated</td>
</tr>
</tbody>
</table>

Table 1. Patient’s mobility progression by day. Progression noting assistive and supportive devices utilized.

Active PT and OT was initiated on ECMO day 10. This therapy program included bed level therapy and co-assistant ROM. The patient’s initial MMT strength was 1/5 globally.

Patient was placed on hold on ECMO day 12 due to hemotorses 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 1/5.

On ECMO day 38 (April 3, 2017) 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 3/10. 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 volume on the ventilator. At that time she was noted to have several bronchofibrolateral fistulas for which 3 endobronchial valves were placed. At this time the patient was again placed on hold for therapy intervention.

Therapy was reintiated 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 38%. 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.

**REFERENCES**

- 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 subtle 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 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.
ICU Delirium Documentation in the EHR- A Medical Student QI Project
Michael Desciak BS, Shaun Pienkos BS, Lucie Henry BS, Philip Krupka BS, Karen Korzick MD MA. Geisinger Medical Center, Danville, PA

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 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.

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. 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.

Results

<table>
<thead>
<tr>
<th></th>
<th>PRE-INTERVENTION</th>
<th>INTERVENTION</th>
<th>POST-INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.2%</td>
<td>45.9%</td>
<td>51.9%</td>
</tr>
</tbody>
</table>

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.

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

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 Williams Silva Giacomassi1; Nayara Alexia Moreno2; Bruno Garcia de Aquino1; Isabel Fialho Fontenele Garcia3; Lucas Spadoni Tavares4; Adriana Claudia Lunardi5.6
1 Institute of Medical Assistance to the State Public Servant, Physical Therapy Service, 2 University City of São Paulo, São Paulo, Brazil, 3 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 functionality1. Therefore, preventing inactivity during hospitalization can be a way to prevent loss of older patients’ independence2. 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 bed2. Aim: To assess the effect of advice about the importance to keep active 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)1 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) 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.

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.

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

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

Contact Information: Ivens Williams Silva Giacomassi/ ivensws@hotmail.com
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, MScN\textsuperscript{1,2}, Magdalena Fischill, MScN\textsuperscript{2}, Drrer.nat. Teresa Deffner\textsuperscript{3}, Valentin Neudeck, MScN\textsuperscript{3}, Dr.phil. Patrik Heindl\textsuperscript{3}

1 Nursing Research, University Hospital Schleswig-Holstein, 2 Department of Anaesthesiology and Intensive Care Medicine, University Hospital Schleswig-Holstein, Germany; 3 Salzburg, Austria; 4 Department of Anaesthesiology and Intensive Care Medicine, University Hospital Jena, Germany; 5 Advanced Nursing Practitioner, Vienna General Hospital – Medical University Campus, Austria

**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 searched using systematic search strategies. Studies were included if diagnostic interviews or validated questionnaires were used to proof diagnosis of PTSD, anxiety and depression in randomized, controlled trials or 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).

**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\textsuperscript{2-7}. Studies ratings ranged from low to good. We found protocols of another 6 ongoing studies with PTSD in patients as primary outcome.

**Conclusions:** ICU diaries may reduce the risk of psychological complications in patients and relatives after ICU stay\textsuperscript{8}.

---

For fast readers: Diaries reduce the risk for PTSD, anxiety or depression in ICU patients and their families.

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

For fast readers: We replicated a recent Cochrane Review, but included additional outcomes data from validated methods of diagnosing psychological complications that were not considered in the original Cochrane Review.

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

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

---

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

<table>
<thead>
<tr>
<th>Study in Language</th>
<th>Diaries</th>
<th>No Diaries</th>
<th>Total</th>
<th>Weight</th>
<th>Hw Rando, 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>German 2012, 12 M</td>
<td>15</td>
<td>15</td>
<td>30</td>
<td>0.28-0.83 (0.51)</td>
<td></td>
</tr>
<tr>
<td>German 2012, 12 M</td>
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<td>15</td>
<td>30</td>
<td>0.28-0.83 (0.51)</td>
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<td>15</td>
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<td>15</td>
<td>30</td>
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</tr>
<tr>
<td>Total 50% CD</td>
<td>206</td>
<td>206</td>
<td>412</td>
<td>0.85 (0.24, 1.42)</td>
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<tr>
<td>Total analyses</td>
<td>16</td>
<td>16</td>
<td>32</td>
<td>0.01</td>
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</tbody>
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**Fig. 2 Diaries vs. no diaries and PTSD in relatives**

<table>
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<th>Study in Language</th>
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<th>Total</th>
<th>Weight</th>
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<tr>
<td>Total 50% CD</td>
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<tr>
<td>Total analyses</td>
<td>16</td>
<td>16</td>
<td>32</td>
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**Fig. 3 Diaries vs. no diaries and Anxiety in patients**

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

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<td>0.28-0.83 (0.51)</td>
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<tr>
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<tr>
<td>Total analyses</td>
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<td>32</td>
<td>0.01</td>
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Development of a Femoral ECMO Mobility Protocol: Do the Benefits Outweigh the Risks?

Michelle Cangialosi, PT, DPT, UF Health Rehab Center – UF Health Heart and Vascular Hospital

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.

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. 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 EOBI, 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 to transplant? Are the patients mechanically ventilated via ETT or tracheostomy?
- What are the mobility precautions post ECMO decannulation?

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 EOBI, 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?
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- 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?
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- 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 to transplant? Are the patients mechanically ventilated via ETT or tracheostomy?
- What are the mobility precautions post ECMO decannulation?

Conclusions

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.

References


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.
Intensive Care staff experience prior to introduction of patient diaries

Joanne G. Outtrim¹ and Louise Roberts²

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

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.

Joanne Outtrim jgo22@cam.ac.uk Louise Roberts louise.roberts@addenbrookes.nhs.uk
Pain relieved - but still struggling
Critically ill patients’ experiences of pain and other discomforts during analgosedation

Helene Berntzen*,** CCN, MSc, PhD-student uhebe@ous-hf.no, Hilde Wøien*,** RN, CCN, PhD, Associate professor, Ida Torunn Bjørk*** Dr.polit., Professor emerita,

*Department of Postoperative and Intensive Care, Division of Emergencies and Critical Care, Oslo University Hospital, ** Department of Nursing Sciences, Institute of Health and Society, University of Oslo, Norway

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.

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

References:
All illustrations downloaded from www.google.com
Electronic Health Record Tool to Improve Interprofessional Communication and Outcomes related to Early Mobility in the Intensive Care Unit

Robert Anderson RN, BAN1,2; Kathleen Sparbel PhD, FNP-BC1; Rhonda Barr DPT, MA, CCS2
Kevin Doerschug MD, MS2
1. University of Illinois at Chicago College of Nursing; 2. University of Iowa Hospitals and Clinics

Project Implementation

**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)*
- Length of mechanical ventilation
- Duration of Admission to ICU
- ICU Cost

**Outcomes**

**Staff Data**

**Staff Responding to Survey**

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>Attending</th>
<th>Resident</th>
<th>Fellow</th>
<th>ARNP/PA</th>
<th>Staff Nurse</th>
<th>Nurse Manager</th>
<th>Physical Therapist</th>
<th>Respiratory Therapist</th>
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<tbody>
<tr>
<td>Pre</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>38</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Post</td>
<td>79</td>
<td>67.4</td>
<td>34.9</td>
<td>0.023*</td>
<td>0.015*</td>
<td>0.469</td>
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* Statistically Significant, p<0.05

**Staff Perception of Interprofessional Communication Attributes**

<table>
<thead>
<tr>
<th>% of Staff</th>
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<th>Post</th>
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<tbody>
<tr>
<td>Moderate or Slightly</td>
<td>64.3%</td>
<td>64.3%</td>
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<tr>
<td>Satisfied</td>
<td>31%</td>
<td>31%</td>
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<tr>
<td>Frequency - Greater than 50% of the time</td>
<td>28.1%</td>
<td>28.1%</td>
</tr>
<tr>
<td>Overall Effectiveness</td>
<td>34.9%</td>
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</tbody>
</table>

**Patient Data**

**Patient Group Comparison**

<table>
<thead>
<tr>
<th>Patient Data</th>
<th>Description</th>
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<td>Charts Reviewed</td>
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<td>137</td>
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</tr>
<tr>
<td>Charts Included</td>
<td>32</td>
<td>31</td>
<td>0.93</td>
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</tr>
<tr>
<td>Age (mean)</td>
<td>51.8 yrs.</td>
<td>56.5 yrs.</td>
<td>0.24</td>
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</tr>
<tr>
<td>Gender</td>
<td>Male = 22</td>
<td>Female = 10</td>
<td>Male = 18</td>
<td>Female = 13</td>
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<tr>
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<td>Pulmonary = 10</td>
<td>Cardiovascular = 3</td>
<td>Neurologic = 8</td>
<td>Gastrointestinal = 4</td>
</tr>
</tbody>
</table>

**Patient Specific Outcomes**

| Hours from Admit to Mobility Goal (RN) | 116.323 | 86.696 | -29.63 | 0.023* |
| Hours from Admit to Mobility Goal (PT) | 122.448 | 84.329 | -38.1 | 0.015* |
| Hours on Ventilator | 95.194 | 68.232 | -26.96 | 0.129 |
| Hours in ICU | 164.747 | 108.155 | -56.59 | 0.023* |

* Statistically Significant, p<0.05

**System outcome implications**
- Reduced ICU costs benefits patient, 3rd party payer, and institution
- May allow expanding rehab or nursing staff to support early mobility practices 7-days per week

**Limitations**
- Transparency of staff
- Inability to mandate completion of eMobility module
- Non-paired survey responses

**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.

**References**


**Acknowledgements**

University of Iowa Hospitals and Clinics/College of Nursing and Patient Care Services, Interprofessional staff of the Medical Intensive Care Unit (MICU); Dr. Pamela Hill, Dr. Kirsten Hanrahan, University of Iowa Nursing Research, Evidence-Based Practice and Quality.
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.

**Treatment Barriers**
- Early mobility program initiatives
- Interpretation of regulatory agency recommendations for PPE use
- Restricted and ineffective mobility
- Patient safety concerns
- Staff dissatisfaction, confusion and frustration

**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

**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.

**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’s regional centers and the flagship medical center.

**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

**Table 1: Patient Bodily Fluid Exposure During Therapy Treatment**

<table>
<thead>
<tr>
<th>Session</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient incontinent of urine and/or stool with or without garment</td>
<td>11%</td>
</tr>
<tr>
<td>Handling rectal tube and/or foley catheter</td>
<td>4%</td>
</tr>
<tr>
<td>Patient with oral and tracheal secretions</td>
<td>11%</td>
</tr>
<tr>
<td>Malfunctioning arterial line</td>
<td>1%</td>
</tr>
<tr>
<td>Multiple wound sites draining/leaking</td>
<td>1%</td>
</tr>
<tr>
<td>Patient vomited during stair training in stairwell</td>
<td>13%</td>
</tr>
<tr>
<td>Unexpected Chemo spill while ambulating</td>
<td>2%</td>
</tr>
<tr>
<td>Leaking JP Drain – JP Drain snapped open</td>
<td>10%</td>
</tr>
<tr>
<td>Surgical/ wound dressings needed reaplication</td>
<td>33%</td>
</tr>
<tr>
<td>Leaking IV site</td>
<td>15%</td>
</tr>
<tr>
<td>Hemovac tubing disconnected during ambulation</td>
<td>8%</td>
</tr>
</tbody>
</table>

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

- Baylor Garland (130 beds)
- Baylor University Medical Center (1024 beds)

**Acknowledgments**
Courtney LaFollette, DPT; Jennifer Koch, DPT; Kimberly Newman, RN, 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 PTTS. 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

Elizabeth Appel, PT, DPT¹, Katherine Traditi, PT, DPT²
¹,² NYU Langone Health

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, graft, 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-corporal 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 ability. It was tracked daily to show the patient’s progress throughout his hospital stay.

RESULTS

This patient

PT

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 8 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.

TIMELINE & IMAGES

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

TandemHeart explanted

AIMPAC Score

<table>
<thead>
<tr>
<th>6/24</th>
<th>9/24</th>
<th>20/24</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE</td>
<td>Initial mobility</td>
<td>Discharge</td>
</tr>
</tbody>
</table>

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.

REFERENCES


Images:
https://www.semanticscholar.org/paper/Concurrent-Left-Ventricular-Assist-Device-LVAD)/to-Schmack-Weymann/805be631194595e6e60687a6e6781f245167506f2
https://www.ahajournals.org/doi/full/10.1161/CIRCINTERVENTIONS.116.004337
Physical Therapy Interventions and Early Mobility in the Neonate on ECMO

Ana M. Jara1, PT, DPT, NIDCAP
Johns Hopkins All Children’s Hospital, St. Petersburg, FL, USA;

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.
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 retractions or leg extension in 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 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

Behavior communication signal of autonomy, motor, state, and self-regulation system

- 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 infants.
- 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 these 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 activity is dependent 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, was potential for retention of the reflexes.

Objective

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.
4. To describe handling and positioning on the neonate on ECMO to decreased influence of tonic labyrinthine reflex in supine.

Behavior
- Sedated/sleeping
- Experiencing activity
- Stressed, muscle tone is increased, tremors, color changes, crying
- Sucking on ET tube

At care time

Intervention
- Discuss evaluation sedation as possible
- Extracorporeal membrane oxygenation and all catheter lines, ventilator, chest tube, incubator and medical equipment
- Give supported boundaries, firm touch, improve position to decreased TLR in extension, moderate care and give boundaries, pacifier care based on infant care, muscle elongation/stretching and soft tissue mobilization to tensed muscles modified to meet the needs of the baby.
- Clean mouth gently to promote pleasant sensations in oral area, offer pacifier to prevent pacifier to avoid stress and reaching
- Improve position and educating bedside nurse and parents

Position

- Joint at resting position
- Joint at closed pack position
- With elbow in flexion make a gentle distraction to descend the shoulders, it will improve lymphatic flow (caution on the side, avoid if change ECMO flow)
- Position evaluated, avoid excessive elbow, flexion, kneel. Gentle low range of motion
- Lymphatic drainage (towel a Oak)
- Elbow need to be loose to avoid any pressure on skin, also look at line/tubes over any part of body

Parents

- In the room, away from baby
- At the bedside
- Participating in care
- Educate importance of participation on the baby’s care, encourage them and offer support so they will become comfortable caring for their baby.
- Educate awareness of line and in the incubator and around. Educated how to read baby’s cues.
- Help them finding 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.
- Discuss sensory and how senses at the time might-be too much stimulation as a firm touch and holding give a better response.
- Education on how to help at the time of care. Promote closeness and bonding between parents and infant
- Teach how to offer pacifier, touch the face and when baby open mouth direct tip in the palate. Follow baby’s cues. Use smaller pacifier.

Handling for position change / linear change / weight bearing/mobility

- Who is handling the infant and how
- Communicate and task assignment, who is handling baby must hold pelvis in posterior tilt to avoid restriction of TLR and agitate infant. ECMO nurse help with head and tuck and but need to avoid head in extension when lifting
- Movement must be slow and modulated and not too high,
- Keep neonate in tucked position with pelvis in posterior tilt
- Maintain shoulder boundaries to keep patient in tucked position
- Think of a two-sided 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.

Bath time

- Best when minimal assessment to be done to keep it short
- With the head in extension, there is visible shoulder retraction. Early flexion results in shoulder protraction within 5 and the disapperaance of extension posture

Environment

- Sound 
- Light
- Attend to alarms promptly.
- Avoid direct light to eyes, cycle day and night appropriately but avoid too bright on day time

Table 3: Tonic Labyrinthine Reflex supine

<table>
<thead>
<tr>
<th>Degree of Tonic Labyrinthine Reflex Supine</th>
<th>Observation</th>
</tr>
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<tbody>
<tr>
<td>0 Absent (this may be seen in the floppy baby)</td>
<td></td>
</tr>
<tr>
<td>1+ Increased extensor tone is felt in the neck, shoulders, trunk, on lower extremities, but shoulder retraction and extension extensors are not observed</td>
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<tr>
<td>2+ With the head in extension, there is visible shoulder retraction. Early flexion results in shoulder protraction within 5 and the disappearance of extension posture</td>
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<tr>
<td>3+ Response is 1+ and but with head flexion, shoulder retraction or full (120°) extension of lower extremities permits (5-30)</td>
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Table 2: Joint at resting position

<table>
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<tr>
<th>Position</th>
<th>Observation</th>
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<tbody>
<tr>
<td>Shoulder</td>
<td>Upper extremities be possible</td>
</tr>
<tr>
<td>Glenohumeral</td>
<td>Flexion 30, abduction 90, internal rotation</td>
</tr>
<tr>
<td>Elbow</td>
<td>Flexion 30, supination 10 degrees</td>
</tr>
<tr>
<td>Hip</td>
<td>Flexion 30, abduction 30, small extension</td>
</tr>
<tr>
<td>Knee</td>
<td>Flexion 25 degree</td>
</tr>
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</tr>
<tr>
<td>Knee</td>
<td>Flexion 25 degree</td>
</tr>
</tbody>
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Nurses’ Perceived Barriers and Educational Needs for Early Mobilization of Critically Ill Patients in Korea
Changhwan Kim MSN, RN, Mona Choi PhD, RN, Sanghee Kim PhD, RN, Jeong Hoon Yang PhD, MD

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 nurses 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 α (.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 α (.89)
- Total 12 items

Top 3 Ranked Educational Parts of Necessity for EM
- Potential Problems and Solution when Implementing EM
- Relevant Protocol/ Guideline of EM
- EM for Patients in Special Condition (CRRT, ECMO etc)

Results
Characteristics of Participants’ Experience of Early Mobilization (EM)
- Implementation of EM
- Presence of Guideline/Protocol
- Experience EM in the past year

Education Characteristics of Early Mobilization (EM)
EM Education
- Received
- No Received

Need of EM Education
- Not Needed
- Moderate
- Needed

High Scored Perceived Barriers to Early Mobilization (EM)
- Inappropriate nurse/patient ratio
- Lack of Time
- Unclear Role
- Patients’ Inability to Exercise
- High Workload
- Absence of relevant education

Barriers to Early Mobilization
- Characteristic
- n
- Total
- Knowledge
- Attitude
- Behavior

- Presence of guideline/protocol
- Implementation of EM
- Experience with EM in the past year
- Presence of critical care nurses educators
- Presence of critical care nurses specialists

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

Andrew D. May, MA1,3; Mana K. Ali, PhD2; Megan M. Hosey, PhD1
1 Department of Physical Medicine and Rehabilitation, Johns Hopkins University School of Medicine, Baltimore, MD, USA;
2 MedStar National Rehabilitation Network, Washington, DC, USA
3 American School of Professional Psychology at Argosy University – Northern Virginia, Arlington, VA, USA

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%, χ²(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

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Psychology Consults (N=79)</th>
<th>Total MICU Admissions (N=1454)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman</td>
<td>43 (54)</td>
<td>687 (47)</td>
<td>.20</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>.06</td>
</tr>
<tr>
<td>White</td>
<td>42 (53)</td>
<td>584 (40)</td>
<td>.26</td>
</tr>
<tr>
<td>Black</td>
<td>32 (41)</td>
<td>706 (49)</td>
<td>.39</td>
</tr>
<tr>
<td>Other</td>
<td>5 (6)</td>
<td>164 (11)</td>
<td>.97</td>
</tr>
<tr>
<td>Age (years)</td>
<td>56 ± 15</td>
<td>55 ± 16</td>
<td>.97</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td>.25</td>
</tr>
<tr>
<td>Married</td>
<td>46 (59)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>26 (33)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>4 (5)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>2 (3)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Total MICU Length of Stay (days)</td>
<td>12 ± 9</td>
<td>4 ± 6</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>MICU Day at Rehabilitation Psychology Consult (days)</td>
<td>8 ± 6</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Mortality During Hospital Admission</td>
<td>19 (24)</td>
<td>247 (17)</td>
<td>.11</td>
</tr>
</tbody>
</table>

Note: p-values calculated using χ² for categorical variables and independent sample t-tests for continuous variables

Sample Characteristics of Most Common Psychology Consultations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Reason for Rehab Psychology Consult</th>
<th>Emotional Distress (N=44)</th>
<th>Rehab Engagement (N=19)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Woman</td>
<td></td>
<td>28 (64)</td>
<td>5 (26)</td>
<td>.01</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td>25 (57)</td>
<td>.25</td>
</tr>
<tr>
<td>White</td>
<td></td>
<td>26 (59)</td>
<td>9 (47)</td>
<td>.39</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td>15 (34)</td>
<td>10 (53)</td>
<td>.12</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>3 (7)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td>56 ± 12</td>
<td>57 ± 17</td>
<td>.21</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td>.29</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td>29 (67)</td>
<td>8 (42)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>11 (26)</td>
<td>9 (47)</td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td></td>
<td>2 (5)</td>
<td>1 (5)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td></td>
<td>1 (2)</td>
<td>1 (5)</td>
<td></td>
</tr>
<tr>
<td>Total MICU Length of Stay (days)</td>
<td>12 ± 9</td>
<td>12 ± 11</td>
<td>.42</td>
<td></td>
</tr>
<tr>
<td>MICU Day at Rehabilitation Psychology Consult (days)</td>
<td>8 ± 5</td>
<td>8 ± 7</td>
<td>.08</td>
<td></td>
</tr>
</tbody>
</table>

Note: p-values calculated using χ² for categorical variables and independent sample t-tests for continuous variables

Role of Psychologists in Critical Care Survivorship

<table>
<thead>
<tr>
<th>Critical Care Guideline Recommendation*</th>
<th>Example of Psychology Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimize Sedation/ Avoid Benzodiazepines</td>
<td>Non-pharmacological, cognitive-behavioral strategies for improved self-management of emotional distress and pain</td>
</tr>
<tr>
<td>Early Rehabilitation</td>
<td>Motivational interviewing for engagement in rehabilitation</td>
</tr>
<tr>
<td>Screen for Delirium</td>
<td>Neurocognitive evaluation; recommendations for environmental and non-pharmacological management</td>
</tr>
<tr>
<td>Family and Patient Support</td>
<td>Education about ICU environment; psychological support</td>
</tr>
<tr>
<td>Inter-disciplinary</td>
<td>Co-treat with ICU clinicians; help team maintain holistic/biopsychosocial view of the patient and family</td>
</tr>
<tr>
<td>Teamwork</td>
<td>*Devin et al., 2018</td>
</tr>
</tbody>
</table>

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
Jane C Whalen, DNP, RN, CCRN, CCNS-CSC
Good Samaritan Hospital, Cardiac Surgery

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?

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 \( p = 0.022 \)
Difference between control, intervention group approached significance for
- Frequency of MD communication \( p = 0.149 \)
- Ease of getting information \( p = 0.152 \)
- Overall score (10 items combined) \( p = 0.129 \)

- 81% of intervention group participants recommended diary

References

Acknowledgements
- With gratitude to Patricia Connor-Ballard PhD, RN; Nancy Steffen 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

**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.
- Peer support groups: Sessions offered once weekly.
- Staff response rates pre and post-implementation.

**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
- Participant feedback: increased family engagement, enhanced communication, increased family knowledge.

**Support Person ICU Recovery Group Feedback**
- n=76
- Staff response rates.

**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.
**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.

**Methods**

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 ≤ 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

**Approach Feasibility Analysis**

<table>
<thead>
<tr>
<th>Scoring Categories</th>
<th>Included (N=142)</th>
<th>Excluded (N=91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worse</td>
<td>Mean Change (SE)</td>
<td>Admit to Discharge</td>
</tr>
<tr>
<td>1</td>
<td>+4.45 (1.47)</td>
<td>CRS-Rblind: +3.61 (0.54)</td>
</tr>
</tbody>
</table>

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

William Siesel, PT, DPT
1 Acute Care Rehabilitation, Johns Hopkins All Children's Hospital, St. Petersburg FL

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.

<table>
<thead>
<tr>
<th>Early Mobility Day #</th>
<th>Activities Performed</th>
</tr>
</thead>
</table>
| Day 1                | • Head of bed elevated to 40 degrees for 20 minutes  
                      | • Resisted lower extremity exercise in bed  
                      | • Fine motor play including painting |
| Day 2                | • Log rolling for donning of TLSO with mod assist  
                      | • Sidelying to sitting transition with max assist x2  
                      | • Sitting edge of bed for 35 minutes with min assist for upright posture  
                      | • Lower extremity active range of motion; long arc quad and ankle pumps  
                      | • Fine motor play including reaching for items on tray table |
| Day 3                | • Log rolling for donning of TLSO with min assist  
                      | • Sidelying to sitting transition with max assist x2  
                      | • Sit to stand x2 with mod assist  
                      | • Pivot transfer to wheelchair with contact guard assist and verbal cuing for hand placement  
                      | • Sat out of bed for 1 hour while performing various upper extremity activities |
| Day 4                | • Log rolling for donning of TLSO with min assist  
                      | • Sidelying to sitting transition with mod assist x1  
                      | • Sit to stand x2 with mod assist  
                      | • 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  
                      | • Sat in wheelchair for 45 minutes and participated in fine motor activities including coloring and stringing beads |

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 Wieczorek et al., discusses benefits of early mobilization as reported in six studies.1 These studies reported improved outcome measures and decreased length of stay for the individuals participating in early rehabilitation.1 They also concluded that these programs are safe and feasible.1 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.

Reference
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.

**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/](http://www.proyectohuci.com/) about this ICU project. Also in national TV, national press media and social networks.

**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.

**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.

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

**Katherine Traditi, PT, DPT**
**NYU Langone Health**

**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 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 global 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.

**OBJECTIVES**
- Mechanical Circulatory Support (MCS) devices function as a bridge to transplant or 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.

**REFERENCES**


Image from: http://www.passy-muir.com/physical_therapy