# POSTER PRESENTATION SCHEDULE

11th Annual Johns Hopkins Critical Care Rehabilitation Conference

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11:30AM - 12:30PM

***Vote for your Favorite Poster Presentation from Friday, November 4, 2022 – PM Session here***
Creation and Implementation of a Multimodal Interdisciplinary ICU Competency

Jenny Logan, PT, DPT, NCS; Lyndsay Laxton, MOT, OTR/L, CBIS; Rebecca Keefer, PT, DPT, CCS

Objective
The purpose of this interdisciplinary quality improvement project was to develop a competency to ensure all ICU-trained PTs and OTs had the required knowledge and skills to practice safely and effectively in ICUs.

Methods
Phase 1: Written multiple-choice exam
- 20 questions
- Patient scenarios requiring clinical decision making
- Created and vetted by content experts

Phase 2: Hands-on simulation
- Mobilizing a mannequin with complex lines/tubes
- Responding to an emergent situation
- Deep suctioning various airways and review of oxygen delivery devices

Results
Participants: 12 OTs, 23 PTs
- Average years of experience: OT 7.8yrs, PT 8.2yrs
- Average years of ICU experience: OT 3.6yrs, PT 4.1yrs
- 100% Pass rate for exam

Conclusions
- The development of an interdisciplinary multimodal competency program successfully assessed and assisted in overall improvement in knowledge and confidence in ICU care for the current cohort of ICU therapists.
- Future considerations include annual frequency, creation of non-ICU content, and focus on emergent situations.

References
Integrating safe patient handling equipment and orthopedic bracing to reduce musculoskeletal injury, increase treatment options, and improve functional mobility for a patient with complex cardiopulmonary disease in the acute care setting: A case study

Gila Akselrad, PT, DPT

Department of Rehabilitation and Regenerative Medicine, NewYork-Presbyterian Hospital, University Hospital of Columbia and Cornell, NY, NY

Background & Purpose

Safe patient handling equipment (SPIE) has been shown to be effective in reducing risk of work-related musculoskeletal injury

Literature (Implementing SPIE to increase treatment options and improve functional mobility in the acute care setting is sparse). Complex decision-making is required to appropriately select and utilize SPIE.

Case Description

Patient Background:
- 54-year-old female
- Prior Level of Function: Independent
- Lives in an elevator apartment with her family

Chief Complaint:
- Clogged PICC

Plan of Care:
- Upgrade heart-kidney transplant status

Past Medical History:
- Left Ventricular Assist Device (LVAD)
  - Heartware (2017)
- Heart failure reduced ejection fraction (EF) 8%
- Endocarditis
- Cardiomyopathy
- Factor V Deficiency
- Acute on chronic renal failure
- Idiopathic gout
- Hyperthyroid

Timeline

<table>
<thead>
<tr>
<th>Administration</th>
<th>Dependent Stand</th>
<th>Integrating SPHE: Arjo Sara Study™ + Knee Immobilizer</th>
<th>Integrating SPHE: Platform Rolling Walker + Knee Immobilizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC: Clogged PICC, Update of heart-kidney transplant status</td>
<td>Sit to stand (STS): Maxed2 with constant manual feedback to block L1L1 from buckling.</td>
<td>Hospital Day 80</td>
<td>Hospital Day 90</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital Day 20 &amp; 51</td>
<td></td>
<td>Hospital Day 91</td>
<td>Hospital Day 90</td>
</tr>
</tbody>
</table>

Interventions

- Strengthening
- Neuromuscular Re-education
- Standing Tolerance
- Gait Activities

Mobility Progress

Pre/Post SPIE & Bracing Utilization

Bedside Mobility Assessment Tool (BMAT)

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Max Assist</th>
<th>Walk 25 FEET</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2</td>
<td>Mod Assist</td>
<td>Stand 1 MINUTE</td>
<td>8</td>
</tr>
<tr>
<td>Level 3</td>
<td>Mod Assist</td>
<td>Chair Transfer</td>
<td>4</td>
</tr>
<tr>
<td>Level 4</td>
<td>Min Assist</td>
<td>Bed Turn Self Activity</td>
<td>2</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

References

Is agitation a serious problem in the critical care patient? Prospective study in two phases in a Latin American Intensive Care Unit.

Background in Uruguay

In Uruguay the use of the Richard Agitation Sedation Scale (RASS) and the Escalation Assessment Method for the Intensive Care Unit (ESAM-ICU), is not systematically incorporated in the clinical practice. In 2011-2012, the first prospective study on agitation and delirium in the ICU was carried out in the private hospital, which revealed an incidence of agitation of 65% in mechanical ventilated (MV) patients, tobacco use, delirium and MV hospital stay longer than 48 hours and mortality and comparing it with the previous post educational intervention period.

In the subsequent period, educational intervention was implemented to bring the team in the use of these tools.

METHODS

Descriptive, prospective study of patients admitted to the Partner Hospital ICU between March 1, 2011 to December 31, 2011.

Inclusion criteria: - Age > 18 - Length of stay > 24 h - Systolic BP > 100 mm Hg

Exclusion criteria: - Nonmechanical mechanical ventilation (NMMV), coming from another medical facility requiring more than 10 hours after discharge - Patients with severe neuroaxial or neurosurgical pathology

was diagnosed when the RASS scale was > 1.

Diagnosis was determined when the CHI was positive.

RESULTS

UNIVARIATE ANALYSIS

Three groups comparing agitated with non-agitated patients on several clinical variables (2011 study).

**Variables**
- Age
- Delirium
- Tobacco use
- Psychotropic use
- Vasoactive use
- Inotropic use

**RESULTS**
- Age: 50.8 (38.4-64.9) p = 0.004 0.6
- Delirium: 0.87 (0.50-1.53) p = 0.6
- Vasoactive use: 0.70 (0.52-1.00) p = 0.03
- Psychotropic use: 0.53 (0.33-0.88) p = 0.02
- Inotropic use: 1.12 (0.53-2.39) p = 0.7
- Tobacco use: 0.69 (0.43-1.14) p = 0.11
- Other psychotropic use: 0.57 (0.38-0.90) p = 0.03

**MULTIVARIATE ANALYSIS**

Three variables with a significance level ≤ 0.20 and those considered clinically relevant were included in the multivariate analysis:
- Male gender
- Tobacco use
- Admission to RASS > 0

Conclusions

The best tool for Oliguria diagnosis and treatment is to recognize associated risk factors.

REFERENCES


ICU Diaries: Constructing a Narrative of Patient’s and Family Members’ Experiences

Nicole D. Rosenbaum, OTD, OTR/L, CPAM
Kelly S. Casey, OTD, OTR/L, BCPR, ATP, CPAM

Background

- The ICU can be a traumatic experience for patients and families, resulting in short- and long-term impairments.
- ICU Diaries are client-centered journals that provide patients and families with a collection of events that helps improve recall.
- The use of ICU Diaries increases understanding and accurate recall of the ICU experience, importance of family involvement and assists in patient recovery.
- Successful implementation of ICU Diaries involves collaboration and effort with the interdisciplinary team, which further humanizes the ICU experience for patient’s and their family members’.

Current Clinical Relevance:

<table>
<thead>
<tr>
<th>During ICU Stay</th>
<th>Post ICU Stay</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adverse effects on patient and family members.</td>
<td>• 6 months post discharge...</td>
</tr>
<tr>
<td>• PICS/PICS-F (15-50%)</td>
<td>• PTSD (25%)</td>
</tr>
<tr>
<td>• Cognitive impairments (30-80%), including delirium</td>
<td>• Depression (34%)</td>
</tr>
<tr>
<td></td>
<td>• Anxiety (40%)</td>
</tr>
<tr>
<td></td>
<td>• False memories or “Memory Gaps” (30-70%)</td>
</tr>
</tbody>
</table>

Benefits of ICU Diaries

- Reduce risk of solidified false memories
- Validate patient’s and family members’ ICU experience
- Decrease occurrence of psychosocial stressors
- Enhance communication with patient’s, family members and interdisciplinary team

ICU Diary Implementation

- Possible Barriers → Suggested Solutions:
  - Legal Implications: Separate from medical record
  - Time Constraints: Entries require <5 minutes
  - Quality and Logistics: Consistent outline
  - Transparency with patients and families Completed by any member of interdisciplinary team
  - Ensure jargon-free language

Clinical Implications:

- ICU Diaries are a supportive tool in preventing or reducing trauma, distress, and adverse long-term effects for patient’s and family members’ following an ICU stay.

Occupational Therapy Practitioners Role with ICU Diaries:

- Overview of OT Role in ICU:
  - Holistic, client-centered approach to occupational performance
  - ICU Environment → risk for decrease in occupational engagement

- Specific to Implementation of ICU Diaries:
  - Promote sensory integration
  - Enhance cognition (reorientation, establish reality awareness, memory recall, sustained attention to task and temporal context)
  - Challenge neuromuscular function

References:

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5885274/
- https://doi.org/10.1097/01.NCC.00005885274
Dose of Physical Rehabilitation in Mechanically Ventilated Patients: A Scoping Review
Omar Almaadawy, MBBC, Mounika Lakshmalla, MBBS, Vasudha Maddukuri, MBBS, Pooja Kota, MBBS, Sravya Vellanki, MBBS and Stephanie Hiser, PT, DPT

**Objective**
Explore how early rehabilitation interventions among mechanically ventilated patients are described in literature:
1. Intended intervention
2. Delivered intervention

**Methods**
Identification of eligible studies:
- Studies up to June 17, 2021
- Multiple databases.
- Inclusion criteria: Any design (except for qualitative or survey-based); MV adults (>18); receiving early mobilization/rehabilitation
- Abstract and full-text screening performed by 2 independent reviewers (via Covidence)

Data abstraction
- Completed by two reviewers with discrepancies resolved through consensus by the authors

Data analysis
- All data was categorical and analyzed as counts (%).

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### Results

- 25,817 were screened, 774 full text publications were reviewed
- 148 eligible studies were included

#### Time of initiation from MV

<table>
<thead>
<tr>
<th>Time of initiation from MV</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not reported</td>
<td>19 (13)</td>
</tr>
<tr>
<td>ICU Admission</td>
<td>5 (3)</td>
</tr>
<tr>
<td>Within 24 hr</td>
<td>8 (2)</td>
</tr>
<tr>
<td>After 24 hr</td>
<td>19 (13)</td>
</tr>
<tr>
<td>Within 48 hr</td>
<td>20 (14)</td>
</tr>
<tr>
<td>After 48 hr</td>
<td>15 (10)</td>
</tr>
<tr>
<td>Within 72 hr</td>
<td>11 (7)</td>
</tr>
<tr>
<td>After 72 hr</td>
<td>4 (3)</td>
</tr>
<tr>
<td>Pt assessment dependent</td>
<td>9 (6)</td>
</tr>
<tr>
<td>Other</td>
<td>37 (25)</td>
</tr>
</tbody>
</table>

#### Frequency of intervention

<table>
<thead>
<tr>
<th>Frequency of intervention</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single session</td>
<td>10 (7)</td>
</tr>
<tr>
<td>Once daily</td>
<td>49 (33)</td>
</tr>
<tr>
<td>Twice daily</td>
<td>25 (17)</td>
</tr>
<tr>
<td>Not reported</td>
<td>45 (30)</td>
</tr>
<tr>
<td>Other</td>
<td>19 (13)</td>
</tr>
</tbody>
</table>

#### Study type

<table>
<thead>
<tr>
<th>Study type</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCT</td>
<td>52 (36)</td>
</tr>
<tr>
<td>Case Study/Case Series</td>
<td>20 (14)</td>
</tr>
<tr>
<td>Before-After Study/Non-RCT</td>
<td>16 (11)</td>
</tr>
<tr>
<td>Retrospective Cohort</td>
<td>15 (10)</td>
</tr>
<tr>
<td>Other</td>
<td>17 (11)</td>
</tr>
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</table>

#### Measurement of intensity "n=43"

<table>
<thead>
<tr>
<th>Type of intensity</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive or active</td>
<td>28 (65)</td>
</tr>
<tr>
<td>CNRES</td>
<td>15 (35)</td>
</tr>
<tr>
<td>Cycle ergometry</td>
<td>16 (37)</td>
</tr>
<tr>
<td>Multicomponent</td>
<td>7 (16)</td>
</tr>
</tbody>
</table>

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### Conclusion

- Complete reporting of intended and actual intervention delivered is infrequent.
- To determine optimal intervention parameters, we need to improve reporting and use standardized reporting guidelines in order to provide a thorough description of study interventions.

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**Legend**
- Progressive mobility
- Multicomponent
- Cycle ergometry
- CNRES
- Passive or active exercise
- Type of intensity
- Adjusting frequency
- Physiological data
- Subjective report
- Repetitions of an exercise
- O2 consump.
- Oxidative stress
The Utilization of Occupational Therapy Interventions within a Pediatric Hematology/Oncology Intensive Care Unit

St Jude Children’s Research Hospital
Lucy Weathers, OTR/L, Sarah Schwartzberg, OTR/L, Saad Ghafoor, MD
Contact: Lucy.Weathers@stjude.org, Sarah.Schwartzberg@stjude.org, Twitter: @OT_Sarah_PedOnc

BACKGROUND
Occupational therapists aim to improve functional outcomes following discharge from intensive care units in adult and pediatric populations but has limited research in children with cancer. Specifically, the impact of occupational therapy (OT) interventions within a pediatric intensive care unit (PICU) is not well understood. The purpose of this study is to describe the role of OT and types of interventions performed within a PICU setting and to evaluate the utilization of OT services in an early mobility program.

OBJECTIVES
1. To describe the utilization of occupational therapy within early mobility initiatives in a PICU.
2. To describe what types of occupational therapy interventions can be utilized within a PICU.
3. To describe adverse events, if any, that occurred during occupational therapy interventions in a PICU.

METHODS
A retrospective review of the BRAVE (Beginning Restorative Activities Very Early) early mobility program occurred between January 2019 and June 2020 comparing OT interventions pre-implementation (January-September 2019) and post-implementation (October 2019-June 2020). Demographics and OT interventions were obtained from medical records.

RESULTS
OT interventions reviewed included: passive range of motion (ROM), passive bed positioning, splinting, active ROM, active bed positioning, sitting edge of bed, sensory stimulation, relaxation techniques, sit to stands, edema management, mobility devices, transfers (bed, mat, caregivers’ arms), pre-gait activities, ambulation, therapeutic play/activities, self-care training, function, position devices, and physical performance tests.

Occupational therapy services increase from 56 patients pre-implementation to 83 post implementation.

There were no adverse events including unplanned extubations or injury to patients/staff. COVID-19 directly impacted staffing which may have affected post-implementation results.

<table>
<thead>
<tr>
<th>Statistically Significant Interventions</th>
<th>Clinically Meaningful Increases in Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Active ROM</td>
<td>46.2%</td>
</tr>
<tr>
<td>Physical Performance Tests</td>
<td>33.93%</td>
</tr>
<tr>
<td>Active Bed Positioning</td>
<td>41.07%</td>
</tr>
<tr>
<td>Spilling</td>
<td>7.14%</td>
</tr>
</tbody>
</table>

Table 1: Directionality of Statistically Significant Interventions (Pre- and Post- Implementation Periods)
Table 2: Percentage of total patients receiving intervention during pre- and post- implementation periods

CONCLUSION
OT plays a key role in early mobility and is safe to perform in the PICU with hematology/oncology patients. Interventions did not increase adverse events such as unplanned extubations or injury to staff/patients. Further research is warranted to evaluate the effectiveness of specific OT interventions on functional outcomes.

REFERENCES
Using Online Learning and Structured Mentorship to Prepare Occupational Therapists for the Neurology ICU: A Case Study

Jessie Franco1, OTD & Kathryn Ellis2, OTD

MGH INSTITUTE OF HEALTH PROFESSIONS
BOSTON, MA

INTRODUCTION

The ICU is a challenging practice setting that requires OT practitioners to have basic medical knowledge, safety awareness, strong clinical reasoning skills, and confidence. However, a standardized training program does not exist causing many practitioners to feel overwhelmed and unprepared to practice in this dynamic setting.

BACKGROUND

- Only 40% of US hospitals implement early rehabilitation & mobility programs1; 34% of ICUs have dedicated therapy staff2, & only 49% of patients receive OT while in the ICU.
- Many ICU care providers are not accustomed to using OTs and are unaware of their role & benefits3.
- Providing optimal care in the ICU requires advanced skill sets, which are not often taught in academic settings and not easily gained through typical acute care experiences4.
- Many practitioners report insufficient knowledge and hands-on training during school, negatively impacting clinical judgment and confidence5.
- OT practitioners have a critical role in medically complex settings, yet a lack of knowledge may lead to a chronic and reduced presence of OT in the ICU6.
- Numerous attempts have been made to address this professional practice problem; however, implementation and standardization within practice ICU care remains.

OBJECTIVE

This pilot study aimed to examine the feasibility and effectiveness of self-paced online learning and structured mentorship for the neurology ICU to increase knowledge and confidence.

METHODS

- **Design:** Non-controlled pre-test/post-test case study
- **Setting:** Level I Trauma Center in Boston, MA
- **Participants:** Occupational therapists (n=3) with a minimum of 6 months of experience working in the acute hospital setting
- **Intervention:** Completion of self-guided online learning modules paired with structured mentorship and hands-on learning over a 5-week period
- **Main outcomes measured:** Change in knowledge as scored on a pre-post knowledge assessment and confidence as reported on a self-report

CONCLUSION

Self-paced learning via an innovative website, was able to fill knowledge gaps and cultivate critical thinking. Structured mentorship allowed participants the opportunity to directly apply and generalize learning for skill development with feedback from their mentor. Participants felt the education and mentorship complimented each other well and was beneficial to learning.

Though initial data was positive, further research is required with a larger sample size, inclusion of other types of ICUs, and expansion to other hospitals. Additionally longer-term assessment is also required to determine retention of knowledge and sustained impact and adoption of OT in the ICU setting. The website and training approach could serve as a model for smaller hospitals that do not have the resources or staff to support a more traditional learning and development program.

REFERENCES