POSTER PRESENTATION SCHEDULE

11th Annual Johns Hopkins Critical Care Rehabilitation Conference

Time	Presentation Order	Presenter	Author(s)	Title	Institution
Facilitator - Hallie Lenker, Co-Moderator - Audun Huslid					
Saturday, November 5th, 2022 - PM Session					
12:15PM - 1:15PM	1	Gabrielle Romano	Gabrielle Romano, PT; Vanessa Lee, PT; Sheena MacFarlane, PT	Physical Therapy Interventions with a Patient After Orthotopic Heart Transplantation in the Acute Care Setting: A Case Report	Temple University Hospital
	2	Caitlyn Anderson	Caitlyn Anderson, PT, DPT, NCS, GCS, Brandon Bigelow, SPT, Demotris DeValk, SPT, Tanner Helgeson, SPT	A Closer Look at Covid-19: The Global Rehabilitation Response for Patients Hospitalized with Moderate to Severe Disease	University of Wisconsin-Milwaukee
	3	Kyle J. Wikfors	Kyle J. Wikfors, PT, DPT, NCS	Neurological complications in an adult patient treated with extracorporeal membrane oxygenation (ECMO) after double lung transplant – recovery is more than just breathing exercises – a case study	New York Presbyterian Columbia Irving Medical Center
	4	Juliana Cooper	Juliana Cooper, PT; Amanda Del Rosario, OTR/L	Standardization of Education for Occupational and Physical Therapists Caring for Patient with Mechanical Circulatory Device Support (ECMO, IABP, & Impella)	Sharp Healthcare
	5	Tammy Camelli	Tammy Camelli DNP, CNP AC-PC, Jean Christopher CNS, MSN, Stephanie Noble, PT, DPT, Katie Clark, OT, Katy Howell, RN, BSN, Micah Baird, MD, Christopher Page-Goertz, MD, FAAP,Mira Brown, MS	Early mobility in the Pediatric intensive care unit (PICU): Impact of standardized program	Akron Children's Hospital
	6	Mazin Ali Mahmoud	Mazin Ali Mahmoud, M.D., Omar Ahmed Abdou Almaadawy, M.D., Arooj Fatima, M.D., Renee D. Stapleton, M.D., Ph.D., Daren Heyland, M.D., MSc, FRCPC., Victor D. Dinglas, MPH., Dale M. Needham, M.D., Ph.D.	Change in Repeated 6-Minute Walk Distance Tests Near Time of Hospital Discharge for Acute Respiratory Failure Patients	Johns Hopkins University, School of Medicine
	7	Emily Kavanaugh	Emily Kavanaugh, PT, DPT, MBA	Case study as demonstration of methodology for patients with severe ICU-Acquired weakness and cognitive impairment for successful extubation and functional progression	First Health of the Carolinas

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Physical Therapy Interventions with a Patient After Heart Transplantation (HT) in the Acute Care Setting: A Case Report

Gabrielle Romano, PT, DPT[1]; Vanessa Lee PT, DPT, DPT, CCS[2]; Sheena MacFarlane, PT, DPT, CCS[3]

1 – Temple University Hospital, Physical Medicine and Rehabilitation, Philadelphia, PA, 2- Messiah University, School of Graduate and Professional Studies, Mechanicsburg, PA, 3 - Rutgers University, The State University of NJ - Doctor of Physical Therapy Program, NJ

Introduction and Background:

- The frequency of heart transplantation in the United States has increased by 39% over the last 10 years.
- Most research for PT after HT addresses outpatient cardiac rehabilitation; there is limited research in acute care setting
- PURPOSE: Describe the PT interventions, plan of care, and associated outcomes in an acute care setting for a patient after HT.

Case Report:

- 60-year-old male received a HT
- PT was initiated 3 days postoperatively
- Total acute care PT course included 14 sessions over 22 days
- Outcome measures used: JH-HLM, 6MWT, Berg Balance Scale

Discussion:

Acute care PT is feasible, safe, and effective to improve functional capacity and aerobic capacity as demonstrated by the patient in this case.

This case report describes PT practice for HT recipients in the acute care setting, including intervention prescription, progression, and use of outcome measures. It can be used to inform future practice and research.

Legend:

PT: physical therapy
HT: heart transplant
MDC: minimal detectible change
MCID: minimal clinically important difference
JH-HLM: John Hopkins Highest Level of Mobility
6MWT: Six Minute Walk Test
RPE: Rating of Perceived Exertion

Figure 1: PT Findings and Interventions Post Heart Transplant

PT Evaluation Findings:

- Impaired postural awareness
- Poor seated balance requiring Min A to Mod A
- Decreased proximal muscle strength
- Sitting tolerance: 12 minutes
- Unable to complete sit to stand transfer

1st week (4 sessions)

- Function:
  - Edge of bed training
  - Out of bed to chair
  - Pre-gait activities
- Strength:
  - Seated exercise, 1 set, fatigue-limited
  - Focus on lower extremity muscle groups

2nd week (5 sessions)

- Function:
- In-room and household distance ambulation
  - RPE 13-15
- Strength:
  - Seated and standing, 1-2 sets
  - 11-14 RPE
  - Added upper extremity muscle groups

3rd Week (5 sessions)

- Function:
  - Community distance ambulation
  - Stair training
  - RPE 13-15
- Strength:
  - Added external resistance
  - Continued RPE of 11-14
- Balance training:
  - Static exercises in standing

Final PT session:

- Walked 612 feet (187 meters)
- Berg Balance Scale: 35/56
- Discharge Recommendations:
  - Home PT
  - Rollator
  - Home safety education

Education Topics: Sternal precautions, Breathing re-training, Use of RPE scale, Warm up and cool down exercises, Home Exercise Program, Fall prevention program, & Assistive device use

Chart 1: Functional Improvement in JH-HLM Score

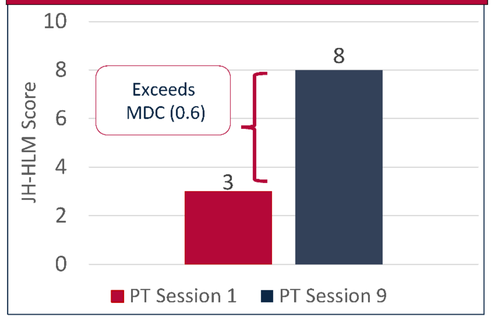
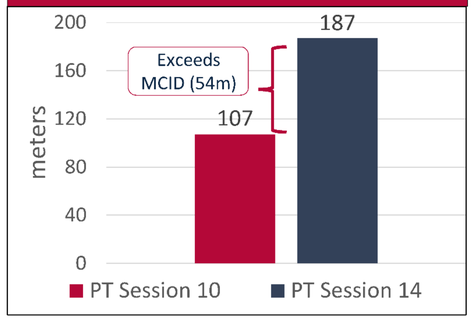


Chart 2: Improvement in Ambulation Distance on 6MWT



A Closer Look at Covid-19: The Global Rehabilitation Response for Patients Hospitalized with Moderate to Severe Disease

Brandon Bigelow[1], SPT, DJ De Valk[2], SPT, Tanner Helgeson[3], SPT
Faculty Advisor: Caitlyn Anderson[4], PT, DPT, NCS, GCS
[1]University of Wisconsin-Milwaukee

Background

Recommendations for physical therapy (PT) rehabilitation protocols for patients (pts) hospitalized with Covid-19 continues to demonstrate extreme variability, especially those with moderate to severe disease. Additionally, regional differences in Covid-19 response may play a role in decreased congruity of practice.

Purpose

The goal of this search is to review existing literature stemming from **different regions** regarding:

- PT intervention selection and rationale
- Discharge (DC) destinations
- Utilization of outcome measures

To observe trends and provide best practice recommendations

Methods

The Population, Intervention, Comparison and Outcome (PICO) method was used.

Four authors independently screened titles and abstracts of all studies

Studies were eligible if:

1. Pts were hospitalized due to Covid-19 and participated in PT
2. Pts were categorized as moderate, severe, or critical
3. The article was written in English. Two separate searches were conducted between October 2021 and March 2022 to reflect the emerging nature of information. **Of the 139 total papers identified, 35 met inclusion criteria.**

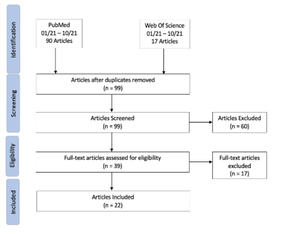


Figure 1

PRISMA Flow Chart Jan. 2021 – Oct. 2021

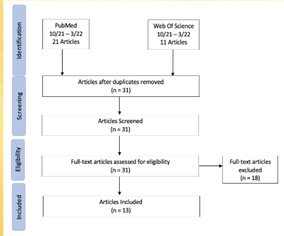


Figure 2

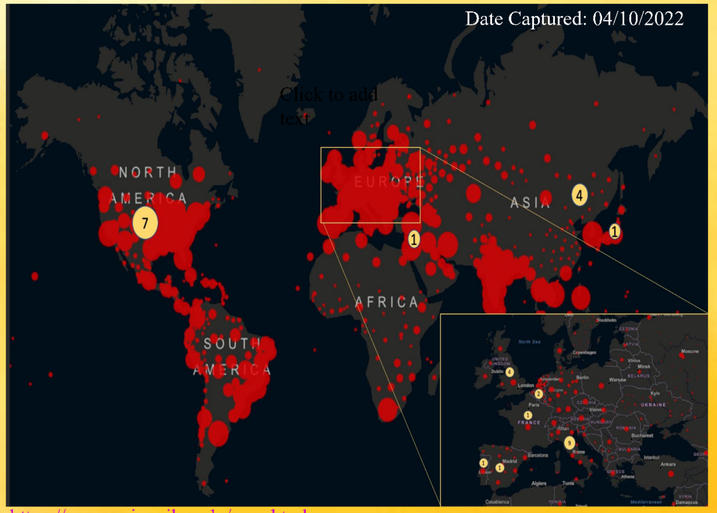
PRISMA Flow Chart Oct. 2021 – Mar. 2022

Results

- **18/35** articles outlined interventions *beyond* early mobilization.
- **17/35** articles documented outcome measure use, with just **7/35** using American Physical Therapy Association (APTA) recommended measures for Covid-19.
- Discharge recommendations with skilled rationale were listed in **8/35** studies, ranging from discharge to home to a rehabilitation center for regular PT.
- Top locations for dissemination of research were **Italy, the United States (US), United Kingdom (UK), and China.**

Figure 3

Global Map of References by Location



https://coronavirus.jhu.edu/map.html

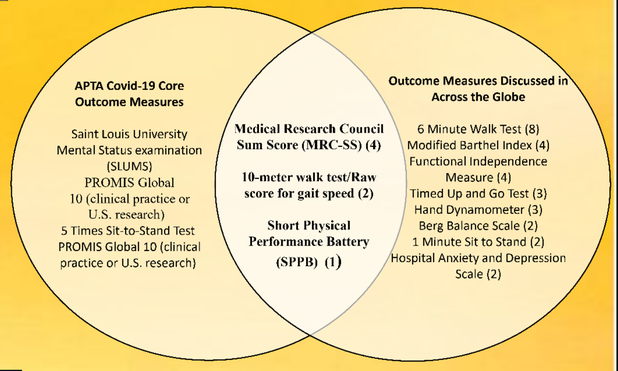
Table 1

Infection rates amongst most popular article retrieval locations

Location	Infection Rates	Articles Retrieved
Italy	16.1 Million	9
United States	80.9 Million	7
United Kingdom	22 Million	4
China	0.748 Million	4

Figure 4

APTA Measures Compared to Resource Utilization



Discussion

PT services were accepted to be beneficial across all hospital settings with promotion of early mobilization

Key medical chart review and mobilization protocols to guide specific intervention selection were **not** discussed.

Active Cycles of Breathing technique, inspiratory muscle training, and prone positioning were common ventilatory strategies performed globally.

Lack of DC destination recommendations with skilled rationale was surprising and may play a role in the now **high prevalence of post-Covid and post-ICU syndromes.**

US-authored publications used 0 APTA recommended OMs. The top OM used globally was the **6-minute walk test** followed by equal utilization of the **Functional Independence Measure (FIM), MRC sum score, and Modified Barthel index.**

Conclusion

Limited evidence exists to guide clinicians in managing pts with are critically ill with Covid-19 despite an expanding body of literature. Future, pointed research is warranted to provide recommendations specific to the pathophysiology of Covid-19 and continuum of care.

References Code

Neurological complications in an adult patient treated with extracorporeal membrane oxygenation (ECMO) after double lung transplant – recovery is more than just breathing exercises – a case study

Kyle J. Wikfors, PT, DPT, NCS
Department of Physical Therapy, New York Presbyterian Columbia University Irving Medical Center, New York, NY

Background & Purpose

Lung transplant remains an important therapeutic option for individuals with advanced pulmonary disease.[3] Neurological complications including stroke (CVA) as well as critical illness polyneuropathy/myopathy (CIP/CIM) are common in patients after transplant.[2-4] These complications contribute to increased hospital stay and early morbidity and mortality.[2-4] They are also frequently seen in patients requiring ECMO support, of which is commonly used in patients after transplant.[1-6] Early mobilization in the intensive care unit (ICU) is safe and feasible for patients after lung transplant, however there is limited data regarding the clinical implications of neurological complication after lung transplant including the effect on physical therapy (PT) plan of care and intervention.[5] This purpose of this case study was to report the role of PT in the recovery of a patient with unique neurological complications after lung transplant.

Case Description

Patient Background:
- 50-year-old female
- Lives in a 4th floor walk-up apartment with her spouse
- Prior level of function: Independent with supplementary oxygen

Chief Complaint:
- Transplant status

Plan Of Care:
- Lung transplant

Past Medical History:
- Congestive heart failure
- Pulmonary hypertension
- Ventricular septal defect
- Eisenmenger's syndrome

Post-Operative Complications:
- Intra-op bleeding requiring ECMO
- Respiratory failure with prolonged mechanical ventilation
- Recurrent MSSA
- AF RVR
- Left thalamic infarct
- TIA
- Critical illness myopathy/polyneuropathy

PT Examination (12/13/2021)

ROM: Within normal limits
Strength:
- Right upper extremity: 1/5 throughout
- Left upper extremity: 1/5 throughout
- Right lower extremity: 0/5 throughout
- Left lower extremity: 0/5 throughout

Sensation: Within normal limits, except:
- Light touch: Impaired below right knee and left ankle
- Pin prick: Intact throughout

Proprioception: Impaired below ankle bilaterally
Cognition: AAOx1, short term memory loss, lethargic, follows one-step commands

Hospital Course

11/16/2021	Double lung transplant & ECMO cannulation.
11/26/2021	Chest closure and tracheostomy.
12/04/2021	ECMO decannulation.
12/13/2021	PT initial evaluation.
01/02/2022	CT scan with age indeterminate left thalamic CVA.
01/17/2022	Admitted to step-down unit.
01/29/2022	Stroke code called for new aphasia.
02/23/2022	EMG study performed.
03/14/2022	Tracheostomy decannulated.
04/22/2022	Admitted to rehab unit.
05/20/2022	Re-admitted to step-down unit. PT re-evaluation completed.
06/04/2022	Stroke code called for altered mental status and L facial droop.
06/14/2022	Patent foramen ovale (PFO) closure.
06/25/2022	Patient admitted to rehab unit.

Figure 1. Patient hospital course consisting of 221 days in the cardio-thoracic ICU, step down unit, and inpatient rehab unit, respectively.

Figure 2. VitalGo Total Lift ICU standing bed utilized in PT interventions from 12/30/2021 to 4/21/2021.

PT Intervention

Frequency:
- 5-6 days/week for 19 weeks
- 30-45 minutes/day

Method & Setting:
- Performed bedside
  - Cardio-thoracic ICU (11/16/2021-1/16/2022)
  - Step-down unit (1/17/2022-4/21/2022) (5/20/2022-6/24/2022)

Interventions:
- Respiratory training
  - Diaphragmatic breathing
  - Incentive spirometry
- Postural control training in sitting and supported stand
- Standing tolerance training/LE strengthening via VitalGo Total Lift ICU standing bed (Figure 2)
- Therapeutic exercise
- Transfer and gait training with LE bracing and platform/rolling walkers

Patient Progress via AM-PAC "6 Clicks"

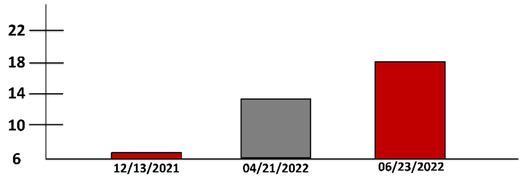


Table 1. AM-PAC "6-Clicks" raw scores on initial evaluation, re-evaluation, and discharge, respectively.

Discussion

Neurological complications including stroke, CIP, and CIM may present simultaneously after lung transplant resulting in increased patient debility and hospital length of stay.[2-4] In conclusion, this case study highlights how these complications may effect patient recovery as well as PT plan of care and intervention in the ICU and acute care settings, specifically demonstrating use of environmental adaptations and clinical expertise in neurological and cardiopulmonary practice areas.

Clinical Implication

Clinicians should note that neurological complications are common after lung transplant and ECMO support. PT intervention should be adapted to accommodate for the impairments that come with these complications.

References

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2. Gamez J, Salvado M, Martinez-de La Ossa A, Deu M, Romero L, Roman A, et al. Influence of early neurological complications on clinical outcome following lung transplant. PLoS ONE 2017; 12(3): e0174092.
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Standardization of Education for Occupational and Physical Therapists Caring for Patients with Mechanical Circulatory Device Support (ECMO, IABP, Impella)

Juliana Cooper, PT, DPT, & Amanda Del Rosario, OTR/L

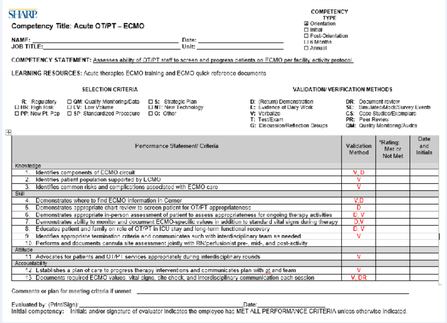
Sharp Memorial Hospital, San Diego, CA

INTRODUCTION

- The acute Occupational Therapy (OT) and Physical Therapy (PT) departments at Sharp lacked standardized education or mobility protocols for working with patients with mechanical circulatory support (MCS) devices.
- The COVID-19 pandemic and changes to the UNOS cardiac transplant criteria led to increased numbers of patients on MCS. Historically, patients were kept on bedrest for the entirety of device support.
- Literature states prolonged bedrest and lack of mobility contribute to increased muscle wasting, risk of skin breakdown, and decreased independence.[1]

OBJECTIVE

- Develop and implement evidence based standardized mobility protocols, education, and competencies for OT/PT staff who care for critically ill patients with MCS devices.
- Increase staff self-efficacy (GSE scores) when working with this population.
- Increase knowledge and confidence among OT/PT staff to facilitate successful implementation of an evidence-based mobility program for patients who otherwise would have experienced prolonged bedrest.



SHARP

Competency Title: Acute OT/PT – ECMO

COMPETENCY TYPE: ☑ Orientation ☐ Annual ☐ Role Orientation ☐ Life Months ☐ Annual

NAME: _____ Date: _____
JOB TITLE: _____ Units: _____

COMPETENCY STATEMENT: Assesses ability of OT/PT staff to screen and progress patients on ECMO per facility activity protocol.

LEARNING RESOURCES: Acute therapies ECMO training and ECMO quick reference documents

SELECTION CRITERIA
R: Regulatory — ☐ QM: Quality Monitoring/Data; ☐ S: Strategic Plan
U (Hi): High Risk — ☐ LV: Low Volume; ☐ NT: New Technology
D PP: New Pt Pop — ☐ ST: Standardized Procedure; ☐ O: Other

VALIDATION/VERIFICATION METHODS
D: (Return) Demonstration; DR: Document review
E: Evidence of Daily Work; SE: Simulation/Actual Survey Events
V: Verbalization; CS: Case Studies/Scenarios
T: Test/Exam; OV: Observation
C: Discussion/Reflection Groups; QM: Quality Monitoring/Audits

Performance Statement/ Criteria	Validation Method	Rating: Met or Not Met	Date and Initials
Knowledge			
1. Identifies components of ECMO circuit	V, D		
2. Identifies patient population supported by ECMO	V		
3. Identifies common risks and complications associated with ECMO care	V		
Staff			
4. Demonstrates where to find ECMO information in Connect	V, D		
5. Demonstrates appropriate chart review to screen patient for OT/PT appropriateness	D		
6. Demonstrates appropriate in-person assessment of patient to assess appropriateness for ongoing therapy activities	D, V		
7. Demonstrates ability to monitor and document ECMO-specific values in addition to standard vital signs during therapy	D,V		
8. Educates patient and family on role of OT/PT in ICU stay and long term functional recovery	D, V		
9. Identifies appropriate termination criteria and communicates such with interdisciplinary team as needed	V		
10. Performs and documents cannula site assessment jointly with RN/perfusionist pre- mid- and post-activity			
Affiliate			
11. Advocates for patients and OT/PT services appropriately during interdisciplinary rounds	V		
Accountability			
12. Establishes a plan of care to progress therapy interventions and communicates plan with pt and team	V		
13. Documents required ECMO safety, vital signs, site check, and interdisciplinary communication each session	V, DR		

Comments or plan for meeting criteria if unmet: _____

Evaluated by: (Print/Sign) _____ Date: _____
Initial competency: Initials and/or signature of evaluator indicates the employee has MET ALL PERFORMANCE CRITERIA unless otherwise indicated.

Figure 1: ECMO competency

METHODS

Collaboration with hospital MCS team, cardiopulmonary team, and with MCS specialists and OT/PTs around the country to develop standardized evidence-based mobility protocols

Mobility protocols developed through this project:

- IJ Extra-corporeal membrane oxygenation (ECMO)
- Femoral ECMO
- Axillary/subclavian intra-aortic balloon pump (IABP)/Impella
- Femoral IABP/Impella

Competencies developed:

- IJ ECMO (Figure 1)
- Femoral ECMO
- Femoral IABP/Impella
- Axillary/subclavian IABP/Impella

Figure 2: First femoral IABP patient mobilized at Sharp

Staff training provided:

- IABP/Impella class
- ECMO class
- One to one mentorship with completion of competency check-off for each of the four populations listed above

Data collection:

- Pre- and post-education knowledge test
- Pre-, post-, and 3-month follow-up using the validated General Self-Efficacy Scale [2]

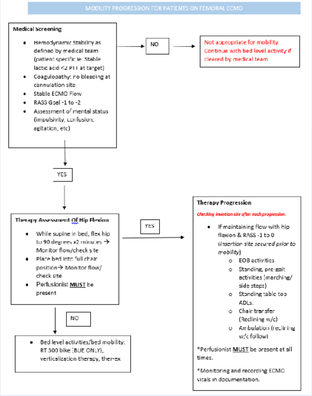
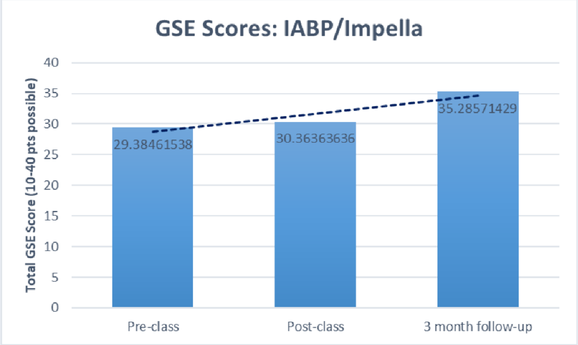


Figure 3: Mobility Progression for Patients on Femoral ECMO

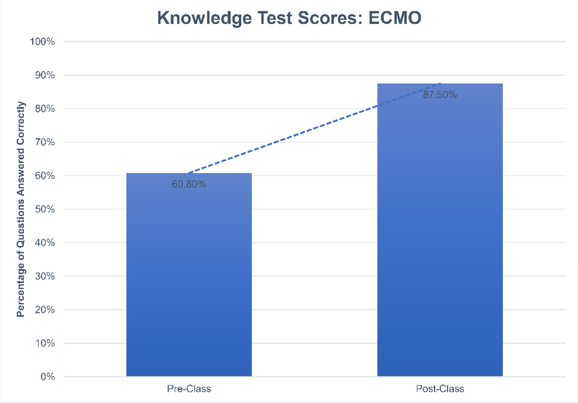
RESULTS

Following standardized training, the ECMO and IABP/Impella cohorts demonstrated increases in self-efficacy, with mean GSE scores increasing from:

- 29.4 (pre-class) to 35.3 (3 month follow-up) for Impella/IABP
- 31.9 (pre-class) to 35.1 (3 month follow-up) for ECMO



Staff knowledge scores improved from 60.8% to 87.5% (ECMO) and 53.8% to 77.5% (IABP/Impella).



CONCLUSIONS

Implementation of standardized mobility protocols, staff training, and one to one mentorship resulted in increased staff knowledge of safe management of patients with MCS devices. Additionally, increased GSE scores demonstrate improvements in staff's perceptions of self-efficacy. In turn, these increases in knowledge and confidence in applying this information allowed the team to implement an evidence-based mobility program for patients who otherwise would have experienced prolonged bedrest.

Future opportunities exist to look at early mobility and the correlations to delirium prevention and hospital LOS.

Figure 4: First ambulatory ECMO patient at Sharp

REFERENCES

1. Ramsey SC, Lucas J, Barrett P, Ballard WL, Kaul P, Klein AJ. Safe Ambulation of Critically Ill Cardiac Patients With Femoral Balloon Pumps: A Case Cohort Study. J Card Fail. 2020 Jul;26(7):621-625. doi: 10.1016/j.cardfail.2020.05.010. Epub 2020 May 21. PMID: 32446947.

2. Schwarzer R. The General Self-Efficacy Scale. http://userpage.fu-berlin.de/health/engscal.htm. Accessed July 20, 2021.

CONTACT INFO

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Early Mobility In The Pediatric Intensive Care Unit (PICU): Impact Of A Standardized Program

Tammy Camelli DNP, CPNP AC-PC, Katie Clark, MOT, OTR/L, Stephanie Noble, PT, DPT, Kathyn Howell BSN, RN, CCRN-K, CPN, Jean Christopher, MSN, APRN-CNS, FCNS, Micah Baird, MD, Christopher Page-Goertz MD, FAAP, Miraides Brown, MS
Akron Children's Hospital, Akron, Ohio

Akron Children's Hospital

Background:

Children admitted to a Pediatric Intensive Unit (PICU) require life-sustaining, complex therapies. Consequently, many critically ill children are sedated, restrained, and confined to prolonged periods of bedrest. Immobility is associated with short and long-term outcomes negatively impacting a patient's functional recovery and quality of life.

Critically ill children remain immobilized due to lack of awareness of negative consequences and lack of pediatric specific mobilization guidelines. Assessment and treatment by physical therapy, occupational therapy, and speech language pathologist are often delayed until the child has encountered a prolonged admission.

Survival rates among children of critical illness have significantly increased resulting in an increase in new morbidities, longer hospital stays, increased readmission rate, and children not at functional baseline by 6 months post PICU discharge.

Objectives:

- To describe early practice of physical therapy (PT), occupational therapy (OT), speech language pathology (SLP) consultation and patient engagement of early mobility activity prior to a standardized program.
- To evaluate change in consultation of PT/OT/SLP practice with a standardized early mobility program.
- To determine if PT/OT/SLP evaluation for rehabilitation need occurs earlier in the PICU length of stay post standardized early mobility program implementation.
- To measure the frequency in which critically ill children engage in early mobility activities by PICU admission day 3 with a standardized early mobility program.

Methods:

- Retrospective analysis of data within the electronic health record
- Data collected pre-early mobility January 1, 2016, through December 31, 2017, compared with post early mobility January 1, 2020, through December 31, 2021.
  - This timeframe was chosen to avoid the Hawthorne effect because it marks a time in which early mobility was not addressed frequently in this PICU and after implementation of early mobility program.
- Inclusion Criteria-
  - All patients admitted to the PICU
- Exclusion Criteria-
  - None
- Demographics
  - Age
  - Gender
- Variables
  - PT/OT/SLP consult orders placed during PICU admission
  - PT/OT/SLP consult orders placed by PICU hospital day 3
  - Patient engagement of early mobility activities by PICU hospital day 3
    - Early mobility activities are defined as: out of bed, standing, up to chair, ambulate, bed in chair position, dangle at edge of bed, floor play on mat, held, bedside commode

Categorical data are described as count (%) and compared using Chi-square test. Continuous data are presented as mean(SD) and compared between pre and post intervention time period using Student's t test. All statistical analyses were performed in SAS (version 9.4; SAS Institute Inc., Cary, NC, USA). A p value of < 0.05 was statistically significant.

Procedure:

- The early mobility program was inspired by the PICU UP! Early mobility program implemented at Johns Hopkins Children's Center.
- Specific early mobility activities are determined by severity of illness. As status improves, mobility activities are advanced.
- Every patient admitted to this PICU receives an order for PT, OT, and SLP consultation when the PICU admission order set is utilized. The order becomes active on PICU hospital day one.
- The PT, OT, and SLP screen patients for functional rehabilitation needs within 24 hours of order placement. Patients without acute rehab needs are identified using the screening protocol to ensure resource efficiency. However, all patients remain on the PT, OT, and SLP consultation list should the patient's rehab needs change during their length of stay.
- All PICU staff received didactic and hands on education for early mobilization in July 2019.
- The standardized early mobilization program began in August 2019.

Results:

Table 1- Sample Size Pre & Post Early Mobilty Program

	N	Percentage
Pre	3574	54.4
Post	2998	45.6

Table 2- Demographics By Gender

	Pre	Post	P
	3574	2998	
Gender, n (%)			0.413
Female	1661 (46.5)	1363 (45.5)	
Male	1913 (53.5)	1635 (54.5)	
Age (m)			<0.0001
Mean (SD)	85.5 (83.4)	91.8 (83.0)	
Median (Min-Max)	52 (0-498)	66 (0-533)	

Chi-square test for categorical data; T Test for continuous data.
Gender proportion were not statistically significant between pre and post program implementation.
Patients were slightly older (P<.0001) during the implementation of the program compared to pre-program implementation

Table 3- PT/OT/SLP Consult Orders Placed By PICU Admission Day 3 Pre & Post Early Mobilty Program

	Pre	Post	P
Rehabilitation Orders, n (%)			<.0001
	643 (18.0)	2492 (83.1)	

Chi-square test for categorical data

Table 4- Documented Patient Activity Within The 1st 3 Days Of PICU Admsission Pre & Post Early Mobilty Program

	Pre	Post	P
Patient Activity, n (%)			<0.0001
No Activity	3482 (100)	2454 (84.3)	
Activity	0 (0)	457 (15.7)	

Chi-square test

Table 5- Day Of PICU Admission PT/OT/SLP Consultations Were Placed

	Pre	Post	Total
Time To PT (Days), n (%)			
0	51 (13.8)	1541 (89.8)	1592
1	108 (27.91)	87 (5.07)	195
2	64 (16.54)	25 (1.46)	89
3	40 (10.34)	19 (1.11)	59
4	35 (9.04)	11 (0.64)	46
5	18 (4.65)	5 (0.29)	23
6	13 (3.36)	6 (0.35)	19
7	12 (3.1)	4 (0.23)	16
8	12 (3.1)	3 (0.17)	15
9	7 (1.81)	0 (0)	7
10	8 (2.07)	1 (0.06)	9

- There is a 76.6% increase in consultation to PT/OT/SLP by PICU admission day 3 post implementation of early mobility program.

Discussion:

- The emergence of the COVID-19 pandemic in early 2020 resulted in unanticipated deviations from the early mobility program.
- PT/OT/SLP consultations occurred more frequently and earlier in the PICU admission in the post implementation period allowing for earlier identification of critically ill pediatric patients rehabilitation needs and treatment.
- While there is a notable increase in patient mobilization, the percentage change is an inadequate representation of mobilization of critically ill pediatric patients in this PICU due to the difficulty of capturing mobility activities retrospectively from thousands of granular data points and the various nursing documentation practices.
- The increase of PT/OT/SLP orders and mobilizations of critically ill pediatric patients demonstrates the value of formalizing practice through validated education and program.

Conclusion:

Including a standardized early mobility program in PICU admission order set with screening protocols can increase the percentage of consultations for PT, OT, and SLP evaluations of critically-ill pediatric patients resulting in earlier identification of rehabilitation needs. Providing staff education and hands on training to compliment a standardization of early mobility programs can increase the percentage of critically-ill pediatric patients safely engaging in early mobility activities. There were no adverse events or unplanned device removal during early mobility activities.

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Change in Repeated 6-Minute Walk Distance Tests Near Time of Hospital Discharge for Acute Respiratory Failure Patients

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Background

- 6-minute walk test (6MWT) assesses functional exercise capacity
- Commonly used in evaluating acute respiratory failure (ARF) survivors after hospital discharge
- Little known about 6MWT in ARF prior to hospital discharge, including its variability at this point in patient recovery

Objectives

- To evaluate change in 6MWT distance in ARF survivors who had test performed on 2 separate occasions close to discharge

Methods

- Data from participants with two 6MWT at Johns Hopkins site of ongoing ICU rehab trial (*NEXIS* trial; NCT03021902), with IRB approval & consent
- Eligibility criteria included:
  - Critically ill adult >18 years old
  - Expected to require respiratory support for ≥48 hr (mech vent, high flow oxygen, or non-invasive vent)
  - Expected ICU stay >4 day after randomization
- 25 meters = minimum clinically important difference (MCID) in 6MWT for ARF survivors (*CHEST* 2015;147:1316-1326)
- 6MWT performed as per ATS/ERS, except only 1 test per assessment

Results

4 (11%) of 33 ARF survivors unable to perform test

12 of 33 patients (36%) completed two 6MWT

Patient Characteristic N=12	
Age, mean ± SD	57 ± 10
Male, n (%)	8 (66%)
White, n (%)	11 (91%)
Days between two tests, Median (IQR)	5 (3 , 7)

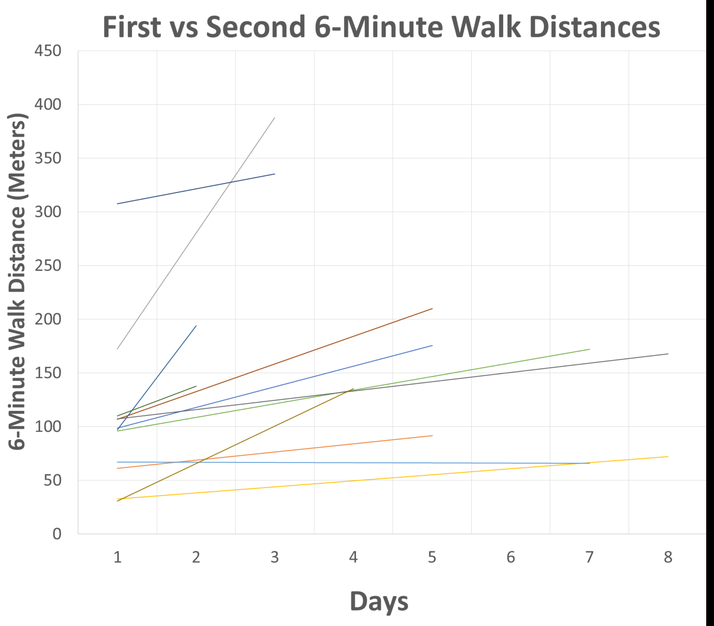
Results – First & Second 6MWT	
First 6MWD in meters, Median (IQR)	107 (66, 109)
Percent predicted, Median (IQR)	18% (14%, 19%)
Second 6MWD in meters, Median (IQR)	179 (124, 202)
Percent predicted, Median (IQR)	30% (20%, 36%)

Increase in 6MWT Distance

No. patients with ↑ in 6MWT >25 meters: 11 (92%)

Increase in 6MWT (second vs. first), median (IQR):

- 71 (30, 100) meters
- 12% (5%, 17%) percent predicted
- 90% (44%, 110%) change as % of first 6MWT



Conclusion

- Physical recovery for ARF survivors is dynamic near the time of hospital discharge
- Relatively large increase in 6MWT with repeated test near hospital discharge
- Despite improvement (>25 meter MCID), 6MWT is substantially lower than population norms, with a small minority of patients unable to perform 6MWT at hospital discharge
- Multi-center studies with larger sample size needed for greater precision and generalizability of these preliminary results

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Case Study as Demonstration of Methodology for Patients With Severe ICU-AW and Cognitive Impairment for Successful Extubation and Functional Progression

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Abstract

The purpose of this case study is to demonstrate the implementation of graded closed chain partial weight-bearing exercise and gravity-assisted long-sitting as key therapeutic interventions to generate foundational core and extremity strength in the patient population with ICU acquired weakness (ICU-AW), delirium, and prolonged mechanical ventilation toward successful extubation and progression of functional mobility.

Introduction

✿Pt is 55 y/o WF presented to ER 9/19/20 c/o acute abdominal pain.
✿PMHX: L/S DDD, chronic pain w/ opioid dependence, nicotine dependence, fibromyalgia, adrenal insufficiency, Vit B12 and D deficiencies, obstructive sleep apnea,prior pna, hx Cdiff colitis.

Complex medical course is outlined below:
9/27 Progressive hypoxia and respiratory failure requiring intubation. Perforated colon, rectum, and abdominal abscess; urgent total colectomy w/ end ileostomy.
10/18 extubation, but failed due to hypercapnea despite use of NIV, re-itnubated and +recurrence of sepsis
10/20 thoracentesis complicated by expanding pneumothorax requiring placement of chest tube
10/26: PT consult, initation of treatment; freq 5-7xw/wk w/ sessions to tolerance. Bed□chairlike position, dep bed□>chair hoyer x up to 2hrs.
10/29 Pt/husband consent to proceed w/ tracheostomy d/t severity of continued weakness and completion of vent weaning to trach mask by 10/30.
10/31 Pt transitioned to step down unit ; continued to work w/ PT; awaiting LTAC acceptance (MD on stepdown unit continuing to treat hyponatremia and so deemed unstable to transfer to LTAC yet).
11/7 Acute decompensation w/ hypoxic and hypercapneic resp failure and metabolic acidosis, back to ICU on vent support with trach. Return of sepsis with hypotension/shock and returned to vasopressor support w/ norepinephrine.
11/8-9 weaned from vent and pressor; able to SPT w/ PT modA bed to chair
11/12 back on pressor support intermittently x 3 days and H&H drop

Methods and Materials

A case report format featuring Patient J was utilized since she was able to self-consent to this case study [including photos] once alert within her ICU stay.

1.Intro, pt lethargic, opens eyes briefly to name only, even with raising HOB.
2.P/AAROM extremities supine w/ neuro-facilitation of 1 step commands, tapping.
3.Footplate moved in to DF neutral, HillRom bed moved into reverse trendelenburg for PWB through BLE. Repeat of facilitated UE ROM, patellar tapping and cued pressing of Bknees into extension that facilitates rote BLE exs. Max assist of trunk to longest in same bed position (occasionally rote BLE ext noted). Attempts to slowly decrease trunk support noting any rote trunk activity. Sp02, HR, RR monitored for signs of fatigue as well as pt attempt to lay back supine. Repeat trials x 3 with trunk sit time tolerated increasing each bout. Charlike position to rest/"sit" x goal 1-2hrs, BUE support but no head pillow to promote awake, indep head support.
4.Although pt remains lethargic, responsive to name only, more active engagement for AAROM UsE in reverse trendelenburg and pt responds to footplate PWB with cued B LE extension. Longest min/modA and able to hold trunk min/cga. Awakens/eyes open during sitt trials. Able to tolerate up 3-5mins of trunk sitting on each 3/3 bouts. Charlike position to rest/"sit" goal 2+ hrs, BUE support, no head pillow. Monitored for s,sx of fatigue.
5.Pt following simple cues partial time; pt eyes are open >75% session. Longsit for trunk warmup in reverse trendeleburg ->short sit EOB min/mod A. Able to progress to close sup of trunk; loses trunk balance w/ attempted AROM LEs.
6.Progress to sit EOB 15mins w/ seated AAROM LEs, close supv/tactile cues of trunk. Max A SPT OOB to chair. Left upright w/ BUE support w/ family member present.
7.After progress to sit close sup, and B knee ext 3/5, progress to sit-stand practice from raised->lowered bed heights. Progress stalls as pt becomes more medically compromised again and declines to death.

Results

The methodology demonstrates a progression that facilitates a functional progression and alertness with graded activity without triggering any startle responses, or undo fatigue in comparison to supine to dependent sitting EOB. Moreover, this technique is repeatedly achieiveable with 1 therapist even in cases of limited resources, therefore progressing patients safely and effectively.

Figure 1 - pt in supine leg press position; increased w/ reverse Trendelenburg for PWB.

Fig 2 - Longest to short sit EOB

Conclusions

Use of this technique facilitates alertness, trunk control, and overall functional mobility at earlier and faster rates within and between sessions than ROM and maximal x 2/dependent assisted mobility in this complicated population alone.

Of note, within a broader conversation of health equity, the methodology can be key in maximizing earlier functional recovery rates and minimizing associated deficits in patients with ICU-AW even in cases of limited personnel or capital equipment resources.

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