

# Adapting an ICU Multidisciplinary Early Mobility Program for Nursing Implementation



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## Introduction

Implementing early mobility programs in the Intensive Care Unit (ICU) decreases ICU length of stay by up to 20% and prevents loss of functional mobility.<sup>2</sup> Multidisciplinary early mobility teams consisting of physical therapy, occupational therapy, respiratory therapy, and registered nurses are optimal for mobilizing high acuity patient populations, but funding hinders widespread adoption of critical care multidisciplinary mobility teams.<sup>7</sup>

## Background

- Global challenge to establish multidisciplinary early mobility teams as only 40% of ICUs worldwide have dedicated mobility resources<sup>3</sup>
- Nearly 50% of ICU patients remain sedentary with 65% reporting generalized weakness without early mobility initiatives<sup>1, 6</sup>
- Medical ICU (MICU) at a community hospital has a unit-dedicated multidisciplinary early mobility team, but mobility resources are limited to the MICU
- Cardiac ICU (CICU) at the same institution has no formal mobility team, leading to fragmented and inconsistent mobility efforts
- Mobility in CICU is reliant on nursing discretion and motivation, with a lack of clear expectations or structured mobility approach
- Nursing can fill a crucial role in patient mobilization efforts in the absence of a formal multidisciplinary mobility team to improve patient outcomes<sup>5</sup>

## Purpose

This quality improvement project sought to implement the Johns Hopkins Highest Level of Mobility (JH-HLM) Activity Tool and the Can My Patient Participate in Rehab (CMPPR) tool adapted from a multidisciplinary early mobility program for nursing implementation in the CICU to increase Highest Level of Mobility (HLM) scores and decrease ICU length of stay (LOS).<sup>4</sup>

## Aims

- Aim 1:** By September 2021, > 80% of the CICU nursing staff will attend one early mobility education session with the CICU project coordinator.
- Aim 2:** The collective HLM scores for CICU patients will increase by December 2021.
- Aim 3:** The collective ICU LOS for CICU patients will decrease by December 2021.

## Methods

- Design:** pre-post intervention
- Setting:** 12-bed non-surgical Cardiac Intensive Care Unit at an urban mid-Atlantic community medical center
- Sample:** 298 participants admitted to CICU over a 20-week period
  - Pre-intervention group ( $n = 132$ ) admitted 7/11/21 to 9/18/21
  - Intervention group ( $n = 166$ ) admitted 9/19/21 to 11/27/21

## Intervention Group Demographics

Age, mean (SD)	63.17 (15.719)	Admitting Diagnosis	N = 166, (%)
Sex, n(%)		Pulmonary	37 (22.3%)
Male	99 (59.6%)	Cardiac	77 (46.4%)
Female	67 (40.4%)	Gastrointestinal	5 (3%)
		Endocrine	11 (6.6%)
		Renal	6 (3.6%)
		Other	30 (18.1%)

SD = standard deviation

## Intervention

- Staff Education:** CICU nurses received education on tool application and documentation. Pre-post intervention Qualtrics surveys were distributed to assess nursing opinions regarding patient mobility.
- Application of CMPPR and JH-HLM Tools:**
  - Nurses screened patients daily for early mobility eligibility with the CMPPR to identify patients at risk for adverse events during mobilization.
  - Applicable exclusion criteria were documented. If no exclusions, patients were mobilized based on their JH-HLM mobility level.
  - Twice-daily mobility goal for eligible patients.
  - Data recorded on individual patient mobility logs.

Activity and Mobility Program		TODAY'S DATE: _____	
HIGHEST LEVEL OF MOBILITY (HLM)	GOAL: To Maximize Mobility Every Day	✓ YESTERDAY'S HLM SCORE	✓ TODAY'S GOAL
8	WALKED 250 FEET OR MORE (1+ LAPS ON UNIT)		2+ TIMES
7	WALKED 25 FEET OR MORE (WALKED OUTSIDE ROOM)		2+ TIMES
6	WALKED 10 STEPS OR MORE (WALKED TO RESTROOM)		2+ TIMES
5	STATIC STANDING (1 OR MORE MINUTES)		2+ TIMES
4	TRANSFERRED TO CHAIR/COMMUNE		2+ TIMES
3	SAT AT EDGE OF BED		2+ TIMES
2	TURNED SELF IN BED/ BED ACTIVITIES		2+ TIMES
1	LYING IN BED		2+ TIMES

In every patients room as a form of communication among everyone on patients progress!

## Results

- Aim 1:**
  - 100% of CICU staff nurses received mobility education by the end of September 2021.
  - Unable to draw conclusions on change in nursing opinions towards early mobility given poor response rate (14.29% pre-intervention, 2.86% post-intervention).

CMPPR Exclusion Criteria Met	Occurrences Documented N = 166, (%)
#1	27 (16.3%)
#2	1 (0.6%)
#3	27 (16.3%)
#4	9 (5.4%)
#5	5 (3%)
#6	47 (28.3%)
#7	17 (10.2%)
#8	5 (3%)
#9	5 (3%)
#10	3 (1.8%)
#11	3 (1.8%)
#12	55 (33.1%)

- Aim 2:**
  - No significant change in HLM scores between groups ( $U = 6685.5, p = 0.685$ ).

Daily Mobility Goal Completion	N = 166, (%)
Mobility Goal Met	52 (31.3%)
Mobility Goal Not Met	65 (39.2%)
Missing Data	49 (29.5%)

- Aim 3:**
  - Significant increase in ICU LOS from 4.44 days to 4.79 days for the early mobility intervention group ( $U = 9198.5, p = 0.016$ ), but further study is needed to assess influencing factors (lack of floor beds, disparities in acuity between participant groups, etc.).

## Conclusions

- Nurse-driven early mobility initiatives did not improve patients' mobility outcomes or decrease overall ICU LOS in this critical care setting.
- As the CMPPR was adapted to exclude therapies that would typically be mobilized in multidisciplinary programs (mechanical ventilation, low-dose vasopressor requirement, etc.) to ensure patient safety with nursing support alone, this emphasizes a need for further resources and multidisciplinary early mobility teams to mobilize high acuity patients.
- Despite the suboptimal findings, nursing participation in early mobility initiatives remains paramount to improving critical care outcomes.
- Further exploration is necessary to improve nurse-driven early mobility programs in the absence of dedicated mobility teams.

- Limitations:**
  - Unable to compare patient acuity between groups as pre-intervention demographic data was not collected. As patient acuity may result in longer ICU LOS and lower HLM scores, this should be considered for future studies.

## CAN MY PATIENT PARTICIPATE IN REHAB?

CRITERIA FOR EARLY MOBILITY	
Eligible for early mobility unless one of the following conditions exists:	
Neuro	1 RASS -4/-5 2 RASS +3/+4
Cardio	2 New DVT w/ anticoagulation < 24 hours Femoral sheath 3 MAP < 55 mmHg or Vasopressors increased in past 2 hours or Norepinephrine > 0.15 mcg/kg/min Epinephrine > 0.15 mcg/kg/min Dopamine > 15 mcg/kg/min Phenylephrine > 1 mcg/kg/min Vasopressin > 0.02 u/min
Respiratory	4 MAP > 140 mmHg or Nitroglycerin, Nitroprusside, Nicardipine, Diltiazem, Esmolol, or Labetalol via continuous infusion (any dose) 5 Pulse ox < 88% Tachypnea > 45 breaths/min Acidosis pH < 7.25 6 Mechanical ventilation 7 Non-invasive mechanical ventilation (BIPAP, CPAP, High-flow nasal cannula)
Invasive Therapy	8 Transvenous pacer (TVP) 9 Swan-Ganz catheter 10 Continuous veno-venous hemodialysis (CVVHD) 11 Intra-aortic balloon pump (IABP)
Other	12 RN's clinical judgement – document reason in barriers to mobility

## References

