



# Is There a Relationship between the Timing of Early Mobilization of Patients Administered by Physical Therapy in the Intensive Care Unit at Lee Health: HealthPark Medical Center and Their Length of Stay

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## Introduction

- Early mobilization is the practice of starting physical therapy as soon as the patient is deemed medically stable.
- Physical therapist led early mobilization interventions include range of motion exercises, therapeutic exercise, bed mobility, transfer and gait training as applicable, with the goal of decreased time of a patient being bedbound.
- There are numerous benefits to early mobilization including a reduction in deconditioning, decreased amount of rehabilitation needed after discharge from hospital, and improved patients' muscle strength and functional mobility.
- Additional benefits of early mobilization include improved self-perceived functional status, and decreased mortality rate.

## Objectives

- The objective of this study was to explore if there was a relationship between early mobilization, administered by physical therapists, and the length of stay for patients in the intensive care unit.
- Publish the data to emphasize the importance early mobilization has on patients' length of stay in the intensive care unit.
- Make the data accessible to university programs, hospitals, and healthcare providers to ensure they are able to incorporate and educate on the importance of early mobilization during the patients' stay in the ICU

## Methods

- Descriptive retrospective study examining if there was a relationship between LOS in the ICU and hospital for patients in the ICU and physical therapist led early mobilization at Lee Health: HealthPark Medical Center.
- Data was collected retrospectively through review of medical records from the four ICUs (medical, surgical, thoracic, and open-heart).
- Data consisted of date and time of patient admission to the ICU, first physical therapy evaluation, discharge from the ICU and hospital, and type of ICU admitted to for a total of 137 patients.
- The date of patient admittance to the ICU was subtracted from the date of the first physical therapy evaluation to determine the number of hours before physical therapy was initiated. The date of initial physical therapy evaluation was subtracted from the date of discharge from the ICU to determine the # of days the patient spent in the ICU.

## Results

### Descriptive Statistics of all Patients Receiving PT in ICU

- Of the 137 patients used in the study, 46 patients received PT during the ICU stay
- Mean LOS in all 4 ICUs was 114.0 hours, N= 46; Mean LOS in hospital for all 4 ICUs was 181.0 hours, N=137

### Total Number of Patients Who Received PT During Their ICU Stay (4 ICUs)

ICU	N	Mean LOS in ICU (hrs.)	Std. Deviation of LOS in the ICU (hrs.)	Coefficient of Variation (%)	Mean time to 1 <sup>st</sup> PT intervention (hrs.)	Std. Deviation of time to 1 <sup>st</sup> PT intervention (hrs.)	Coefficient of Variation (%)
All ICUs combined	46	114.0	98.5	86.4	68.3	59.7	87.4

- Mean LOS in each of the ICUs ranged from 90-144.5 hours (excluding TICU, which patients did not receive PT in ICU)
- Mean time to 1<sup>st</sup> PT evaluation ranged from 52.3-73.0 hours (excluding TICU, which patients did not receive PT in ICU due to patients receiving PT)

### Individual ICUs Separated by Number of Patients who Received PT in During their ICU Stay

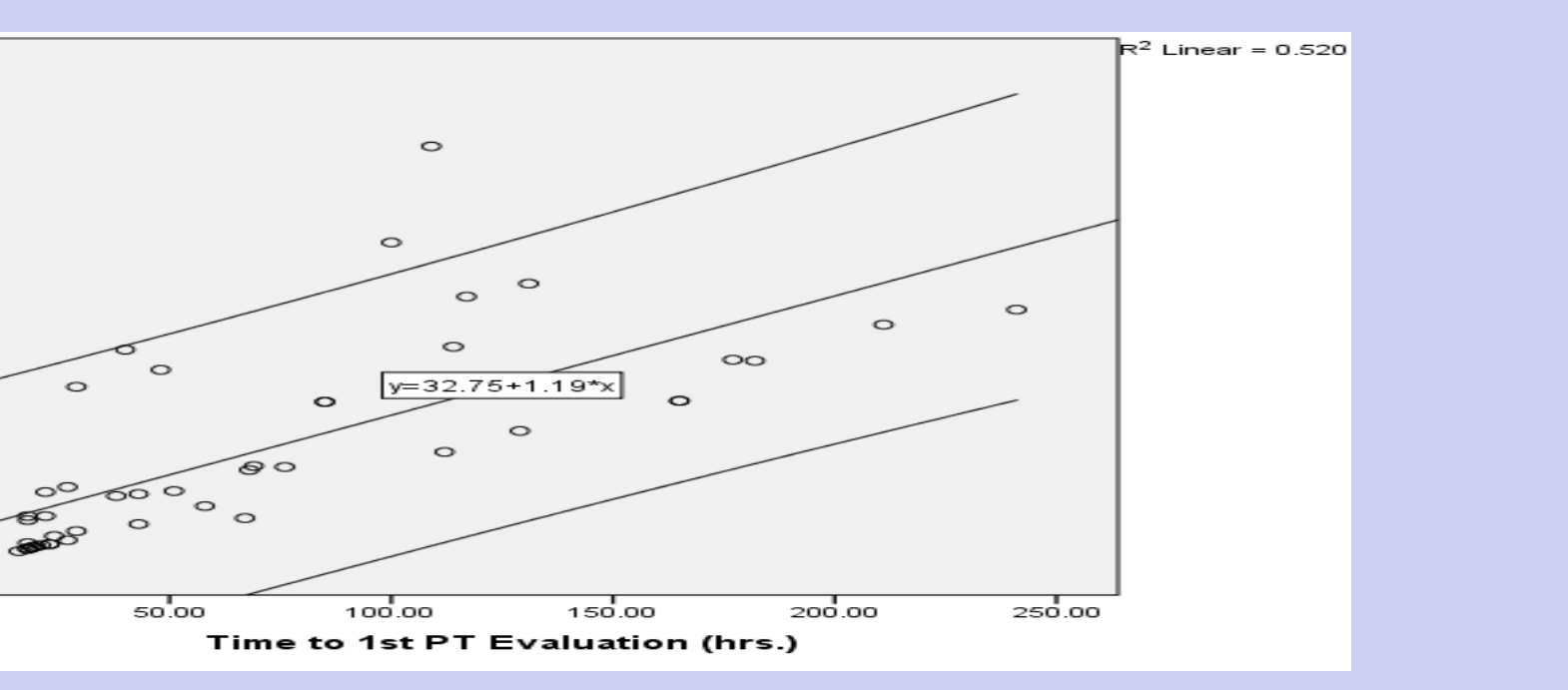
ICU	N	Mean LOS in ICU (hrs.)	Std. Deviation of LOS in the ICU (hrs.)	Coefficient of Variation (%)	Mean time to 1 <sup>st</sup> PT intervention (hrs.)	Std. Deviation of 1 <sup>st</sup> PT intervention (hrs.)	Coefficient of Variation (%)
Open Heart	17	90.0	119.3	133	51.5	52.3	102
MICU	13	109.0	86.0	79.0	76.0	73.0	96
SICU	16	144.5	80.6	56	81.0	53.8	66
TICU							

### Statistical Significance of Time to 1<sup>st</sup> PT Eval Incorporating all Patients Compared to LOS in ICU/Hospital

Dependent value	Independent value	ANOVA sig.	Adjusted R square	Slope Equation
LOS in the Hospital	Time to 1 <sup>st</sup> PT intervention	.000	.261	Y=1.06E2+1.04*X
LOS in the ICU	Time to 1 <sup>st</sup> PT intervention	.000	.509	Y=32.75+1.19*X

- Analysis of variance determining significance of effect of time to 1<sup>st</sup> PT Eval for LOS in hospital and ICU
  - Open-Heart: Significant for LOS in the hospital, F (1,33)=20.01, p<.001 and LOS in the ICU, F(1,15)=21.02, p<.001
  - TICU: Not significant for LOS in hospital. No PT in ICU, received PT when transferred to PCU
  - MICU: Significant for LOS in hospital, F (1,33)=8.40, p=.007 and LOS in the ICU, F(1,11)=45.84, p<.001
  - SICU: Statistically significant for LOS in the hospital, F(1,30)=20.89, p<.001 and not significantly significant for LOS in the ICU, F(1,14)=5.83, p=.30
- Number of patients who underwent surgery during ICU stay: Open-heart (17), TICU (0), MICU (4), SICU (6)

### Time to 1<sup>st</sup> PT Eval Compared to ICU LOS for all Patients



## Data Analysis

- SPSS software was used to analyze the data, which contained information specific to each ICU and a document containing the total data.
- Two simple linear regressions were run for each data set to analyze the association between time to first PT evaluation and the 2 dependent variables (LOS in hospital and ICU).
- Outcomes of the regression were presented as an ANOVA, a model summary, and scatterplot graph. Alpha value for significance for the simple linear regression was set at .05.

## Discussion

- Time to 1st PT Eval had a significant effect on LOS in both the ICU and hospital. The adjusted R<sup>2</sup> value for ICU LOS and time to 1<sup>st</sup> PT evaluation was .509, indicating a moderate relationship. Considering the complexity seen with patients who are admitted to the ICU, a moderate relationship between ICU/hospital LOS and independent variable is noteworthy for the importance of early mobilization.
- MICU was found to have the strongest correlation comparing LOS in the MICU to time to 1<sup>st</sup> PT Eval. Adjusted R<sup>2</sup> was .789 with the R<sup>2</sup> at .806. Potential reason for strong correlation was the MICU was found to have the least amount of surgical procedures take place compared to the other ICUs.
- Open-Heart was found to have a moderate correlation comparing LOS in ICU with time to 1<sup>st</sup> PT Eval. Adjusted R<sup>2</sup> was .556 with R<sup>2</sup> at .584. All patients in the open-heart ICU underwent surgery (17 total). Majority of patients in the open-heart ICU received PT within hours of ICU discharge so it was difficult to determine the effects of early mobilization on their ICU stay.
- A weak correlation was found in the SICU comparing 1<sup>st</sup> PT Eval and LOS in the ICU with an adjusted R<sup>2</sup> of .244 and R<sup>2</sup> at .294.
- No patients received PT during their stay in the TICU so a correlation could not be determined from the data collected.

## Conclusions

- Time to first physical therapy evaluation had a statistically significant effect on LOS in the ICU and hospital.
- Patients who received physical therapy early in their ICU stay, generally had a shorter LOS in the ICU and discharged from the hospital at a quicker rate.
- The results found in the study support research conducted by Morris, Goad, & Thompson, 2008, that early mobilization decreases LOS in the ICU and hospital.
- Further research is needed to better understand the multitude of variables and their effects of LOS in the ICU and hospital.

## References: See Handout with Reference List