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Examining Mobility Within a Physical Therapy-Driven Proning Protocol During the COVID-19 Pandemic

Sidney M. Stoddard PT, DPT Lehigh Valley Health Network, sidney.stoddard@lvhn.org

Daniel Sawyer PT, DPT Lehigh Valley Health Network, Daniel.Sawyer@lvhn.net

Michael Pechulis DPT Lehigh Valley Health Network, michael.pechulis@lvhn.org

Julie M. Skrzat PT DPT PhD CCS Lehigh Valley Health Network, Julie.Skrzat@lvhn.org

Mark Fuse Lehigh Valley Health Network, mark.fuse@lvhn.org

See next page for additional authors

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Authors

Sidney M. Stoddard PT, DPT; Daniel Sawyer PT, DPT; Michael Pechulis DPT; Julie M. Skrzat PT DPT PhD CCS; Mark Fuse; Amanda Fox; Elizabeth A. Wetzler; Mary Loose PT; Ryan Vetter MS-OTR/L; Kaitlyn Musco MD; Christopher Lenivy DO; and Shae Duka BS

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Examining Mobility Within a Physical Therapy-Driven Proning Protocol During the COVID-19 Pandemic

Sidney M Stoddard, PT, DPT, Daniel Sawyer, PT, DPT, Michael Pechulis, PT, DPT, Julie Skrzat, PT, DPT, PhD, CCS, Mark Fuse, PT, DPT, Amanda Fox, PT, DPT, Elizabeth Wetzler, PT, Mary Loose, PT, Ryan Vetter, MS, OTR/L, Kaitlyn Musco, MD, Christopher Lenivy, DO, Shae Duka, MPH Lehigh Valley Health Network, Allentown, Pa.

Background

- Due to the disease progression of COVID-19, a hospital management challenge has been availability of intensive care unit (ICU) beds and respiratory ventilators.⁸
- To help combat this challenge, prone positioning has been implementd for patients with COVID-19.1,2,6,7,10
- Prone positioning in patients with acute respiratory distress syndrome has been shown to improve oxygenation and decrease mortality.^{3,4,5}
- During the 1st wave of the COVID-19 pandemic, there was limited evidence examining the effectiveness of the prone positioning intervention being led by a physical therapy (PT) team.
- Thus, Lehigh Valley Health Network (LVHN) nursing and rehabilitation departments collaborated to assemble an interprofessional prone positioning team.⁹

Aim and Hypothesis

- Aim: To examine the impact of mobility on a PT-driven prone positioning intervention with patients who have COVID-19
- Hypothesis: There would be no association between groups, as defined by prone positioning status, and body mass index (BMI), prior level of function (PLOF), or current functional status (as represented by AMPAC scores)

Methods

- Design: Retrospective chart review
- Inclusion criteria: >18 years old, PT consult, admitted to the medical-surgical ward at LVHN between 3/1/2020 – 6/30/2020, (+) COVID-19 test via nasal swab, receiving supplemental oxygen, definitive discharge location
- Exclusion criteria: Children, pregnant women, prisoners • Protocol:
- Of those included, patients were stratified into one of three groups
- Independent
- Assistance
- The patients' outcomes were tracked throughout hospitalization. Statistical analysis: Descriptive statistics, Kruskal Wallis, Chi Square, Fisher's Exact

INDEPENDENT

- Patient able to achieve and maintain prone position without assistance
- Plan of Care: Patient Education, Therapeutic Exercise, Progressive Mobility Training if needed

ASSISTANCE

- Patient able to achieve and maintain prone position with assistance
- Plan of Care: Remediation of Mobility Deficits, Patient Education, Therapeutic Exercise, Rom Exercise Program, Progressive Mobility Training

Initial data collection, n=205

64 patients did not have a positive COVID nasal swab, n=141

18 patients did not have a PT evaluation n=123

5 patients were intubated prior to the study period, n=118

8 patients were on the unit, n=110

Special Considerations

SPECIAL CONSIDERATIONS

 Patient unable to achieve and/or maintain prone position despite assistance. Patient may have achieved alternative positioning in 1/4 side lying, side lying, or 3/4 prone.

 Plan of Care: Remediation of Mobility Deficits, Patient Education, Therapeutic Exercise, Rom Exercise Program, Progressive Mobility Training

Results

	PRON	IE POSITIONIN	NG GROUP				
Characteristics	Total Sample (n=110)	Independent (n=50)	Assistance (n=21)	Special Considerations (n=39)	p-value		
	DEMOGRA	PHIC DESCRIP	TIVE STATIST	TICS			
Age, years median	66.0	49.0	72.0	79.0	<0.000		
(IQR)	(49.0-82.0)	(41.0-66.0)	(61.0-83.0)	(67.0-86.0)			
Sex n(%) Male	58 (52.7)	29 (58.0)	13 (61.9)	16 (41.0)	0.1818 ^b		
TIC		nnicity n(%)	13 (01.9)	10 (41.0)	0.0070 ^c		
American Indian or Alaskan Native	0	0	Ο	Ο			
Asian	5 (4.6)	3 (6.0)	1 (4.8)	1 (2.6)			
Black or African American	6 (5.5)	4 (8.0)	1 (4.8)	1 (2.6)			
Hispanic or Latino	44 (40.0)	26 (52.0)	9 (42.9)	9 (23.1)			
Native Hawaiian or Other Pacific Islander	Ο	Ο	Ο	Ο			
White	51 (46.4)	14 (28.0)	9 (42.9)	28 (71.8)			
Other	4 (3.6)	3 (6.0)	1 (4.8)	0			
BMI, kg/m2	29.7 (25.0.22.6)	31.2 (26 4 25 5)	25.3	29.5	0.0398		
median (IQR)	R) (25.0-33.6) (26.4-35.5) (21.9-32.0) (25.0-33.4) Prior Level of Function n(%)			<0.000			
Independent in Community	70 (63.6)	49 (98.0)	12 (57.1)	9 (23.1)			
	HOSPITA	AL DESCRIPTIV	E STATISTIC	S			
Hospital LOS, days median (IQR)	8.0 (4.0-14.0)	6.5 (3.0-11.0)	10.0 (5.0-15.0)	8.0 (5.0-16.0)	0.2113°		
ICU Transfer n(%) Yes	28 (25.5)	10 (20.0)	11 (52.4)	7 (18.0)	0.0069		
ICU LOS, days median (IQR)	4.0 (2.0-8.5)	6.0 (3.0-20.0)	3.0 (2.0-7.0)	3.0 (3.0-5.0)	0.2847		
Ward LOS, days median (IQR)	6.0 (4.0-11.0)	6.0 (3.0-10.0)	6.0 (3.0-12.0)	7.5 (5.0-14.0)	_		
PRONE PO	SITIONING	INTERVENTIO	N DESCRIPT	IVE STATISTICS			
Number of Prone Positioning Sessions median (IQR)	2.0 (2.0-3.0)	2.0 (2.0-3.0)	3.0 (2.0-6.0)	2.0 (1.0-4.0)	0.0261		
Patient Achieved Prone Position n(%) Yes	71 (64.5)	47 (94.0)	17 (81.0)	7 (18.0)	<0.000		
O₂ Required at Discharge n(%) NOTE: n=103 Yes	26 (25.2)	7 (14.3)	6 (33.3)	13 (36.1)			
	Discharge	e Destination n	(%)		<0.000		
Home	41 (37.3)	34 (68.0)	3 (14.3)	4 (10.3)			
Home w/assist	24 (21.8)	10 (20.0)	7 (33.3)	7 (18.0)			
Assisted living	6 (5.5)	0	2 (9.5)	4 (10.3)			
Inpatient rehab	5 (4.6)	1 (2.0)	2 (9.5)	2 (5.1)			
Skilled nursing facility	15 (13.6)	2 (4.0)	3 (14.3)	10 (25.6)			
Death	11 (10.0)	3 (6.0)	4 (19.1)	4 (10.3)			
Other including	8 (7.3)	0	Ο	8 (20.5)			

PRONE POSITIONING GROUP										
Characteristics	Total Sample (n=110)	Independent (n=50)	Assistance (n=21)	Special Considerations (n=39)						
First AMPAC median (IQR)	12.0 (8.0-18.0)	21.0 (11.0-24.0)	11.0 (8.0-16.5)	10.0 (8.0-12.0)						
Final AMPAC median (IQR)	16.0 (8.0-21.5)	22.0 (8.0-24.0)	17.5 (8.0-18.5)	12.0 (8.0-15.0)						
Number of Proning Sessions median (IQR)	2.0 (2.0 – 3.0)	2.0 (2.0-3.0)	3.0 (2.0-6.0)	2.0 (1.0-4.0)						
Patient Achieved Prone Position n(%) Yes	71 (64.5)	47 (94.0)	17 (81.0)	7 (18.0)	<					
LEV	EL OF ASSIS	STANCE TO A	CHIEVE PROI	NE N(%)						
Independent	49 (44.6)	45 (90.0)	1 (4.8)	3 (7.7)						
Supervision Assist	15 (13.6)	4 (8.0)	3 (14.3)	9 (20.5)						
Minimal Assist	15 (13.6)	1 (2.0)	8 (38.1)	6 (15.4)						
Moderate Assist	13 (11.8)	Ο	3 (14.3)	10 (25.6)						
Max Assist	8 (7.3)	Ο	3 (14.3)	5 (12.8)						
Dependent	10 (9.1)	0	3 (14.3)	7 (18.0)						

Abbreviations: IQR=interquartile range. SD=standard deviation.

Notes: Categorical variables are presented as n(%), and continuous variables are presented as either the mean and standard deviation or median and interguartile range. Percentages are calculated based upon the column totals.

2 (4.0)

^a Kruskal Wallis test

^c Fisher's Exact test ^b Chi Square test

2 (9.5)

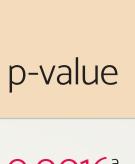
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Other

ASO Post-Proning

n(%)

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- 0.0033ª

<0.0001



0.1804

Discussion

- Significant differences were found for age, BMI, and PLOF between groups, as defined by prone positioning status.
- Patients who were younger and more functional at baseline tended to be in the independent group.
- There were significant differences in AMPAC scores between prone positioning groups.
- AMPAC scores reflected a patient's ability to tolerate and/or complete functional mobility tasks. - Patients with lower initial AMPAC screening scores were often in the assistance and special considerations groups.
- Patients higher initial AMPAC screening scores tended to be in the independent group.
- Our analyses show that patients classified into the Independent Prone Positioning group had better hospital outcomes, including more hospital discharges to home and less mortality.
- Limitations:
- Patients' time spent in prone was not captured. Recent evidence indicates that greater than 8 hours in prone reduces risk of mechanical ventilation.¹⁰
- An unequal sample of convenience resulted in unequal group sizes.
- Data was collected from one institution via retrospective, manual chart review with multiple reviewers.

Clinical Relevance

- Age, BMI, and PLOF provide insights into amount of assistance likely needed to achieve prone position.
- The significant associations between first and final AMPAC scores and groups identify the potential importance of mobility metrics for triage in a PTdriven prone positioning intervention.
- Further investigation of the dose and impact of progressive mobility may be warranted for patients diagnosed with COVID-19 in the acute care setting. A larger sample size across multiple settings would strengthen future research.



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