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Post Evaluation of a Nurse Driven Early Mobility Program

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Final DNP Project Report

Post Evaluation of a Nurse Driven Early Mobility Program

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University of Kentucky

College of Nursing

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Dedication

I dedicate my DNP final project to my husband and son who have supported me throughout my academic endeavors. They have been by my side through the last fifteen years while I have worked toward a Bachelor's, Master's and now Doctoral degree. I would have never been able to accomplish what I have without their unconditional love and support. This is definitely their DNP also!

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Abstract

The goal of this study was to evaluate the effectiveness of a recently implemented nurse driven early mobility program on patients in two Trauma Surgical Intensive Care Units at the University of Kentucky HealthCare (UKHC). The purpose of this study was to evaluate the effectiveness of a recently implemented nurse driven early mobility program (NDEMP) on patients in two Trauma Surgical Intensive Care Units at the University of Kentucky HealthCare (UKHC). Nursing staff are responsible for mobilizing patients to their maximum ability twice daily in addition to any therapy provided by Physical and Occupational Therapists. The study was an uncontrolled before and after design using retrospective data analysis. UKHC employs a mobility score, a tool developed by a UKHC multidisciplinary team including nurses and physical therapists. The mobility score was chosen because the nurse can quickly assess the patient's mobility level in a quick, easy and reproducible manner. The mobility score in the ICU had a statistically significant increase in the pre-intervention mobility score of 5.7 to a post-intervention mobility score of 7.9. Hospital mobility score showed an increase of 7.5 pre-intervention to a 7.9 post-intervention score, which was also statistically significant. Ventilator mean days decreased from 2.2 pre-intervention to 1.9 post-intervention and pneumonia decreased from 7.3% pre-intervention to 5.7% post-intervention. This was not statistically significant but it did trend in the right direction. The VTE rate increased (pre = 3.0% vs. post = 4.8%) but was a non-statistically significant increase. Mean days in the ICU increased from pre-intervention of 5.7 mean days to 5.8 mean days post-intervention but was not statistically significant. A non-significant decrease in discharge to home (pre = 98.3% vs. post = 96.5%) was also found. There were no appreciable decreases in length of stay. Within a very short time frame, the TSSNDEMP showed a reduction in ventilator days and pneumonia as well as a

significant increase in ICU and hospital discharge mobility scores. No adverse events occurred during the study. The success of this program supports the ability of nursing to mobilize patients safely utilizing the existing multidisciplinary team rather than adding staff.

Keywords: early mobility, immobility, critical illness neuropathy

Post Evaluation of a Nurse Driven Early Mobility Program

Introduction/Project Overview

The purpose of this study was to evaluate the effectiveness of a recently implemented nurse driven early mobility program (NDEMP) on patients in two Trauma Surgical Intensive Care Units at the University of Kentucky HealthCare (UKHC). The study was an outcome evaluation using an uncontrolled before and after design with retrospective data analysis. Measures of effectiveness include patient clinical outcomes and patient throughput. The study, relevant background, literature and implications will be discussed.

Problem Statement and Review of Literature

Search Description

A comprehensive literature search utilizing PubMed, MEDLINE, CINAHL, Cochrane and EBSCOhost databases was performed. Search terms included early mobility, immobility, complications of immobility in intensive care, critical illness neuropathy and safety of early mobility. The timeframe for the search was January 2003 through May 2016. Inclusion criteria were human adult subjects (age greater than or equal to 18), animal studies, intensive care unit patients, acute care patients, articles published in or translated to English. Exclusion criteria were: pediatric subjects (under age 18), studies not translated to English, and studies published before 2003.

Evidence

The consistently common themes noted in the literature were that any immobility is detrimental, many patients suffer lifelong negative effects after periods of immobility during hospitalization and early mobility activities are beneficial and safe. Appendix A contains a

summary of all relevant research reviewed, as well as animal studies and non-research scientific articles.

Historically, critically ill patients have been cared for utilizing strict bed rest and deep sedation and analgesia. Animal studies have shown that immobilization alone creates significant polyneuropathy and joint contractures, effects are additive when combined with inflammatory processes (Fink et al, 2008; Wong, Trudel & Laneuville, 2015). Research and systematic reviews consistently demonstrated the negative effects of immobility on all body systems. Critically ill patients are especially susceptible to critical illness neuromuscular abnormalities (CINMA). CINMA patients had higher in hospital mortality rates as well as prolonged ventilator days and increased length of stay (LOS). Post hospitalization up to 45% of CINMA patients retain polyneuropathy and functional disability (Stevens et al., 2007). Clavet, Herbert, Fergusson, Doucette and Trudel (2008) noted that 36% of patients in a tertiary ICU had joint contracture in at least one joint post discharge, 34% of the contractures were severe enough to impair physical function and 50% of those patients still had contractures 7 weeks post discharge. A large percentage of older adults develop functional decline between hospital admission and discharge (Covinsky et al., 2003). This is particularly important as the mean age of our population of ICU patients is steadily increasing. The proportion of adults aged 65 years and older in Kentucky is projected to be over 25% by 2030 and greater than 56% of Kentucky residents aged 75 and older have some form of disability prior to a major hospital stay (Institute for Aging, 2015).

Sample size varies greatly in the literature, however evidence consistently indicates that patients receiving early mobility initiatives have decreased ICU and hospital LOS, decreased ventilator days, lower mortality and readmission rates (Morris et al., 2008, 2010; Clark,

Lowman, Griffin, Matthews & Reiff, 2009; Dong, Yu, Sun, Fang & Li, 2014; Engel, Needham, Morris & Gropper, 2013; Fraser, Spiva, Forman, & Hallen, 2015; Hopkins, Mitchell, Thomsen, Schafer & Brown, 2016; Klein, Mulkey, Bena & Albert, 2015). Although many patients and nurses perceive that early mobility activities could be detrimental and a risk to the patient, mobility activities in the ICU are safe. It is important to educate patients, staff and family members that vital sign changes such as increased heart rate, respiratory rate and blood pressure during exertion are normal and expected just as they are with the non-hospitalized population. Significant decreases in vital signs during activity are much more concerning (Stiller, 2007). No significant adverse events with any effect on patient outcome have been noted in the mobility literature to date (Sricharoenchai et al., 2014; Zomorodi, Topley & McAnaw, 2012; Winkelman & Peerboom, 2010; Parker & Needham, 2013; Ross & Morris, 2010; Lee, Suh, Yang, Park & Chung, 2015; Lima, DsSilva, Park & Pires-Neto, 2015).

Background and Significance

The trauma patient population is a cohort that can suffer significant disability post injury and hospitalization. Many survivors of trauma and other illnesses requiring intensive care unit stays never return to their baseline pre illness functional level. Significant portions of survivors of critical illness have physical and/or cognitive impairments that permanently prevent their return to work and other societal functions (Hopkins, Mitchell, Thomsen, Schafer, Link & Brown, 2016). Although these patients have traditionally been on bedrest, at UK HealthCare the Trauma Surgical Service (TSS) service line decided to implement a nurse driven early mobility program (NDEMP) in an attempt to improve patient outcomes and reduce post hospitalization disability in the trauma and surgical population. A NDEMP was selected because it did not require addition of staff or a request for funding new positions from the institution, although

much of the evidence regarding early mobility does cite the use of extra personnel specifically for mobility activities. A mobility program workgroup consisting of a clinical nurse specialist (CNS), physician champion, nursing service line director, assistant patient care manager, physical and respiratory therapy leadership, physical therapists, staff nurses and nurse care technicians was formed. The workgroup identified necessary stakeholders: administrative nursing and physician leadership for the service line, staff nurses and nurse care technicians, physical and respiratory therapist partners and physical medicine and rehabilitation physicians.

The mobility program workgroup partnered with Stryker to adapt their evidence based early ICU mobility program to an entire service line NDEMP, including all levels of care. One way to generate excitement among the staff was to have a contest for a slogan to name the mobility program. The winning slogan was "Walking the Road to Recovery". The Stryker educator and the TSS CNS rolled out education for the entire service line including nurses, nursing care technicians, pharmacists, physical and respiratory therapists and physicians including residents. In order to maintain excitement and reward staff for great work, the mobility program leadership group gave "secret shopper" prizes to staff that went beyond the daily expectation mobilizing their patients. The winners and their photos were featured in the service line's end of week notes. The UK HealthCare Trauma Program Office provided financial support for the t-shirts and prizes; no additional funding was needed for development or staff education.

Description of the NDEMP

The program consists of an assessment of the patient's mobility score within 24 hours of admission to the service line. All patients are verticalized immediately as soon as blood pressure permits by elevating the head of bed at least 30 degrees or by placing patients with spinal

precautions in reverse Trendelenburg position. Mobilization activities begin upon stabilization of hemodynamic and respiratory parameters with emphasis on core engagement and weight bearing. This frequently begins within 24-48 hours of intensive care admission. Nursing staff are responsible for mobilizing patients to their maximum ability twice daily in addition to any therapy provided by Physical and Occupational Therapists. Multidisciplinary team collaboration is integral to this process and all team members including nurses, nurse care technicians, mobility techs, management, clinical nurse specialists, physicians and respiratory therapists participate in mobility activities. See Appendix C for Mobility activities.

Objectives

The purpose of this study was to evaluate the effectiveness of the UK HealthCare Trauma Surgical Services Nurse Driven Early Mobility Program (TSSNDEMP) "Walking the Road to Recovery. Specific objectives are as follows:

1. Explore the relationship between the TSSNDEMP and ICU and hospital LOS.
2. Explore the relationship between the TSSNDEMP and pneumonia and venous thromboembolism (VTE) incidence in the ICU population.
3. Explore the relationship between the TSSNDEMP and patient mobility scores at ICU and hospital discharge.
4. Explore the relationship between the TSSNDEMP and patient disposition at discharge.

Methods

Study Design

The study was an outcome evaluation using an uncontrolled before and after design with retrospective data analysis of patient data obtained from the electronic medical record (EMR) from December 2014 through April 2016. Data points were electronically extracted by the

University of Kentucky's Center for Translational Science department and then confirmed by the principle investigator examining the patients EMR as necessary.

Patients were divided into pre and post- implementation groups. The pre-implementation group consisted of 232 patients the post-implementation group consisted of 228 patients. The intervention began August 1, 2015.

Sample and Setting

This program evaluation was conducted at the University of Kentucky Healthcare, which is a Level One Trauma Center licensed for 945 inpatient beds. UK Healthcare has 8 Adult Intensive care units with 110 beds. Service lines include Trauma Surgical Service, Neurology, Neurosurgery, Medicine/Pulmonary, and Cardiothoracic. The sample for this study was 460 patients admitted to one of two trauma/surgical ICUs at UKHC. Each unit has 12 beds with patient populations managed predominately by the Trauma Surgical Service (TSS) Physicians and subspecialty services. TSS ICUs admit approximately 1700 ICU patients annually. Patient diagnoses include complex multiple-system trauma and burns, emergency general surgery, abdominal solid organ transplant, and other subspecialty surgical services.

Data were collected from December 1, 2014 through April 30, 2016 on patients admitted to one of two TSS ICUs who were over 18 years of age.

Inclusion and Exclusion Criteria

Inclusion criteria for the program evaluation study sample was all patients that are admitted to TSS ICUs eight months prior to and eight months after implementation of the TSSNDEMP (December 2014 through April 2016). Exclusion criteria will include:

1. Non-weight bearing on bilateral lower extremities
2. Unstable spine fractures

3. Patients that expired in the ICU within 1 week of admission
4. Patients with profound terminal injuries at the time of admission.
5. Patients with continuous renal replacement therapy (CRRT)
6. Patients with an open abdominal wall
7. Patients with profound inability to follow commands and work cooperatively with staff

Data Sources

The sources for data collection included:

a. Sunrise Clinical Manager (SCM) electronic medical record
b. Finance reports to determine length of stay data
c. Infection Prevention and Control

Sample Demographics

The demographic data included, but was not limited to age, gender, ethnicity, body mass index (BMI), ICU LOS, ICU readmission, and vasopressor use.

Outcomes and Evaluation

The outcome evaluation used an uncontrolled before and after design to examine patient outcomes.

Outcome Evaluation

The outcome evaluation examined the effect of the TSSNDEMP on the following outcomes:

a. Intensive care unit (ICU) and overall length of stay (LOS)
b. ICU readmissions
c. Ventilator days
d. Pneumonia

e. Venous Thromboembolism (VTE)
f. Disposition at discharge (home, outpatient rehabilitation, acute rehabilitation, long term care facility (LTAC)
g. Mobility score at ICU and hospital discharge

Outcomes were evaluated pre and post program implementation.

Definition of Variables

Diagnosis of pneumonia and VTE was obtained by including patients who had a positive diagnosis noted in the physician problem list. Mobility scores were the highest score of the day that the patient was discharged from the ICU or the hospital. Discharge disposition was pulled from the patient's discharge summary. ICU admissions were determined to be when a patient changed from an acute or progressive level of care to an ICU level of care. A trip to the OR from the ICU where the patient returned to the ICU was not counted as a separate admission. ICU LOS was obtained from the EHR and included all ICU days from that admission. Hospital LOS was obtained from the EHR and included all days during that admission. Mortality within 1 week of admission was obtained from the patients "notification of death" in the EHR.

Data Analysis

Sample demographics were described using frequencies and percentages (for categorical and ordered categorical variables) and means and standard deviations (for continuous variables). Differences in sample demographics before and after the intervention were examined using chi-square analyses for categorical/ordered-categorical variables and paired sample t-tests for continuous variables. An independent sample t-test was used to assess the differences in pre and post intervention groups on the LOS, ventilator days, and mobility scores at ICU, and at hospital discharge. Chi square analyses were used to examine differences in pre and post

intervention groups on pneumonia rates, VTE rates and hospital discharge disposition (home or to another facility) pre and post intervention facility.

Institutional Review Board

An exempt level of IRB approval was obtained.

Results

Sample Description

The sample was comprised of mostly male (58.7%) and Caucasian (94.8%) participants. The mean age was 54.4 years (sd = 16.0) and average BMI was 29.7 kg/m^2 (sd = 9.3). There were no differences in demographic variables between the pre and post samples (see Table 3).

The Effect of TSSNDEMP on Patient Outcomes

Table 4 presents the analysis of the effect of the TSSNDEMP on selected patient outcomes. ICU mobility score (pre mean score = 5.5 vs. post mean score = 7.1) and hospital mobility scores (pre mean score = 7.5 vs. post mean score = 7.9) at discharge significantly increased. There was a non-statistically significant increase in VTE (pre = 3.0% vs. post = 4.8%) and ICU days (pre mean days = 5.7 vs. post mean days = 5.8), and a non-significant decrease in discharge to home (pre = 98.3% vs. post = 96.5%). In addition, there was a non-significant decrease in pneumonia (pre = 7.3% vs. post = 5.7%) and in ventilator days (pre mean days = 2.2 vs. post mean days = 1.9). There were no appreciable decreases in LOS.

Discussion

The purpose of this program evaluation was to determine the effectiveness of the UK HealthCare Trauma Surgical Services Nurse Driven Early Mobility Program (TSSNDEMP) "Walking the Road to Recovery". A retrospective analysis of patient data obtained from the

electronic medical record (EMR) from December 2014 through April 2016 was performed to evaluate the specific outcomes of the TSSNDEMP.

There were no significant changes in length of stay for the ICU or hospital, which is consistent with several other studies (Burtin et al, 2009, Clark et al., 2013, Fraser et al., 2015). Several studies that found significant decreases in hospital and ICU LOS performed their evaluations over a longer period of time and/or had larger sample sizes (Morris et al., 2008, McWilliams et al., 2015, Klein, Mulkey, Bena & Albert, 2015 Hopkins et al., 2016). The ICU discharge and hospital discharge mobility scores significantly increased post-implementation of the TSSNDEMP. Based on mobility scores, patients were out of bed and ambulating much sooner. Several studies also had similar results with reduced ventilator days and earlier mobilization (Dong, Yu, Sun, Fang & Li, 2014, Engel, Needham, Morris & Gropper, 2013, Fraser et al., 2015, Hopkins et al., 2016, Needham et al., 2010). This increase in mobility could translate into less post intensive care disability, a quicker return to pre injury functional status, and improved quality of life.

There was a non-statistically significant decrease in pneumonia and ventilator days noted. Cost savings can be difficult to quantify, however at UK HealthCare a pneumonia diagnosis adds an additional $16,931 to each patient encounter and ventilator days add an average of $291 per day just for the ventilator (UK HealthCare Finance, 2016). Although this study did not specifically look at cost savings, it could be extrapolated from the figures obtained from UK HealthCare Finance that there are cost saving opportunities over $8,000.00 with the 1.8% reduction in pneumonia and over $400.00 with the 15% reduction in vent days. No adverse events associated with mobility occurred during the course of the study.

Limitations

It is important to recognize that in today's health care setting, multiple practice improvement projects and research studies are going on simultaneously at any given time. The short length of time, post implementation, for the evaluation was a limitation. This was a new program and there is a learning curve for staff to adjust to the program requirements; and it takes time to cement such a change into practice. T-shirts and "secret shopper" prizes, which were not available during the pre-intervention period, could have played a role in nurse compliance with the program during the introductory period. The period of inquiry was not long enough to sufficiently evaluate long-term outcomes of the program or to evaluate the effectiveness of nursing adoption of the program. Unforeseen complications with data mining resulted in a significant number of transplant and oncology surgery patients being included in the sample, which may have affected the LOS data; as these populations tend to have longer LOS for medication therapies and diagnostic exams. The plan is to repeat the evaluation after longer intervals and draw from a sample of strictly trauma patients.

Implications

Nursing leadership and financial implications. Any program that can potentially reduce patient complications, length of stay and improve functional recovery post hospitalization is worthy of consideration by nursing leadership. The TSSNDEMP had a very minimal startup cost and required no additional staffing to implement. Although this study did not specifically look at cost savings, there are potential savings that can be extrapolated from the outcomes of the study. The evaluation at this Level One Trauma Center performed only eight months post TSSNDEMP implementation showed a decrease in pneumonia which would save an average of $16, 931 per encounter and decreased ventilator days with an average potential savings of $291

(UK HealthCare Finance, 2016) per day as well as significant increases in patient ICU and hospital discharge mobility scores. Reduction of hospital acquired conditions (HAC) are consistent areas of focus in health care institutions due to multiple factors which include financial concerns related to potential increased length of stay, lack of reimbursement and associated fines. Although this study did not show reduction in LOS, as discussed earlier the short evaluation time and patient population may have been a factor. Many early mobility studies have shown reductions in LOS (Morris et al., 2008, McWilliams et al., 2015, Klein, Mulkey, Bena & Albert, 2015, Hopkins et al., 2016). Although this study did not look at hospital acquired pressure injury (HAPI) incidence, evidence indicates that early mobility does impact HAPI rates. Patients with higher mobility scores have higher levels of independent functioning and movement which reduces time lying in bed and could increase the potential for lower rates of HAPI. Ogochukwu et al. (2016) noted a significant pressure ulcer reduction in a large sample early mobility study. Lord et al., (2013) developed a model of net financial savings related to a Johns Hopkins early mobility study and determined that cost savings based on LOS reduction data alone for ICU and acute care was over $800,000.00 during the course of the study. The annual projection for savings was nearly 4 million dollars.

Nursing practice and patient outcomes. Mobility programs that are nurse driven empower nursing staff to evaluate and make recommendations for improvements in the patient's mobility plan. Although this study did not measure nursing staff satisfaction and involvement, many of the TSS nurses took special interest and ownership in the mobility plans and included family members and other disciplines in the patient care. Nursing involvement gave them a sense of ownership of patient outcomes and allows them to advocate for their patients. The staff initiated discussions among themselves and multidisciplinary team members regarding ways to

improve the implementation of the mobility plan and to distribute the workload among all shifts. Several improvements were implemented after multidisciplinary team communication regarding the availability and timing of mobility tech help in the ICUs. The techs were employed by Physical Therapy Department and based on communication with nursing staff began making rounds at set times in the units to lend an extra hand for very complex or large patients. Again, although this study did not evaluate team collaboration and physician involvement, anecdotally after the TSSNDEMP implementation nursing staff satisfaction, patient mobility and multidisciplinary relationships improved. The mobility program also increased physician involvement in and communication regarding the daily mobility plan for the patients. This communication has increased nursing staff awareness of physical requirements/criteria for patients to determine the difference between pending discharge to home versus a skilled care facility.

Early mobility not only reduces or prevents deconditioning that can affect lifelong functioning, it also improves the morale for patients and family because they perceive the ability to mobilize and ambulate as a return to normalcy (Hopkins, Weaver, Collinridge, Parkinson, Chan & Orme, 2005). Patients that mobilize early in their hospital course have lower rates of post hospital depression, deconditioning and contractures, receive less sedation which leads to less ventilator days, have lower incidence of HACs, and less permanent functional disability after discharge (Clavet et al., 2008, Dong et al., 2014, Engel, Needham, Morris & Gropper, 2013, Herridge et al, 2003, Needham et al., 2010). As noted above, evidence shows reduced HAPI rates in patients with increased mobility (Ogochukwu et al, 2016). Patients that are stronger and can move themselves more independently have less shearing and friction injuries related to movement with draw sheets or patient lifts (Arnold, 2003).

Nursing education, scholarship and further clinical inquiry. The findings of this evaluation provide evidence to support the safety and efficacy of early ICU mobility programs. In order to sustain the program, frequent updates regarding patient outcomes should be presented to the staff so that they can see the improvement resulting from their early mobility efforts. (Doody & Doody, 2011). Further sustainability could be achieved by including education regarding the TSSNDEMP as part of orientation for all new staff. It is very important that nurses think critically about early mobility and involve the patient and family in the plan from the beginning. Staff should be encouraged to read new evidence relating to early mobility and be offered enrichment activities including opportunities to participate in research to peak their interest (Doody & Doody, 2011).

Further study should look at nurse perceptions, perceived barriers, actual cost savings and adherence to early mobility programs as this study looked only at patient outcomes. Although no adverse events occurred as a result of mobility activities, it would be interesting to look at mortality data at intervals post discharge. This study should be repeated after a longer implementation time. This sample included quite a few patients that traditionally have longer hospital stays such as oncology and transplant surgery patients. It would be very interesting to look as specific populations individually. The trauma population is particularly important as there is little evidence published about early mobility in this population. Additional areas of interest in the trauma population are comparison of injury severity scores (ISS) and HAPI incidence. Much of the mobility literature is specific to pulmonary, medical and uncomplicated general surgery patients.

Conclusion

The purpose of this study was to evaluate the effectiveness of a recently implemented nurse driven early mobility program on patients in two Trauma/Surgical Intensive Care Units at the UKHC. The ability to translate current evidence into practice is imperative in order to deliver optimum patient care and prevent harm. The old practices of bedrest for critically ill patients have proven to be detrimental. Evidence supports early mobilization of the most critically ill patients as soon as hemodynamic status allows. Early mobility activities are safe and no significant adverse events related to mobility activities have been documented in the literature. The TSSNDEMP provided a standardized, safe approach for mobilizing patients that did not require addition of staff for a mobility team. Multidisciplinary communication and education regarding the risks of immobility and safety of early mobility activities increased the nursing staff's comfort with the program. Within a very short time frame, the TSSNDEMP showed a reduction in ventilator days and pneumonia as well as a significant increase in ICU and hospital discharge mobility scores. No adverse events occurred during the study. The success of this program supports the ability of nursing to mobilize patients safely utilizing the existing multidisciplinary team rather than adding staff.

Table 1: Logic Model

Category	Components
Resources and Inputs	Development of evidenced based practice nurse driven early mobility program; Physician, Leadership, and Staff engagement
Process/Activities	Development of program, education of staff and implementation of program.
Outputs	Patient outcomes.
Short term effectiveness: Outcomes	Increases in mobility scores and LOS reductions.
Long term effectiveness: Impact	Sustained improved patient outcomes: LOS, ventilator days, VTE rates, pneumonia rates and mobility score changes.

Table 2: Evaluation Plan

Evaluation	Aims/Objectives	Assessment and Evaluation	Data Sources	Outcome Measures
Outcome Evaluation	What is the effect of the NDERMP on patient outcomes?	ICU and overall LOS.	Hospital finance	Average LOS pre and post program initiation.
		Ventilator days	EHR	Average ventilator days
		Pneumonia rates	IPAC	Pneumonia rates pre and post intervention
		VTE	IPAC	VTE rate pre and post intervention
		Mobility Score	EHR	Average mobility score at ICU and Hospital discharge.
		Disposition at discharge	EHR	Percent of patients discharged home, inpatient rehabilitation and long term acute hospital (LTAC)

Table 3. Sample Characteristics

	Total		Pre		Post		Difference	
	N	%	n	%	n	%	Chi Square (DF)	P value
Gender							0.17 (1)	.681
Female	190	41.3	98	42.2	92	40.4		
Male	270	58.7	134	57.8	136	59.6		
Ethnicity							0.21 (1)	.643
Caucasian	436	94.8	221	95.3	215	94.3		
Non-Caucasian	24	5.2	11	4.7	13	5.7		
Admitting Service							3.19 (6)	.785
Trauma Surgery	147	32	71	30.6	76	33.3		
Transplant Surgery	39	8.5	21	9.1	18	7.9		

Vascular Surgery	125	27.2	60	25.2	65	28.9		
Oncology Surgery	131	28.5	72	31	59	25.9		
Burn	13	2.8	5	2.2	8	3.5		
Plastic Surgery	5	1.1	3	1.3	2	0.9		
	M	SD	M	SD	M	SD	T-test (DF)	P value
Age	54.4	16.0	54.3	17.0	54.5	15.0	.12 (458)	.909
BMI	29.7	9.3	29.9	9.3	29.5	9.2	.43 (456)	.670

Note. Differences in demographic variables were examined using chi square tests for categorical variables and independent sample t-tests (with Levene's test for equality of variances) for continuous variables.

Table 4. Outcome of TSSNDEMP

Patient Outcomes	Total		Pre		Post		Difference	
	N	%	n	%	n	%	Chi Square (DF)	P value
Pneumonia	30	6.5	17	7.3	13	5.7	0.50 (1)	.480
VTE	18	3.9	7	3.0	11	4.8	1.00 (1)	.318
Home Discharge	448	97.4	228	98.3	220	96.5	1.44 (1)	.230
	M	SD	M	SD	M	SD	T-test (DF)	P value
Ventilator Days	2.1	5.1	2.2	5.8	1.9	4.3	.31 (458)	.579
ICU Days	5.7	6.4	5.7	6.6	5.8	6.2	.01 (458)	.931
ICU Admissions	1.2	0.6	1.2	0.5	1.2	0.6	.00 (458)	.998
ICU Mobility at Discharge	6.3	2.5	5.5	2.7	7.1	2.0	7.2 (408)	< .0001

Mobility at Hospital Discharge	7.7	1.1	7.5	1.5	7.9	0.5	3.6 (290)	< .0001

Note. Differences in demographic variables were examined using chi square tests for categorical variables and independent sample t-tests (with Levene's test for equality of variances) for continuous variables.

Appendix A

Comprehensive Literature Review Table

Author/Year	Level of Evidence	Study Design	Sample/Measures	Key Findings/Implications	Sustainability
Bailey, P. et al., (2007).	III	Prospective cohort study.	N=103. All mobility/activity events.	Majority of patients were able to ambulate .100 feet at discharge from the Resp ICU. Less than 1% adverse events were noted. None was life threatening.	Repeatable, generalizable.
Burtin, C. et al., (2009).	I	RCT	Patients admitted to the ICU N = 90	No difference in ICU LOS, quadriceps or berg balance scale.	Repeatable, generalizable.
Clark, D.E., Lowman, J.D., Griffin, R.L., Matthews, H.M. & Reiff, D.A. (2013).	III	Retrospective cohort study	Patients admitted to the TBICU Pre intervention N = 1,044 Post intervention N = 1,132	No statistically significant decrease in ICU or hospital LOS or vent days. No adverse events occurred related to mobility. There were statistically significant reductions in pneumonia and VTE.	Repeatable, generalizable.
Clavet, H., Hebert, P.C., Fergusson, D., Doucette, S. & Trudel, G. (2008).	III	Retrospective chart review of ICU patients looking at joint dysfunction at ICU discharge.	N=155 tertiary ICU patients with LOS 2 weeks or longer. Evidence of joint dysfunction.	At least 1 joint contracture noted in 36% patients, 34% had contractures documented that would impair function, 8 week or longer stay significantly associated with greater risk of contracture. 50% of patients still had significant contracture almost 7 weeks post ICU discharges.	Repeatable. Results somewhat generalizable.

				Steroids seemed to protect joints from contracture. Limb contractures impair ADLs	
Covinsky, K.E.et al., (2003).	III	Prospective observational study. Patients interviewed at admission (regarding 2 weeks prior to admission and at admission) and discharge regarding functional status. Looking at changes in functional status.	N=2293 Cognitive screen: Short Portable Mental Status Questionnaire. In depth interviews regarding functional status and ADLs	35% of patients had functional decline between discharge and admission. Greater age tends to come with greater decline. Up to 50% of patients 85 and older had significant decline.	Repeatable. Results generalizable to population.
De Jong, B. et al., (2007).	III.	Prospective observational	Patients in medical, surgical, and combined units in 3 hospitals. N = 116	Respiratory and limb muscle strength are altered after 1 week of mechanical ventilation. This is associated with delayed extubation.	Repeatable, generalizable
Dong, Z.H., Yu, B.X., Sun, Y.B., Fang, W. & Li, L. (2014)	I	RCT	Patients on mechanical ventilation > 48 hours N= 60	Out of bed 3.5 days sooner, vent days reduced 7.1 days, ICU LOS reduced by 2.5 days	Repeatable. Results generalizable to population
Engel, H.J., Needham, D.M., Morris, P.E. & Gropper, M.A. (2013).	III	Evaluation of quality improvement projects.	Patients admitted to the ICUs. Group 1 pre-intervention n =165, post intervention n = 165. Group 2 pre intervention n = 27, post intervention n= 30. Group 3 pre intervention n = 179, post intervention n = 294.	No adverse events noted. Decreased doses of sedatives, decreased ICU and hospital LOS, decreased delirium rates, increased distance walked in ICU and increased percent of patients discharged home instead of rehabilitation facility.	Repeatable. Results generalizable to population\

Fink, H., et al., (2008).	III	Prospective randomized experimental study. Animal study on rats.	N=55 Compared SIRs rats with health immobilized rats.	Inflammation and immobilization both independently lead to muscle weakness.	Repeatable. Results generalizable.
Fraser, D., Spiva, L., Forman, W. & Hallen, C. (2015).	III	Retrospective longitudinal study with pre and post sample.	Patients admitted to surgical, medical or coronary care ICU. n = 66 pre n = 66 post	Intervention group has a slightly longer LOS but the mean cost of the stay was lower. The intervention group had higher mobility score increases from ICU to hospital discharge and got out of bed 2.5 times more than the usual care group. Intervention group less likely to go to rehab facility than usual care group.	Small sample size at one hospital. Repeatable, generalizable
Herridge, M.S. et al., (2003).	IV	Longitudinal interview study of ARDS survivors.	Survivor interviews at 3, 6, and 12 months. N = 109	Survivors of ARDS have persistent functional disabilities one-year post discharge from the ICU. Muscle wasting and weakness are very common. These weaknesses may contribute to pulmonary symptoms as well.	Prevention of muscle deterioration may mitigate long-term disabilities. Further study needed.
Hopkins, R.O., Weaver, L.K., Collinridge, D., Parkinson, R.P., Chan, K.J. & Orme, J.F. (2005).	III	Evaluation of patients from an earlier RCT. Followed 2 years post original study.	ARDS patients that participated in a RCT. N = 66-year one N = 62-year two	ARDS survivors had 70% had neurocognitive sequel at hospital D/C, 46% at year one, 47% year two. Minimal depression and anxiety were noted at year 2.	ICU stay for ARDS can have significant impact on the survivor that is long lasting. This is an area that needs further study.

Hopkins, R.O., Mitchell, L., Thomsen, G.E., Schafer, M, Link, M. & Brown, S.M. (2016.).	III	Outcomes evaluation of early mobility program in pulmonary ICU, medical ICU, shock trauma ICU.	All patients admitted to the unit that met inclusion criteria	69.4% of patients ambulated 100 ft prior to ICU d/c. Time to extubation dropped as well as ICU LOS	Repeatable results generalizable
Jolley, S.E., Dale, C.R. & Hough, C.L. (2015).	III	Cross sectional interview study of nurse managers.	Managers of ICUs with ventilator patients. N = 47	Managers at ¾ of eligible hospitals reported early mobility in mechanically ventilated patients.	Hospitals with high volume and academic affiliation had higher levels of early mobility. Presence of written ICU activity protocol was associated with mobility being reported in more critical patients.
Klein, K., Mulkey, M., Bena, J.F. & Albert, N.M. (2015).	III	Prospective, pre-post cohort study	Neurologic ICU patients N = 637	Increase in ability to bear weight, pivot, Decreased ICU LOS by 2.55 days, decreased overall LOS by 5.06 days, 5% more likely to discharge home rather that other level of care.	Repeatable, generalizable.
Lee, H. et al., (2015).	III	Retrospective review	Medical ICU patients N = 99	No safety events that increased patient cost or LOS occurred.	Repeatable, generalizable.
Lee, N.P., DaSilva, G.M.C., Park, M. & Pires-Neto, R.C. (2015).	III	Retrospective chart analysis	ICU patients N = 275	No association between catheter related adverse events and mobilization in ICU.	Repeatable generalizable

McWilliams, D. et al., (2015).	III	Retrospective chart review of early mobility intervention with a rehab team.	Patients that were mechanically ventilated in a mixed ICU pre and post intervention. n = 290 pre n = 292 post	ICU rehab team was associated with a significant increase in mobility at ICU discharge, significant reduction in ICU LOS, vent days and hospital LOS as well as in hospital mortality.	Early mobility is beneficial and feasible.
Morris, P.E. et al., (2011).	I	RCT	Acute respiratory failure N = 258	Lack of early mobility was predictive of hospital readmission and increased mortality	Repeatable results generalizable
Morris, P.E. et al., (2008).	I	Prospective randomized cohort study	Acute respiratory failure ICU patients N = 330	Out of bed at 5 vs 11 days, Shorter ICU LOS by 1.4 days, Shorter overall LOS by 3.3 days	Repeatable results generalizable
Needham, D.M. et al., (2010).	III	Prospective pre and post quality improvement project.	Patients in a medical ICU. N = 57	Reduced benzodiazepine use and increased staffing of PT/OT for increased patient visits. Benzodiazepine use reduced by 50%, Reduced delirium, and 6 more PT/OT visits per patient than before intervention. ICU LOS decreased by 2.1 days and hospital LOS decreased by 3.1 days.	Early mobility safe and effective. Increased positive outcomes.
Ogochukwu, A. et al., (2016).	III	Evaluation of a quality improvement initiative.	N = 3,233 Evaluated effects of new mobility plan using wound care nurses and patient mobility assistants.	Pressure ulcer rate dropped significantlyfrom9.2 to 6.1%. Hospital readmission dropped, as well as ICU LOS.	

Pandullo, S.M. et al., (2015).	III	Retrospective analysis	Patients in a 24 bed ICU taking medical, surgical and trauma patients. N = 182	Delay of up to2.5 - 16 hours noted between ICU discharge and first full ward day. Only 41% patients ambulated on the day of discharge. Patients that ambulated in the ICU has shorter LOS compared to those that did not.	Repeatable, generalizable
Perme, C., Nalty, T., Winkelman, C. Kenji Nawa, R. & Masud, F. (2013).	IV	Prospective observational study	n = 77 Observed for complications with physical therapy in patients with femoral catheters.	No evidence of any complications thrombotic or catheter malfunctions was observed.	Repeatable, generalizable.
Sricharoenchai, T., Parker, A.M., Zanni, J.M., Nelliot, A., Dinglas, V.D. & Needham, D.M. (2014).	II	Prospective evaluation	N = 1,110 medical intensive care unit patients that received physical therapy.	Out of more than 5,200 PT sessions, there was 1 fall, 2 feeding tube and one arterial line inadvertent removal. There were no lasting effects for any of the patients.	Repeatable, generalizable.
Schweickert, W.D. et al., (2009).	I	RCT. Daily sedation interruption with early mobilization and exercise vs daily sedation interruption with routine therapy as ordered by primary team. Patients recruited from 2 major medical centers.	Return to independent functional status AEB ability to walk independently and perform six ADLs: transfer from bed to chair, use toilet, eating, bathing, dressing and grooming. N=104	59% of patients in the intervention group returned to baseline status vs 35% in the usual care control group. Intervention group has less delirium, less vent days.	Repeatable. Results generalizable to population.
Zomorodi, M., Topley, D. & McAnaw, M. (2012).	III	Protocol development and pilot study. Is early an early mobility protocol safe and feasible in	Patients in a trauma/surgical ICU. Very small convenience sample of 3 patients. Convenience sample. (similar facility to UK)	LOS for participant's less than average SICU patients, VS remained stable and no self-removal of lines or tubes occurred. Next step RCT.	Small sample size limits generalizability of results.

		trauma /surgical patients? Does the early mobility protocol decrease ventilator days? What are the effects of an early mobility protocol on VS and perceived effort?	Patient demographics, admission diagnosis and co morbidities, VS, LOS, Borg Rate of perceived Exertion Scale, Ventilator *free* days.		
Winkelman, C. et al., (2012).	II	Prospective repeated measures study with control and intervention groups N = 20 control N = 55 intervention	5% of patients had concerning alteration in respiratory rate or peripheral oxygenation. No other adverse events occurred. Findings suggested that early progressive exercise reduced inflammation rates. The greater the duration of exercise the lower the inflammatory marker level was.		
Winkelman, C. & Peereboom, K. (2010).	IV	Descriptive study of staff perceptions regarding progressive early mobility. Nurses providing care to a sub sample of patients from a larger mobility study. N = 33	Nurses cited safety concerns related to vital sign changes, fear of inadvertent line or tube removal. Some cited sedation or agitation as barriers, PT consults did not affect the nurse's perceptions.	Staffing was not considered a barrier or facilitator.	Small convenience sample from one hospital.

Author/Year/ Journal/Title/Reference Information	Type of Literature/Design	Findings/Results/Evidence	Implications
Adler, J. & Malone, D. (2012).	Systematic review of literature	As technology improves and more patients survive, IVU survivors are experiencing higher rates of morbidity.	No serious adverse events were noted in over 1,449 activity sessions while in ICU. The most common event was desaturation, which is expected to a certain extent. Overall, early mobility showed positive gains on respiratory and physical strength and decreased time to meet physical mobility milestones.
Appleton, R. & Kinsella, J. (2012).	Review of definitions of CIP, CIM and CINM.	Review of Pathophysiology and risk factors. Critical Illness Polyneuropathy and Myopathy overlap. High dose steroids and neuromuscular blocking agents increase risk.	Early mobility absolutely vital. Maintaining euglycemia very important. FES of BLE may be helpful.
Dowdy, D.W., Eid, M.P., Sedrakyan, A., Mendez-Tellez, P.A., Pronovost, P.J., Herridge, M.S. & Needham, D.M. (2005).	Systematic review of literature.	ICU survivors have lower quality of life post discharge that persists during long-term follow up.	Early mobility is a vital step in reducing post discharge disability, which can be lifelong.
deJonghe, B., Lacherade, J.C., Sharshar, T. & Outin, H. (2009).	Review of causes and prevention strategies for ICUAW.	Risk factors for critical illness neuropathy include multiple organ failure, limb immobilization, deep sedation, Hyperglycemia, neuromuscular blocking agents and corticosteroid use.	ABCDE bundle reduces risk.

Herridge, M.S., Batt, J. & Hopkins, R.O. (2008).	Review of poor outcomes following critical illness.	Studies have noted long-term disabilities that persist up to 6 years post ICU stay. Critical illness polyneuropathy and myopathy are common. Often precipitated by hyperglycemia and inflammation from SIRS and sepsis. Neurogenic abnormalities can be precipitated by hypotension, hypoxemia, delirium, sedatives and analgesics.	Any intervention such as the ABCDE bundle that minimizes drug use, immobility and ICU stay could have positive benefits for the patient.
Hogdson, C.L., Stiller, K., Needham, D.M., Tipping, C.J., Harrold, M., Baldwin, C.E., Bradley, S., Berney, S., Caruna, L.R., Elliot, D., Green, M., Haines, K., Higgins, A.M., Kaukonen, K.M., Leditschke, I.A., Nickels, M.R., Paratz, J., Patman, S., Skinner, E.H., Young, P.J., Zanni, J.M., Denehy, L. & Webb, S.A. (2014).	Recommendations for safety criteria. Literature review and meeting of ICU experts.	Respiratory, cardiovascular, neurological and other areas identified. Areas to consider were ventilator status, hemodynamics, dysrhythmias, LOC, delirium, ICP, lines and surgical or medical conditions. Used a traffic light approach to categorize risks.	Early mobility safe and feasible.
Hopkins, R.O., Suchyta, M.R., Farrer, T.J. & Needham, D.M. (2012).	Effects of exercise on the brain.	Early activity may reduce delirium and improve neuropsychiatric function. Cognitive impairment is noted in up to 70% of ICU survivors. Causes are likely multifactorial and have synergistic effects. In multiple animal studies, early mobility is associated with reduces duration of delirium, improved physical function, decreased LOS and mortality.	Animal results should be generalizable to the human population.

Hopkins, R.O., Spuhler, V.J. & Thomsen, G.E. (2007).	Tips for culture change.	Using the eight-stage change process: establish a sense of urgency, create a guiding coalition, create and communicate a vision, empower others to act, plan and create short term wins, consolidate improvements and facilitate more change and institutionalizing new approaches.	Multidisciplinary involvement is vital as well as support and buy in from administration.
Knight, J., Nigam, Y. & Jones, A. (2009).	Effects of bedrest on body systems.	Immobility effects every body system in a negative manner.	Early mobility activities in the critically ill population can prevent or mitigate the effects of bedrest.
Lord, R. K., Mayhew, C. R., Korupolu, R., Mantheiy, E. C., Friedman, M. A., Palmer, J. B. & Needham, D. M. (2013).	Review of Financial saving of an early mobility/rehabilitation program.	Studies demonstrate that early rehab decreases LOS. Study looked at reduction in LOS post program, per day cost savings from decreased LOS, Costs of implementing the program, annual number of ICU admissions.	Johns Hopkins demonstrated a significant cost saving after initiating an early mobility program.
Hopkins, R.O.,& Spuhler, V.J. (2009).	Strategies for promoting mobility.	Prolonged immobilization leads to neuromuscular abnormalities, long-term functional disability, and ICU acquired weakness. Decline in physical status is noted more so than emotional or mental status.	Mobility in this population is safe and evidence based.
Morris, P.E. (2007).	Review of mobility issues.	ICU patients have 1-1.5% decline is skeletal muscle strength per day of bedrest. Patients with ARDS may lose	Immobility is detrimental.

		up to 18% during their hospitalization. Many ICU patients complain of severe physical limitations after hospitalization.	
Morris, P.E. & Herridge, M.S. (2007).	Review of current practice, problems and future directions.	Incidence of critical illness polyneuropathy is as high as 25%. Utilization of the ABCDE bundle is essential to increasing early mobility.	Early Mobility safe and effective
Needham, D. (2008).	Systematic Review	Healthy, well-nourished individuals lose 4-5% muscle strength for each week of bedrest. BR causes fluid shifts causing postural hypotension, tachycardia and decreased SV and CO, as well as insulin resistance and microvascular dysfunction. Typically, only approximately 20% of ICU patients receive PT or mobility therapy.	Reduction of heavy sedation and early mobility are key.
Parker, A. & Needham, D.M. (2013).	Review of literature regarding safety of and barriers to early mobility.	There is a very low incidence of accidental line removal with early mobility in the ICU. Early mobility increases the likelihood of return to independent functional status. Early mobility decreases LOS and vent days. Deep sedation is a definite barrier, inadequate staffing for mobility activities is another barrier.	Early Mobility safe and effective
Perme, C. & Chandrashekar, R. (2009).	Outline of plan and implementation for an	Four Phase program for mobilizing ICU patients	Early mobility safe and effective in the ventilated population.

	early ICU mobility intervention program.		
Ross, A.G. & Morris, P.E. (2010).	Safety of early mobility activities.	Most early mobility studies report few if any adverse events. Barriers include lack of adequate equipment, lack of coordination of personnel, and staff misperceptions regarding early mobility. Lack of administration buy in is also a factor.	Early Mobility safe and effective
Stevens, R.D., Dowdy, D.W., Michaels, R.K., Mendez-Tellez, P.A., Pronovost, P.J. & Needham, D.M. (2007).	Description of prevalence, outcomes and risk factors of critical illness neuromuscular abnormalities.	46% of ICU patients diagnosed with CINMA. Risks include poor glycemic control, SIRS, sepsis, MODS, CRRT, and catecholamine administration. . Mechanical vent and LOS were increased with CINMA.	Large prospective studies needed.
Stiller, K. (2007).	Review of safety issues with early mobility.	Note that HR, RR and blood pressure increases of up to 10-20% are expected. Temporary/transient desaturations Significant decreases are much more concerning. Concerning events are arrhythmias suggesting perfusion issues, angina or new onset arrhythmias. Active bleeding causing hemodynamic instability is a safety concern.	Mobilization improves resp. function increases LOC, increases functional independence, improves cardiovascular fitness, and psychological wellbeing. For critically ill patient it can shorten recovery time, decrease vent days and ICU and hospital LOS.
Stevens, R. D., Marshall, S. A., Cornblath, D. R., Hoke, A., Needham, D. M., de Jonghe, B., Ali, N. A. & Sharshar, T. (2009).	Description of syndrome of neuromuscular dysfunction related to	3 groups noted myopathy, polyneuropathy and prolonged pharmacologic neuromuscular blockade. Neuropathy may persist for weeks to months. Critical care acquired weakness	Consider risk factors, early mobility and minimization as possible of sedation and NMBAs key.

	critical illness and treatment.	is weakness in the absence of any other causative factor. Risk factors include sepsis, MSOF, mechanical ventilation, exposure to glucocorticoids or NMBA or poor glycemic control	
Vollman, K. M. (2013).	Review of current evidence about mobility and the critically ill patient.	Prolonged gravitational equilibrium (prolonged supine positioning). reduces plasma volume, increases insulin resistance, and promotes hemodynamic instability and lowered capacity to vasoconstrict in response to hemodynamic changes.	Patients should be screened within 8 hours of admission and at a minimum every 24 hours thereafter. Begin a lateral rotation schedule as soon as patient can tolerate it hemodynamically. Consider speed of turning to limit inner ear (pressure receptors) influences on cardiovascular response. Physiologic rest and preoxygenation can help when mobilizing critically ill patients.
Vollman, K. M. (2010).	Review of importance of early mobility.	Negative outcomes from reduced mobility include ventilator-associated pneumonia, longer ventilator days, pressure ulcers, diminished quality of life after discharge with significant functional limitations.	Early mobility interventions are safe and effective.
Winkelman, C. (2007).	Bedrest has significant detrimental effects	Largest organ in the body is skeletal muscle. Muscle is rapidly affected by disuse. Ambulation and turning are the most commonly missed nursing interventions in the hospital.	Early mobility is vital as deterioration of muscle begins within 4 hours of bedrest. Changes in skeletal muscle affect lung function and diaphragmatic endurance. Hemodynamic instability begins within 48 hours of bedrest as well as cytokine release and inflammation. Mood alterations such as anxiety, hostility and depression can occur.

Wong, K, Trudel, G., & Laneuville, O. (2015).	Prolonged immobility causes joint contractures.	Joint contractures cause pain, which further restricts mobility.	Contractures can be prevented by prescribed and implemented mobility activities including range of motion.

Appendix B

Evidence Grading Criteria

Evidence Level	Criteria
I	Randomized control trials. Includes quasi- randomized processes such as alternate allocation
II	Non-randomized control trial. A prospective study with predetermined eligibility criteria and outcome measures.
III	Observational studies with no controls. Includes retrospective, interrupted time studies, cohort studies with controls, and health services research that includes adjustment for likely confounding variables.
IV	Observational studies without controls. Cohort, case series and case control.

http://www.ahrq.gov/

Evidence Grade	Criteria
A	Consistent level 1 studies
B	Consistent Level 2 or 3 studies, or extrapolation from Level 1 studies
C	Level 4 studies, or extrapolation from Level 2 or 3 studies
D	Level 5 studies, or troublingly inconsistent or inconclusive studies from any level

CEBM: Grades of Recommendation

Appendix C

UK HealthCare Mobility Scale

UK HealthCare Mobility Scale

Please reference General Mobility and Ortho/Trauma/Spine guidelines for specific instructions.

Our Goal: Early Progression of Best Possible Mobility
Based on Patients' Success with Previous Steps

Score	Activity	Length of Time	How Often
Patient Immobile			
0	Patient completely immobile or prone	n/a	n/a
1	Turn depending on need. HOB less than 30 degrees	Every 1-2 hours	Every 1-2 hours
Patient in Bed			
2	HOB elevated 30 or greater and less than 45 degrees	5-10 minutes	2-3 times per day
3	Head of bed elevated 45 to 64 degrees; legs in dependent position.	10-20 minutes as tolerated	2-3 times per day
4	Head of bed elevated 65 degrees or greater; legs in dependent position (to be used when pt to chair with lift).	10-30 minutes, up to 1 hour as tolerated	2-3 times per day
Patient - Sitting/Standing			
5	Patient positioned on edge of bed (EOB); legs dangling with assist for balance and safety. * (see note below)	5-15 minutes	1-2 times per day Note: Pt to sit on EOB with minimal assist (for balance) before advancing
6	Initiate standing/side stepping/ marching at EOB	1-5 minutes	1-2 times per day
7	Initiate stand-pivot or steps to chair (Reposition in chair every 30 min. Refer to #4 if using lift.)	2 hrs maximum	2-3 times daily as tolerated
Patient Ambulating			
8	Ambulation with assist as needed	Distance as tolerated	2-3 times daily as tolerated

*Consider having 2 people to assist for scores/activities 3-6

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