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Increasing Early Mobility of Patients in the Intensive Care Unit

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Abstract

This project occurred in a 35-bed intensive care unit at a level II trauma center in central California. The purpose of this project was to strengthen the implementation of evidence-based initiatives promoted by the Society of Critical Care Medicine. The Society of Critical Care Medicine has a set of initiatives for the intensive care units nationwide to improve the outcomes for patients. One of the initiatives is the ICU Liberation, which includes six different bundles labeled: A, B, C, D, E, & F (Society of Critical Care Medicine ,2013). Their studies showed a significant improvement in the outcomes for the ICU patient according the Society of Critical Care Medicine.

Post intensive care syndrome and intensive care delirium has been decreased through mobilizing the ICU patients early upon admission (Hopkins, Mitchell, Thomsen, Schafer, Link, & Brown, 2016). Increased early mobility of both ventilated and non-ventilated patients has shown to increase muscle strength, improve quality of life and physical function. This led a reduction of length of ventilator days and the entire length of stay, therefore saving thousands of dollars (Lord, Mayhew, Korupolu, Mantheyy, Friedman, Palmer, & Needham, 2013)

The implementation of early mobility into the ICU workflow and consistently applying early mobility to every patient, every day, is the goal for this project. It will require the assistance of all stakeholders: nurses, intensivists, respiratory therapists, and physical therapists. Providing continuous education and identifying barriers is an important part of implementing early mobility. This will assist in removing barriers and allowing this project to be successful (Castro, Turncinovic, Platz, & Law, 2015). Pre-project surveys, post-project survey, and weekly audits will be valuable tools to identify barriers, implement changes or provide further education if needed.

Early Mobility of Patients in the Intensive Care Unit

The purpose of this project is to improve patient outcomes in the intensive care unit (ICU) by providing early mobility. Early mobility consists of several levels, but the most beneficial levels include patient participation, whether it is sitting on the side of the bed to ambulating down the hallway. This project was implemented into a microsystem of a 35-bed ICU at a level II trauma center. It was a mixed ICU, meaning it includes cardiac, neuro, surgical, and medical critical care units. Compare to other similar ICUs at other facilities, this unit has fallen below the benchmark for mobility. It is my goal to increase the early mobility in my ICU by 40% through staff education, auditing, team collaboration, and patient / family education as well. Survivors of the ICU are patients that required the critical care and attention of the ICU environment and expertise, then stabilized and transferred out of the unit. A large percentage of these survivors do not leave the ICU without a functional or mental impairment that will affect them for the rest of their lives. These impairments are related to ICU-acquired weakness or ICU delirium. According to the Agency for Healthcare Research and Quality (2017), approximately 50% of intensive care survivors are affected by physical impairments.

According to Kress & Hall (2014), the ICU-acquired weakness has been linked to the muscle wasting due to immobility and over 60% of ICU patients developed long-term physical function impairments. Several studies have shown that mobilizing ICU patients early, even while on mechanical ventilation, has decreased ICU-acquired weakness and ICU delirium (Calvo-Ayala, Khan, Farber, Ely, & Boustani, 2013; Puthuchearry et al., 2013). Various interventions were studied, but the only intervention that was effective with improving physical function impairment was early interventions with physical therapy and exercise (Calvo-Ayala, Khan, Farber, Ely, & Boustani, 2013). The Society of Critical Care Medicine encouraged the

implementation of the ICU Liberation Bundle (“A,B,C,D,E”), which will help decrease ICU delirium, improve neuromuscular weakness of critical patients, and decrease the amount of time on the ventilator (Society of Critical Care Medicine, 2013). My improvement project is focused on decreasing the length of stay in the ICU by implementing the ICU liberation initiative into the daily care of the ICU patient. The priority and focus will be on the early mobility section (“E”) of the ICU Liberation bundle.

Clinical Leadership Theme

The clinical leadership competency will be as a leader of a interprofessional team to implement a quality improvement project and as an educator regarding the early mobility of ICU practice. The CNL competency roles will include roles as educator, team manager, information manager, and an outcomes manager. The most current information of this evidence-based practice will be incorporated into educational materials for the staff members. A team of various intradisciplinary members will be developed, which will include a charge nurse, intensivist, physical therapist, and a respiratory therapist. Meetings will be held to develop a plan that will assist making this project successful. Frequent audits and monitoring will be used to assess the progress of mobilizing the patients over the next few months and observe for potential barriers. With the assistance of the project team members, potential barriers will be assessed and solutions will be found for these barriers.

My global aim statement is to improve the early mobility of the ICU patients according to the criteria established by Society of Critical Care Medicine. The Society of Critical Care Medicine passed an initiative in 2013 to improve patient outcomes within the intensive care unit (Society of Critical Care Medicine, 2013). This will include a daily assessment of each patient in

the ICU and determine if they qualify for early mobility under the hospital's policies and guidelines.

Statement of the Problem

My project unit has been struggling to reach the benchmark goal (80%) for early mobilization of the intensive care patients. It is the recommendation by the Society of Critical Care to implement an early mobility program within the intensive care unit throughout the nation. Studies have shown that when patients are mobilized early within their admission to the ICU, patient outcomes improved and the length of stay in the ICU were reduced (Castro, Turcinovic, Platz, & Law, 2015). The decrease in mobility contributes to a loss of muscle strength from 3% to 11% each day the patient is on bedrest in the ICU setting (Hashem, Parker & Needham, 2016). Early mobility is also linked to a reduction of ICU delirium, which is seen frequently in ICU patients (Hopkins, Mitchell, Thomsen, Schafer, Link & Brown, 2016)

Also, patient ambulation is the most frequently missed nursing care according to Kalisch, Landstrom, & Hinshaw (2009). Ambulation of critical care patients require time and coordination of team members to assist with the patients. After interviewing intensive care nurses regarding ambulating patients, the main complaint was not having enough staff to assist with early mobilization of their patients. There is more pressure placed on healthcare workers to work with less assistance while providing patient care, maintaining all policies and regulations and completing all charting by the end of shift.

Project Overview

According to the Critical Care Dashboard – Performance Report, 76.4% of patients from a comparable ICU received early mobility compared to 26.4% of the project ICU. The plan is to improve the early mobility of our critical care patients by implementing part of the ABCDEF

bundle, starting February 12, 2018. By April 28, 2018, our ICU will have 90% of the early mobility section (“E” portion of the bundle) electronically charted and completed daily. The level of early mobility of the ICU patient will also increase by 50%.

There was a visitation to the comparable ICU and their methods were observed as they mobilized their ICU patients. Interviews were conducted at this comparable ICU, barriers identified, and methods used to remedy these barriers. Meanwhile, pre-project audits of the project’s ICU charting and early mobilization were performed. Staff was requested to take a survey to help identify barriers within the project’s ICU (Appendix A). The main barriers from the survey were inadequate staffing levels, the ability to coordinate a team to provide early mobility and remember to chart every shift. During the implementation of the project, the ABCDE bundle charting and audits will be performed monthly. Staff will be interviewed during this process to identify barriers for the early mobility of their patients. As the barriers are identified, they will be addressed with the team members for possible solutions. Follow up will be provided as new changes are implemented into the workflow.

Objectives

- 1) Develop an education plan for our ICU nurses. Once they understand the importance of the early mobility portion of the ICU Liberation initiative, they will be motivated to help their patients progress.
- 2) Work with my manager on maximizing resources to assist with mobilizing patients
- 3) Develop an early mobility team committee. I would like to have it consist of the following members: Intensivist, physical therapist, a respiratory therapist, one of our resource nurses, a charge nurse and a patient care tech.

- 4) Implement and coordinate early mobility workflow of the ICU patients. It will be our goal for the patient to achieve Level III or IV according to the early mobility levels (see Appendix C).

Rationale

Root Cause Analysis

The Society of Critical Care Medicine (2013), presented successful protocols into the ICU workflow which allows the patients to have less days on the ventilator and receive early mobility. These protocols implemented are known as the ABCDEF bundles. This has decreased the length of stay in the ICU throughout the nation at various hospitals. According to Parker and Needham (2013), early mobility of patients in the ICU has been considered safe and beneficial for the patients. It has reduced ICU delirium, reduced mechanical ventilation, reduced ICU length of stay, improved muscle strength and improved functional independence.

Various potential barriers were assessed in the project's microsystem. A pre-project survey was used to assess these barriers (Appendix A), as it gave valuable information on the potential barriers and where to start. It showed that staff members were familiar with the term "early mobility" and it is very beneficial for the patients. It also showed that they were satisfied with the current mobility levels of the patients, and the staff's views of barriers were teamwork, patient stability and workload. The results were also displayed in graph format to show an overall picture of the survey (Appendix B). Personal interviews of staff indicated other results which was different than the pre-project survey. There was a knowledge gap regarding early mobility according to the ICU Liberation standards and understanding the various levels of mobility (Appendix C). There are four levels of early mobility and it is the goal for the patients

to achieve Levels III and IV. The audits indicated that the charting for the mobility was not at 100%, therefore it was difficult to assess which levels the patients were achieving in the ICU.

A fishbone diagram was developed to list the root cause of the barriers for early mobility. It included a knowledge gap of the ICU staff, the availability of staff, available equipment, and the processes or protocols used in the unit (Appendix D).

Cost Analysis

A study by Sharma, Bendas, & Arkless (2018), showed an increase of ICU patient mobility by 59%, thus leading to a decrease of ICU length of stay and decreased ventilator days. This example of an improvement project provided fiscal benefits to the organization and the patients. According to the 2013 charge sheet for California, provided by Office of Statewide Health Planning and Development (2017), the daily cost of an ICU room is \$9122.00. The additional cost of the patient on the ventilator adds a daily cost of \$1102.00. Respiratory failure is the most common cause of admission into the ICU and mechanical ventilation increases that length of stay (Hunter, Johnson, Willis, & Coustasse, 2014). Therefore, I added in the additional daily cost of mechanical ventilation to the daily cost of the ICU stay. According to Lord et al. (2013), the average length of stay in the study ICU project was 5.4 days and it was reduced to 4.2 days after two years of implementing the early mobility program. Their study included approximately 900 admissions annually, over a five-year span, which included two years prior to the program, the first year implementing the program, then two years post-implementation. The savings after their program was \$30,644,522.80.

A similar budget and savings estimate was applied to this project conducted February 2018 to April 2018 within the ICU with an estimated annual admission of 3000 patients (Appendix E). The data for the admissions and length of stay (LOS) was gathered from the

facility's performance scoreboard. The amount of personnel stayed the same since there was no additional personnel hired for the early mobility project. An additional budget for the costs of educational materials and meetings were added into the estimate. The average LOS for ICU patients was 3.2 days prior to implementing the early mobility project. After two months of implementing the early mobility project, the average LOS was 2.8 days. If this trend was to continue for the rest of the year, there will be a savings of \$12,267,300.00.

Change Analysis

The implementation of early mobility into the ICU was done in several steps. The Lippitt theory supported the steps of the implementation for this project (Mitchell, 2013). The project ICU implemented the evidence-based initiative, otherwise known as the ICU Liberation by the Society of Critical Care (Society of Critical Care, 2013). While auditing the performance of implementing the ICU Liberation bundles, it was noted that the early mobility section was approximately 60% below other similar ICUs. This would correlate with the first phase of this theory. There was an interest on how these other ICUs were more successful with their early mobility program. This triggered a motivation to discover other methods to make this early mobility program successful within the project's ICU. The motivation corresponds to the second phase of the Lippitt theory.

The third phase of the theory would lead to a visit at an ICU which has a successful early mobility program. There was motivation to improve patient outcomes and achieve a more successful program. During the visit to the other facility, many staff members were interviewed, and the workflow was analyzed. This provided suggestions and other ways to implement this project into the current workflow of the project ICU. It provided encouragement to know that providing early mobility is possible, which leads to phase four of the theory. Analysis of

potential and real barriers were identified, plans to implement staff education were developed, and performing frequent audits were considered.

Involving various stakeholders in promoting and implementing early mobility was associated with phase five of the theory. Early mobility requires the assistance of a team; therefore, all members of the team should be involved. This would include nurses, patient care techs, respiratory therapists, intensivists and other physicians, and physical therapists. Mobilizing critical care patients could become extremely complicated since it may involve many lines, tubes, and equipment. Mobilization of a patient is also dependent on the patient's alertness or level of sedation. The team approach is extremely important for these reasons.

The theory's phase six would include conducting surveys, audits, and meetings with the stakeholders while implementing the early mobility into the workflow. It is important to assess for barriers and provide the appropriate resources needed to make this project a success. Barriers could include education, lack of team work or staff, time management, inappropriate orders, charting, patient sedation levels or condition, or not comfortable mobilizing critical patients. Currently, 82% of our patients are not receiving early mobilization according to the charting by the nurses. This project will require constant motivation and reminders to the staff so that this change can be implemented successfully into our ICU. According to Castro, Turcinovic, Platz and Law (2015), staff will need repetitive training and education for this project to be successful in the ICU. The seventh phase of Lippitt theory can start slowly at this point. It takes time to add a new intervention into the workflow, analyze and overcome the barriers, then notice a culture change within the unit.

Data Source/Literature Review

My practicum site in the ICU has been performing well in the liberation bundle, except in the early mobility portion. Strengthening the early mobility portion is an important improvement project since decreased mobility leads to decreased muscle strength, prolonged mechanical ventilation and increased ICU delirium. I performed an extensive search using the keywords: “early mobility”, “early mobility in the ICU”, “ICU Liberation”, “decrease ICU length of stay and early mobility” and “early mobility of ventilated patients” using primarily PubMed and CINAHL for my searches. I was already aware of some websites prior to this research, therefore I went straight to those sites without the search. One of those sites was for the ICU Liberation (Society of Critical Care, 2013). My search was mostly based on early ambulation of ICU patients and received an extensive list of articles with this search. There was a significant amount of research in the subject of early ambulation over the past 10 years.

The primary focus was on muscle weakness and ICU delirium of the patient in the critical care unit. According to Kress and Hall (2014), weakness is well-known to be caused by critical illness. As the survival rate of patients in the intensive care increases, the survivors with ICU-acquired weakness also increases. An evidence-based strategy should implement early mobilization and minimize the use of sedation for the ventilated patients. The reduced sedation will allow the patient to participate in early mobility and reduce muscle weakness. Muscle wasting is primarily seen in ICU patients. Rapid skeletal muscle wasting occurs during the first week in the ICU, and the severity of the muscle wasting increase in patients with multi-organ failure (Puthuchery...et al., 2013).

The mention of patient’s safety was seen frequently in these articles. Patients in the intensive care unit have the potential to have many lines, including central lines, quintons,

arterial lines, femoral lines, endotracheal tubes, nasogastric tubes, and hemodynamic monitoring lines. It has been shown that early mobility in the ICU is safe and effective and it has been associated with decreased ICU delirium and post-intensive care syndrome (Hopkins, Mitchell, Thomsen, Schafer, Link, and Brown, 2016). Another study on approximately 500 patients with invasive lines were evaluated and observed during mobility activities. They concluded that the presence of an invasive line should not be a contraindication for mobilization, (Winkelman, 2011).

An important factor that was mentioned frequently in the reviewed literature was the cost savings in addition to improved patient outcomes. The cost savings correlated with the length of stay in the ICU. Since early mobility reduces the length of stay in the ICU, the costs will also decrease. The more days a patient remains on mechanical ventilation, the costs will increase in addition to decreased positive outcomes for the patient due to complications (Dasta, McLaughlin, Mody, and Piech, 2005). A study was conducted on 900 ICU admissions with the early mobility implemented into the ICU. The actual length of stay was decreased by 22% in the ICU, thus saving the hospital approximately \$15,000,000 annually (Lord, Mayhew, Korupolu, Manthey, Friedman, Palmer, and Needham, 2013).

Timeline

According to Castro, Turcinovic, Platz, and Law (2015), staff will need repetitive training and education for this project to be successful in the ICU. I plan to start my project with an audit to determine the required staff education prior to implementing the early ambulation into the workflow.

Timeline for improving early mobility:

1. January 29 to Feb 3 – Audit current early mobility and the charting. Assess the amount of early mobility is occurring and the levels of mobility. Develop a pre-project survey to assess the staff's view on early mobility (Appendices A & B). Determine the root causes to the barriers for the early mobility (Appendix D).
2. Feb 5 – Have an education plan developed and arrange a meeting with the stakeholders involved with project.
3. Feb 12 – Spend several hours every Monday for the next two months assisting with the workflow on early mobility of patients. Observe for barriers with this project.
4. March 1 to 4- Complete a new audit on early mobility, make changes as necessary
5. March 5 – Continue to spend several hours every Monday observing and assisting with the early mobility. Evaluate knowledge gaps of the staff.
6. March 20 – Present and educate staff regarding early mobility it at the next staff meeting (Appendix F)
7. April 2 – Continue to be available one to two days a week to keep the early mobility workflow in full momentum
8. April 20-25 – Develop a post-project survey to assess the comfort level of the staff implementing early mobility into their workflow (Appendices G & H).
9. April 25-29 – Complete a final audit and produce a comparison graph showing the results before the project and after (Appendix I).
10. April 30 – Finalize and publish the results of the early mobility improvement plan

Expected Results

I will be auditing the early mobility data and potential barriers before the project, during the project, and after the project. I expect to see an increase in completed charting of the patient

mobility, which should be at 100% by the end of the project. While rounding on the unit, I have seen patient ambulating, but the charting on the patients was not consistent and completed every time. The completed charting alone should increase the percentage of patients receiving early mobility as some of these patients were counted as not receiving early mobility.

The education to the staff should help coordinate a team effort to provide early mobility for the ICU patients. They will understand the importance of this type of patient care, and hopefully remain motivated to continue to coordinate the early mobility with team members. I feel that I may experience push back by some nurses due to the amount of concern and resentment, which is present in the unit due to lack of staff. I will have to concentrate my efforts with majority of the staff that are excited about proving this care and want to improve their patient outcomes. I also have full support from the ICU intensivist, which is necessary for the appropriate orders and policies.

Nursing Relevance

Strengthening the early mobility portion of nursing care is very important for the improvement of the patient's outcome in the ICU. Decreased mobility leads to decreased muscle strength, prolonged mechanical ventilation and increased ICU delirium (Hunter, Johnson, Willis, and Coustasse, 2014). As a CNL, it is important to provide education, support, and resources for the staff to be successful in implementing something new into their workflow. The bedside nurses need to have the support from physicians and coworkers to make this project a success. According to Kalisch, Landstrom & Hinshaw (2009), patient ambulation is the most frequently missed nursing care. Therefore, understanding the barriers and providing the tools nurses need to implement early mobility should be a priority. We expect to increase the neuromuscular strength of the ICU patients in a shorter amount of time, decrease ICU delirium, and decrease the

length of stay of patients in the ICU. The overall goal is to improve patient outcomes by applying evidence-based practices within the unit.

Evaluation and Conclusions

The goal of the early mobility project was to increase early mobility of the patients to the levels of III and IV (Appendix C). This is based from the recommendations by the Society of Critical Care. Another goal was to improve the charting of the early mobility. The charting is extremely important as it is the only way to show early mobility is being conducted and assess the level of the patients. A final audit over several days was completed to analyze the current implementation of early mobility into the workflow.

In the beginning of the project, I gathered data from the facility's performance scoreboard. It listed the percentage of patients receiving early mobility every month over the past several years. At the end of the project, I used the data from the performance scoreboard and from the audits obtained throughout the past few months (Appendix I). The percentage of patients receiving early mobility last year was at an average of 18.7%. The goal was to have an increase of 50% of patients receiving early mobility by the end of this project. The average percentage of patients receiving early mobility at the beginning of the project was 23.5%. At the end of the project, the percentage of patients receiving early mobility was 37.4%. Although the goal was not achieved, there was an increase in patients receiving early mobility.

The specific levels of mobility were not tracked on the facility's performance scoreboard. This data was gathered during the audits before and after the project was completed. The goal was to have the patients receive early mobility at levels III and IV. Before the project, 18.8% of patients received levels III and IV early mobility. 18.2% of patients received levels III and IV after the project. There was a decline in patients receiving levels III and IV early mobility. One

reason for this decline could be related to the charting of early mobility. A comparison chart showed the charting of early mobility before and after the project was completed (Appendix J). It indicated that more patients were receiving levels III and IV of early mobility, but a large percentage of patients' levels was not obtained due to a lack of charting. The levels of mobility that was not charted prior to the project was 12.5%. After the project, 36% of patients did not have the level of mobility charted. The charting indicated that early mobility was performed, but the level of mobility that the patient achieved was not charted. Therefore, it was difficult to assess the success of this project.

A post project survey was conducted to assess barriers to the early mobility and the charting process (Appendix G). It indicated that majority of the staff felt more comfortable mobility critical care patients. The staff views of three main barriers for early mobility included team work / availability of staff (38.5%), comfortable mobilizing ventilated patients (15.4%), and workload / available time (23%). There was a question whether the staff received sufficient education regarding the early mobility. I also conducted personal interviews regarding the early mobility. The survey indicated sufficient education was received, but my personal interview with staff indicted otherwise. After the staff meeting presentation, and educational binder that included the same material was available within the unit. Several emails were also sent over the past few months, reminding the staff to implement the early mobility and available education regarding this implementation. In addition to the education provided, I rounded one to two times weekly to assist staff with the early mobility implementation.

It is my conclusion that additional and consistent education is required for this project to be successful. Meetings with the various stakeholders should occur more often to assess the barriers and brainstorm ideas to overcome these barriers. This project requires a culture change

within the unit, which occurs slowly over a period of time. It will require nurses in leadership roles to motivate, encourage and assist the bedside nurses, in order to provide early mobility for the patients. As the unit continues to work as a team and make the early mobility implementation a priority, this project has the potential to be successful in the unit.

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Appendices

*Appendix A**Memorial Medical Center ICU**Pre-Project Survey*

1. Please choose your role:
 - a. Physician
 - b. Advanced Nurse Practitioner
 - c. Registered Nurse
 - d. Respiratory Therapist
 - e. Physical Therapist
 - f. Occupational Therapist
 - g. Nursing Assistant / Patient Care Technician

2. Are you familiar with the term, “Early Mobility” which is part of the ICU Liberation?
 - a. Yes
 - b. No

3. How do you know about the “Early Mobility” intervention? (Examples: read article, NTI, our current ICU Liberation implementation, etc.)

Free text response:

4. How important is early mobility in the ICU to you?
 - a. Extremely important
 - b. Very important
 - c. Important
 - d. Not as important
 - e. Not sure

5. Generally, are you satisfied with the current mobility initiatives in the ICU?
 - a. Extremely satisfied
 - b. Very satisfied
 - c. Satisfied
 - d. Not satisfied
 - e. Not sure

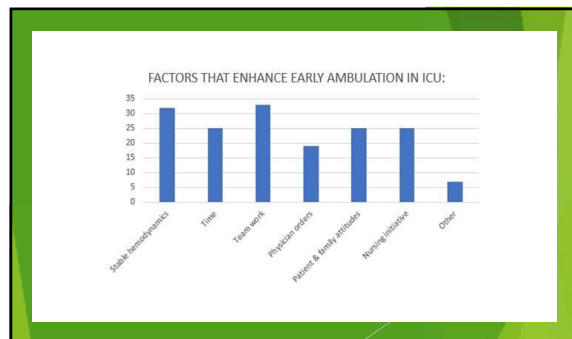
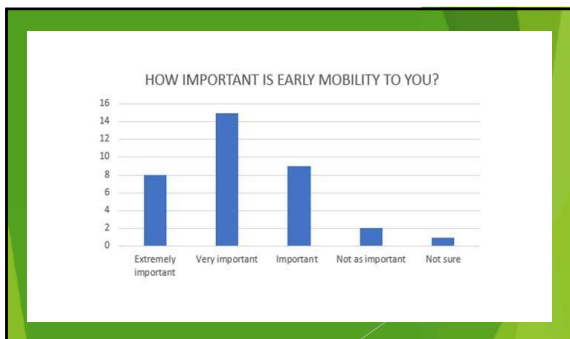
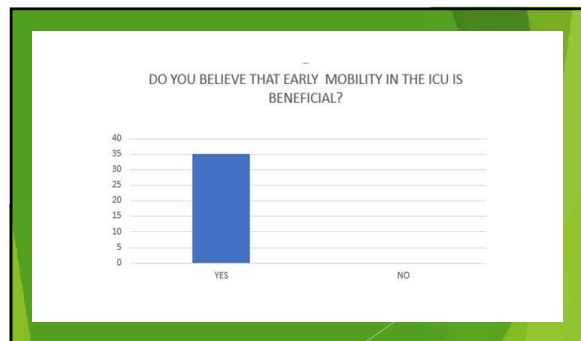
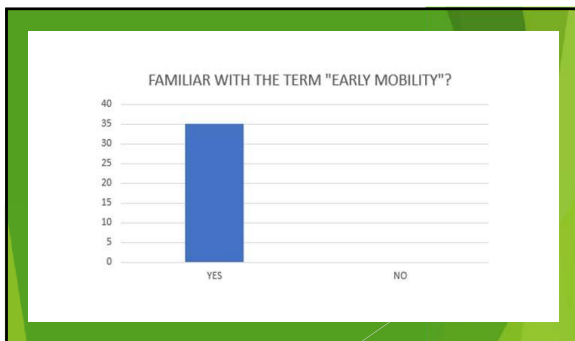
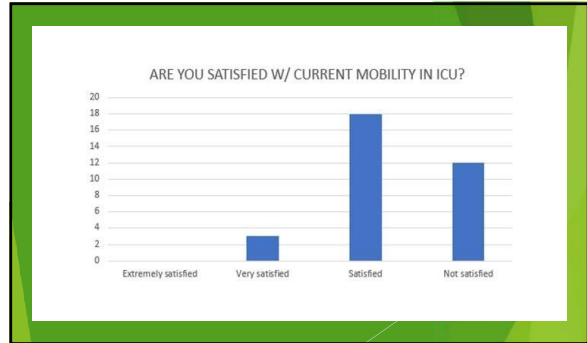
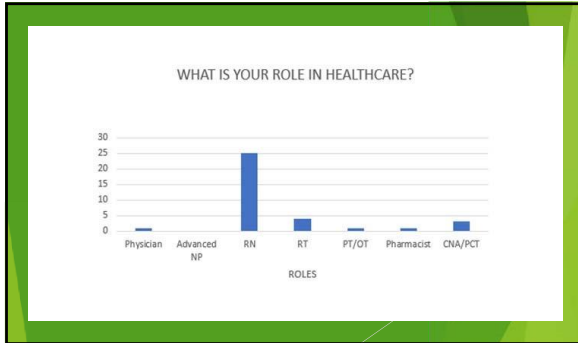
6. Do you believe that early mobilization in the ICU is beneficial to patients?
 - a. Yes
 - b. No

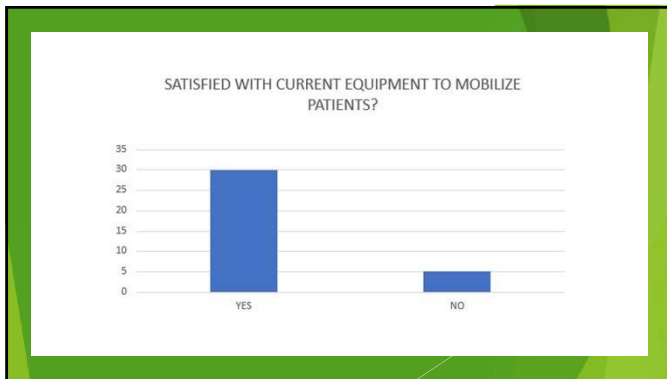
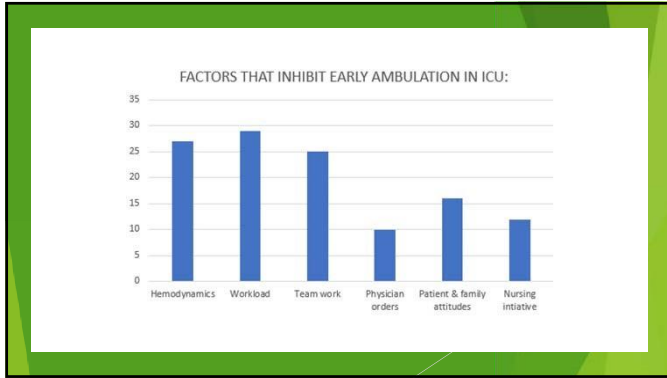
Free comment to explain answer:

7. What factors enhance early ambulation in the ICU? (Choose all that apply.)
 - a. Stable hemodynamics
 - b. Time
 - c. Team work
 - d. Physician orders
 - e. Patient and family attitudes towards mobility
 - f. Nursing initiative

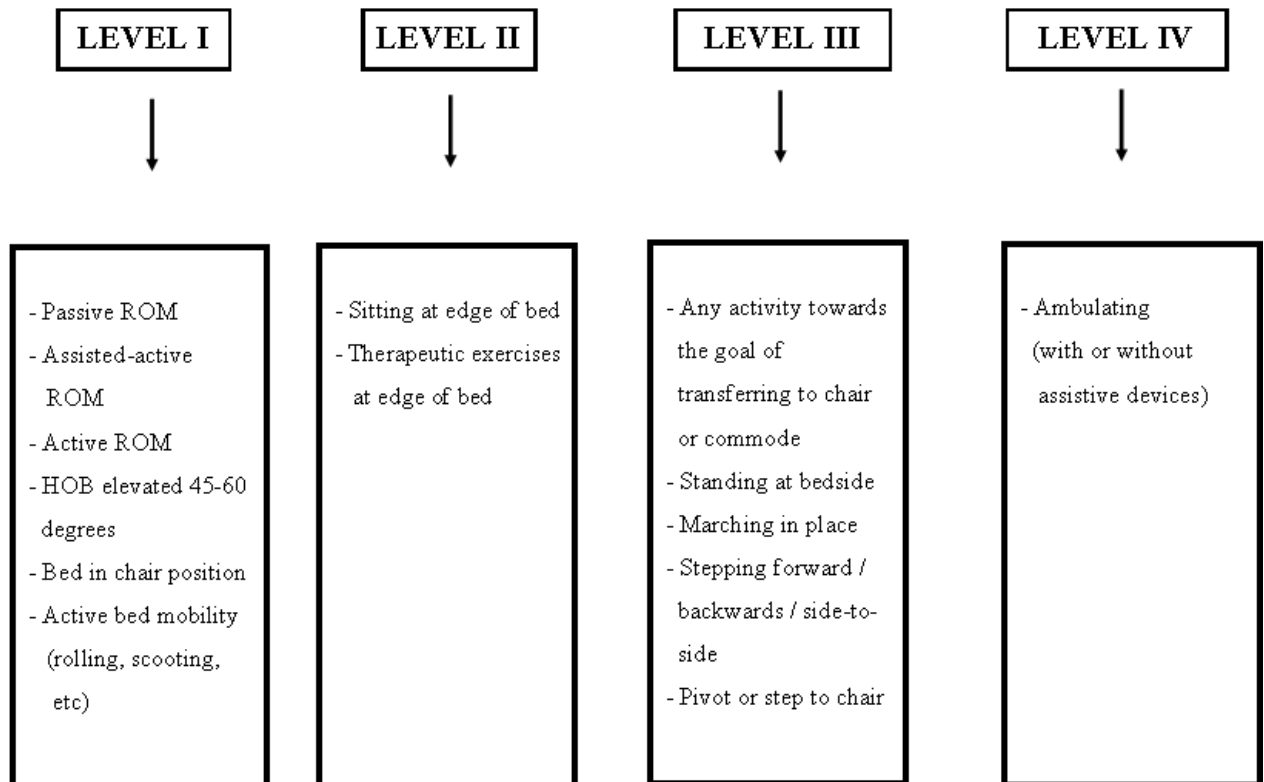
- g. Other (please specify)
- 8. What factors inhibit early ambulation in the ICU? (Choose all that apply.)
 - a. Hemodynamics
 - b. Workload
 - c. Team work
 - d. Physician orders
 - e. Patient and family attitudes towards mobility
 - f. Nursing initiative
 - g. None of the above
- 9. Are you satisfied with the equipment available for mobilizing patients in the ICU?
 - a. Yes
 - b. No
- 10. Please share general comments.
 - a. Free text response:

Appendix B



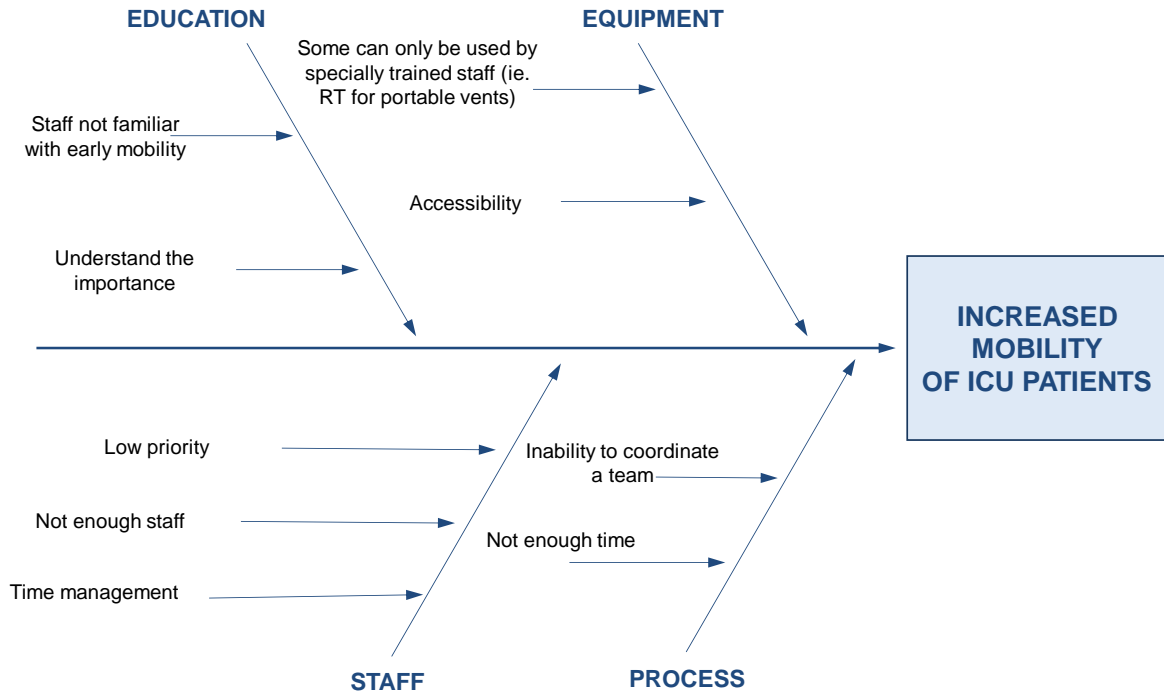


Appendix C

ICU EARLY MOBILITY LEVELS: (GOAL: Level III or IV)

Appendix D

EARLY MOBILITY OF ICU PATIENTS



Appendix E

Early Mobility Budget and Savings estimate for the Project ICU

Budget estimates

Cost (annual per patient)	Before early mobility	Maintain early mobility
Personnel	\$206,035.20	\$206,035.20
Training/Materials	\$0.00	\$500.00
Meetings	\$0.00	\$1,000.00
ICU stay (average LOS per patient)	\$32,716.80	\$28,627.20
TOTAL	\$238,752.00	\$236,162.40

Savings estimate

Savings	Before early mobility	After early mobility
Length of stay	3.2 days	2.8 days
Cost per length of stay	\$32,716.80	\$28,627.20
Cost of ICU stay according to 3000 annual admissions	\$98,150,400.00	\$85,881,600.00
Cost of personnel and training	\$206,035.20	\$207,535.20
Total savings per patient	\$0.00	\$4,089.10
Total savings per year	\$0.00	\$12,267,300.00

Appendix F

Early Mobility for ICU Patients

Presented by
Wendie Gilliam, RN
Memorial Medical Center/ICU Charge
University of San Francisco MBN/CNE student

Lesson 1: Levels of Early Mobility

ICU EARLY MOBILITY LEVELS: (GOAL: Level III or IV)

LEVEL I	LEVEL II	LEVEL III	LEVEL IV
- Patient BGM - Assisted active BGM - Active BGM - BGM elevated 45-90 degrees - Bed in chair position - Active bed mobility (rolling, swinging, etc)	- Sitting at edge of bed - Therapeutic exercises at edge of bed	- Any activity exceeds the goal of mobilizing to chair or commode - Walking at bedside - Marking in chair - Stepping forward / backward / side-to-side - Pivoting on step to chair	- Ambulating (with or without assistive device)

Why early mobility of the ICU patients (including mechanically ventilated patients)?

- REDUCE ICU DELIRIUM
- REDUCE ICU LENGTH OF STAY
- REDUCE HOSPITAL LENGTH OF STAY
- REDUCE DURATION OF MECHANICAL VENTILATION
- IMPROVE INDEPENDENT FUNCTION
- IMPROVE MUSCLE STRENGTH

Early mobility is now considered to be an evidence-based practice that is used nationwide throughout various ICUs. It has been placed into the ICU Liberation bundle due to the positive outcomes for the patients.
www.iculiberation.org

Lesson 1: Coordinate & Mobilize

- A Huddle to assess your patient's early mobility level at: 0800, 1600, and 2200
 - These times made a difference of the other suffer facility as it did not interfere with the wake/sleep cycle of the patient. This also helps decrease ICU delirium.
- Within an hour (before or after) of the above times, update the unit white board with the level of mobility your patient is able to achieve that day AND if they meet the criteria for early ambulation. (Use the legend / example to the right)

REMEMBER: This is a **TEAM** effort. If a break nurse, charge nurse, PCT, RT, PT, or MD notices that a patient is ready for early mobility...help the primary nurse initiate and coordinate a team to mobilize the patient.

Ready for early mobility?

Ready

Not Ready

Patient received early mobility for the day

Background on the Planning and Preparation:

- I personally visited another facility in the Suffer system that has implemented a successful early mobility program (up to 80% of their patients receive early mobility, compared to our 20% of patients)
 - The acuity and number of patients were very similar to our patients
 - The staffing was also similar to our staffing
 - The only difference was that their team members which consisted of 1-2 men, but they did not have overhead lifts.
 - Numerous staff members were interviewed... Most common responses:
 - The key to their success was the ability to coordinate the staff and have a central location to communicate which patients were ready for early mobility and level of mobility
 - Keep the patients at their proper sedation levels according to the orders and protocols
 - Many nurses emphasized on the significant decrease in ICU delirium after several months of implementing the early mobility
 - Don't forget to chart, and get credit for the hard work you provide for your patient!

Lesson 1: Why is early mobility important?

- Muscle wasting occurs rapidly and early during the 1st week of developing critical illness.
- Early mobility decreases length of stay, decreased VAPs and DVTs, and reduce the number of HAPUs.
- ICU delirium is associated with long-term sedation, long-term ventilation and immobility. This also leads to ICU associated neuromuscular weakness, post-intensive care syndrome, and long-term functional loss to the patient.

Polubchensky, J. JAMA. 2013;310(10):1091-1000
Calkins, E. Amer. Assoc of Crit Care Nurses. 2016; 30(6):1-6
Haskins, R. AACN Adv Crit Care. 2016; 27(2):187-203

**We need to do the right thing for our patients that will provide the best possible outcome for our patients.*

Lesson 2: Preparation and Safety of the Patient

- THE IMPORTANT QUESTION: Is this safe?
- INTERVIEW: Yes! There are certain safe goals that will be followed, but multiple studies have shown that 61% of patients experience adverse events (accidental extubation, line displacement, etc.)
 - Care, E. *Critical Care Nurse*. 2013;34(1):4
- There are exceptions and guidelines (refer to our policies):

Exclusion criteria:

RASS <2	New or ↑ vasopressor dose w/in last 2 hours
PEEP >12	New arrhythmias) requiring medications
FiO2 >80%	Receiving therapies that restrict mobility (open abd, ICP that cannot be clamped, femoral artery sheath, IABP, etc.)
New / active MI	Injuries that contraindicate mobility (unstable fractures, active bleeding, etc.)

Lesson 3: Benefits and Patient Outcomes

- According to Lord et al. (2013), the average length of stay in ICU was 5.4 days and it was reduced to 4.2 days after two years of implementing the early mobility program. Their study included approximately 900 admissions annually, over a 5 year span (2 years prior to the program, the first year implementing the program, then 2 years post-implementation).
- Respiratory failure is the most common cause of admission into the ICU and mechanical ventilation increases that length of stay (Runler, Johnson, Willis, & Coakley, 2014). Therefore, the additional daily cost of mechanical ventilation was added to the daily cost of the ICU stay.

Hunter, A., Johnson, L, Willis, W., & Coakley, A. (2014). Early mobilization in ICU patients. *Proceedings of the Business and Health Administration Association Annual Conference*, Chicago, IL.
Lord, S., Mahoney, C., Fogdoku, R., Atarthey, E., Redman, M., Palmer, J., Healdham, S. (2013). ICU early physical rehabilitation program: Iterative modeling of cost savings. *Critical Care Medicine*. 41(5):71-79

Lesson 2: Team effort provides safety

- THIS IS A TEAM EFFORT....
- Any staff member can see the centralized patient board on each side of the ICU and know which patient is ready for early mobilization and the level of mobility. Arrange a team with the primary nurse to mobilize the patient....
- Our goal is to provide Level II or above for our patients. Just helping a patient to sit on the side of the bed will help increase muscle strength and provide mobility benefits.....



Lesson 3: Benefits and Patient Outcomes


- Many survivors of critical illness have considerable functional impairment due to ICU-acquired weakness. The recovery is slow and often incomplete, especially in the elderly. This results in the patient's loss of independence and ability to return to their previous functional status and reducing their quality of life.
- Early mobility of ICU patients have reduced ICU-acquired weakness significantly, which protects the patients from its long term effects
- ICU delirium can cause a long term cognitive disability, thus decreasing the patient's quality of life.
 - Preventing ICU delirium is one of the main goals for decreasing the sedation to the appropriate levels and mobilizing patients early.

Lesson 2: Team Effort and Safety

- Patient lines and drains can be accommodated including femoral lines and CRRT lines.
 - Winkelman, C. *Critical Care Nurse*. 2011. 31(5):30-75
 - Rownsbook, C. *Amer. Journ of Crit Care*. 2014. 23(4):40-50
- The ICU relies on the culture of team work and support. Our patients would not received the best patient outcomes if we did not have a successful team collaboration and communication.
 - Estlund, M. *Critical Care Nurse*. 2016. 36(7):32-38

Lesson 3: Benefits and Patient Outcomes

Savings	Before Mobility Study	After Mobility Study
Length of Stay in ICU	5.4 days	4.2 days
Cost of length per stay	\$55,209.60	\$42,940.80
Cost of ICU stay according to 900 annual admissions	\$49,688,640.00	\$38,644,720.00
Total savings per patient	\$0.00	\$12,288.80
Total savings per year	\$0.00	\$11,041,920.00



Summary of Early Mobility of ICU Patients

- Evidence-based
- Reduce overall LOS
- Increase patient's muscle strength and prevention from developing ICU-associated neuromuscular weakness
- Reduce ICU delirium
- Increase savings to our unit = possible addition staff to assist with early mobility!!!



References

- Kress, J. & Hall, J. (2014). ICU-Acquired Weakness and Recovery from Critical Illness. *New England Journal of Medicine*; 370:1626-1635. Retrieved from: DOI: 10.1056/NEJra1209390
- Hunter, A., Johnson, L., Wells, W., & Coulasse, A. (2014). Early mobilization in ICU patients. *Proceedings of the Business and Health Administration Association Annual Conference, Chicago, IL.*
- Lord R., Mayhew C., Korupolu R., Manthey E., Friedman M., Palmer J., Needham D. (2013). ICU early physical rehabilitation programs: Financial modeling of cost savings. *Critical Care Medicine*; 41(3):71-73
- Winkelman, C. *CriticalCareNurse*, 2011, 31(5):70-73
- Brownback, C. *Amer Journ of Crit Care*, 2014, 23(4):348-351
- Pandharipande, P., Girard, T. (2013) Long term cognitive impairment after critical illness. *New England Journal of Medicine*, 369:1306-1316. Retrieved from: DOI: 10.1056/NEJMo1301372

Appendix G

*Memorial Medical Center ICU**Post-Project Survey*

1. Please choose your role:
 - a. Physician
 - b. Advanced Nurse Practitioner
 - c. Registered Nurse
 - d. Respiratory Therapist
 - e. Physical Therapist
 - f. Occupational Therapist
 - g. Nursing Assistant / Patient Care Technician
 - h. Other

2. Do you feel that the Early Mobility intervention and promotion as part of the ICU Liberation has made a positive and substantial impact in the mobility of our patients?
 - a. Strongly disagree
 - b. Disagree
 - c. Neither Agree nor disagree
 - d. Agree
 - e. Strongly agree

3. How did you learn about the early mobility intervention within the ICU?
 - a. staff meeting
 - b. email
 - c. educational binder
 - d. coworker
 - e. other:

4. Do you feel the education of the Early Mobility was sufficient, allowing staff to understand the importance of early mobility?
 - a. Strongly disagree
 - b. Disagree
 - c. Neither Agree nor disagree
 - d. Agree
 - e. Strongly agree

5. Do you feel the education regarding the documentation of the Early Mobility was sufficient, allowing staff to understand and complete this section of the bundle?
 - a. Strongly disagree
 - b. Disagree
 - c. Neither Agree nor disagree
 - d. Agree
 - e. Strongly agree

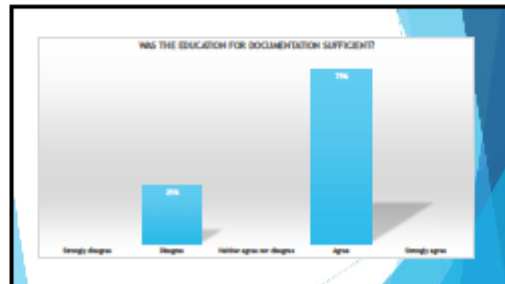
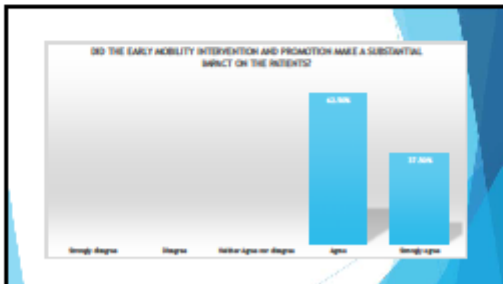
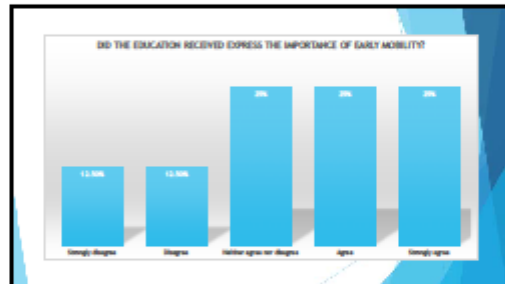
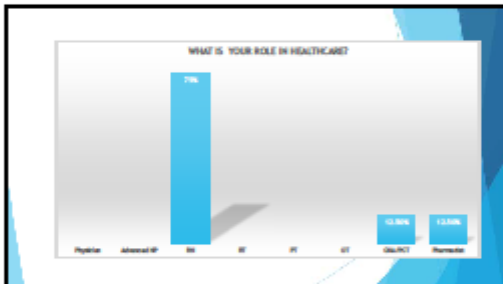
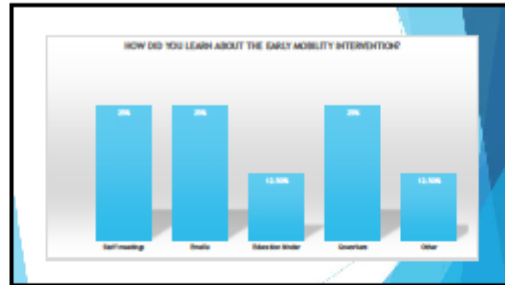
6. Generally, are you satisfied with the current mobility initiatives in the ICU?
 - a. Extremely satisfied
 - b. Very satisfied
 - c. Satisfied
 - d. Not satisfied

- e. Not sure
- 7. Do you feel more comfortable mobilizing vented and critical ICU patients now, then before the promotion of the early mobility?
 - a. Very uncomfortable
 - b. Not comfortable
 - c. Undecided
 - d. More comfortable
 - e. Very comfortable

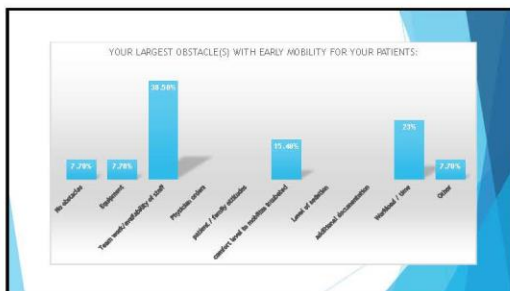
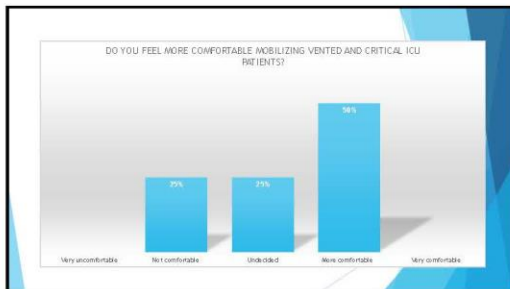
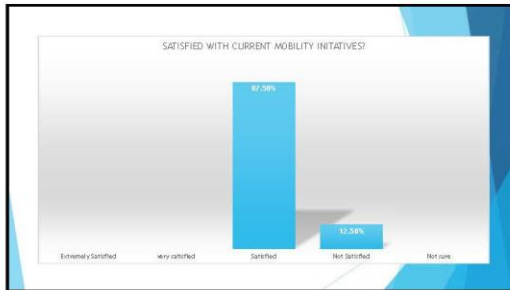
- 8. What was your largest obstacle in successfully implementing the early mobility for your patients?
 - h. There were no obstacles
 - i. Equipment (lifts, wheelchairs, walkers, etc)
 - j. Team work / availability of staff
 - k. Physician orders
 - l. Patient and family attitudes towards mobility
 - m. Comfort level to mobilize intubated and/or critical patients
 - n. Level of sedation (ie... too much, not weaned down to appropriate level, etc)
 - o. Additional documentation
 - p. Workload/time
 - q. Other:

- 9. Please share general comments.
 - b. Free text response:

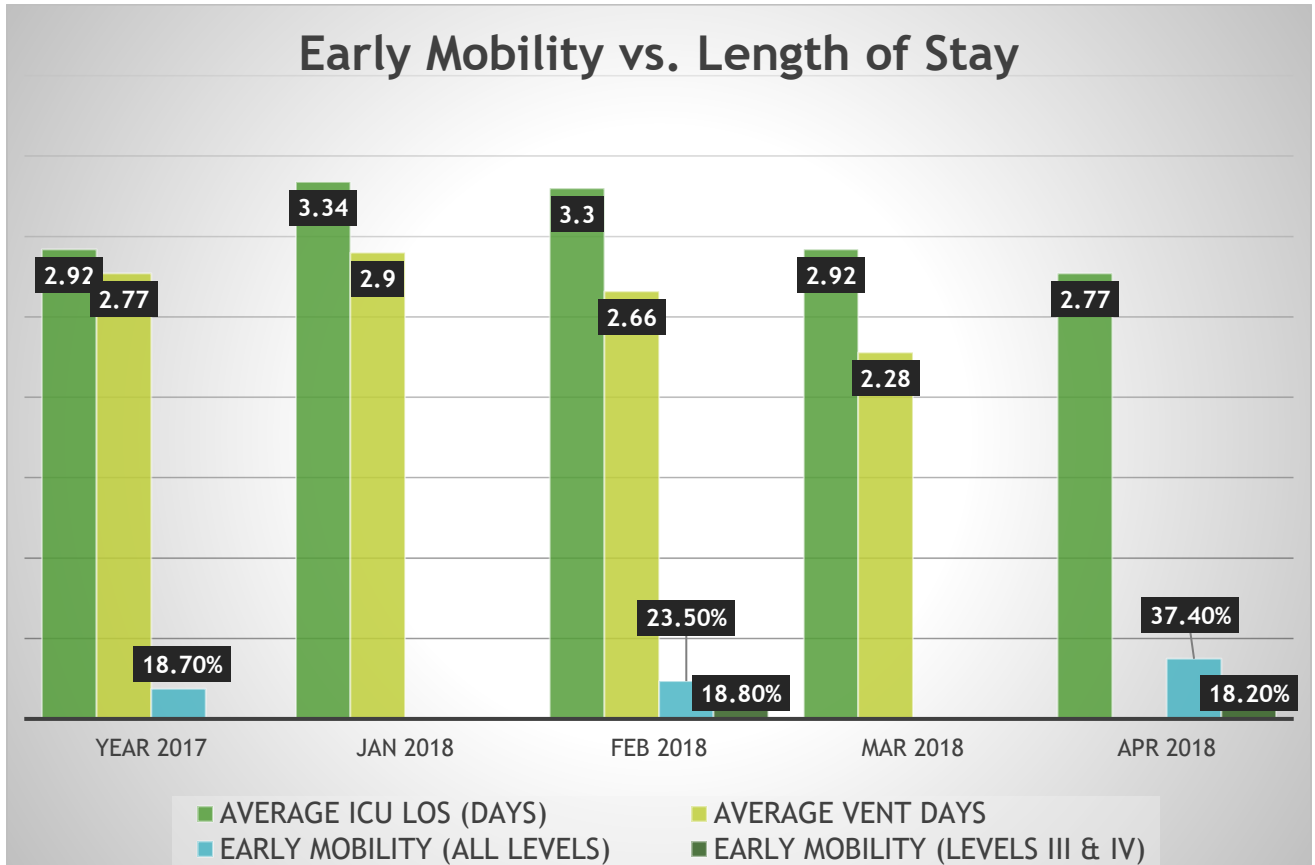
Appendix H



4/30/2018



Appendix I



Appendix J

