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Implementing a Rib Fracture Management Pathway and PIC Scoring Tool to Reduce ICU Readmissions

Susan Mastroianni

University of San Francisco, suemast22@gmail.com

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University of San Francisco
CNL Online Program
Prospectus
Summary Brief
Implementation of a Rib Fracture Management Pathway
Susan Mastroianni RN, MSNc

Specific Aim: We aim to improve the care of patients with rib fractures and or sternal fractures and reduce Intensive Care Unit (ICU) readmission rates by 20% within one year after implementing the rib fracture management (RFM) pathway.

Background: The institution is a 413 bed Level I trauma, burn, adult and pediatric center within a four state region. The microsystem encompasses general surgery patients with rib and or sternal fractures admitted to the Trauma ICU, Burn-Pediatric ICU, and acute care units.

Supportive Data: Data analysis of 559 general surgery patients admitted with rib fractures revealed there were 124 rapid response calls resulting in 36 patients readmitted to the ICU over a one year period; respiratory distress accounted for 55% of the readmissions (See Appendix A, Figure 1). The process flow chart (See Appendix B, Figure 2) highlights the current transition process from admission to ICU, discharge to acute care, and subsequent readmission back to the ICU. The Fishbone diagram (See Appendix C, Figure 3) identifies causes contributing to ICU readmissions and increased length of stays, specifically, unclear pain and respiratory management guidelines, difficulty in detecting early deterioration in blunt chest injury, and the aging population.

Microsystem Status Relative to the project: The SWOT analysis (See Appendix D, Figure 4) emphasizes considerable support for the RFM pathway. The length of stay (LOS), potential complications, and costs associated with readmission to the ICU motivated the project. The major threats are increased staff workload and lack of sustainability. Improving the transition from the ICU to acute care, reducing length of stay, costs and potential complications are clear benefits of the project.

Search Strategies: The references in this review support the use of clinical pathways, aggressive pain control, and pulmonary toilet measures in reducing ICU readmissions and LOS in patients with rib and or sternal fractures. The key search words “blunt chest injury” “rib fractures” “clinical pathways” “ICU readmissions” “factors” and “costs “ led to the following literature results ranging from 2010-2015 publications.

Databases Used: The search for evidence was completed using PubMed, CINAHL, Cochrane Collection, and Google Scholar.

Summary of Evidence: The evidence validates the need for early aggressive pain control, chest physiotherapy (Brown & Walters, 2012; Rotter et al., 2010; Simon, 2012) and clinical pathways (Rotter et al., 2010; Todd, 2006) in the care of patients with blunt chest injury. The pathway includes best practice guidelines paired with clinical expertise to reduce ICU readmissions, costs, complications and LOS.

Theoretical Direction: Meleis' Experiencing Transitions: An emerging middle-range theory, emphasizes changes in health and illnesses of individuals create a process of transitions and patients in transition tend to be more vulnerable to risks that may impact their health (Meleis et al., 2000). By viewing the discharge process from the ICU to acute care as a transition, healthcare providers are better equipped to understand the potential problems a patient may experience which may expose them to increased risk.

Stakeholders: Stakeholders included patients, families, staff nurses in acute care and ICU, respiratory therapists, and trauma-surgical and acute pain service physicians.

Business Case: From 2002 through 2009, ICU stays rose at three times the rate of the overall hospital stays without an increase in severity of illness. In addition, 31% of patients requiring an ICU stay comprise nearly 71% of total hospital costs; respiratory conditions were at the top and bottom of the list of high ICU utilization (Agency for Healthcare Research and Quality [AHRQ], 2014; Faulkery, Martin, Al Harakeh, Norcorss, & Ferguson, 2013).

It is predicted that a 20% reduction in ICU readmissions and LOS will result in \$124,458.84 savings to the institution (See Appendix E, Table 1) and provide a net benefit of \$113,631.54 over two years (See Appendix E, Table 2). The expense associated with the development and implementation of the rib fracture management pathway is nominal. Startup costs for the project, personnel and non-personnel, total \$10,827.30 over two years. (See Appendix F, Table 4). The CNL will contribute 220 hours, or \$10,560.00, towards creating and executing the protocol by May 20, 2015; saving the institution additional dollars associated with personnel expenses (See Appendix F, Table 4). The potential personnel costs incorporate time for meetings, research, data collection, analysis, staff education, and creation of a professional presentation. Additional costs for staff education will not be required as in-services will be carried out during quiet time hours on both the day shift and night shift.

Supplementing financial gains, qualitative benefits will be reaped in the form of improved staff, patient, and family engagement as well as enhanced overall inpatient Hospital Consumer Assessment and Healthcare Providers and Systems (HCAHPS) scores. Bettered HCAHPS scores will contribute to higher reimbursements through the value based purchasing program.

Methods: The creation of the RFM pathway began with approval of the project by key stakeholders followed by data collection to assist in defining the scope of the problem. Next, several meetings were held with lead team members to gain interdepartmental insight, identify processes associated with rapid response rates and ICU readmissions as well as potential benefits and threats to the project (See Appendices B, C, & D). Lastly, the protocol, educational handout, scoring tool, timeline and staff educational plan were formed.

Steps for implementation: The timeline denotes the creation of the RFM pathway began in January 2015 and will be implemented in June 2015 (See Appendix G, Figure 5). The project required collaboration between many disciplines throughout several phases. Phase one

encompassed the creation of the PIC score board and the RFM protocol, numerous meetings with key stakeholders to align objectives, and finally, the delivery of educational in-services to staff members. Phase two, execution of the protocol, will begin in June 2015 and end with an evaluation one year post implementation.

Evaluation: Evaluation methods will include data analysis of LOS, ICU readmission rates, and rapid response rates one year after the implementation of the RFM pathway. Staff, patient, and family feedback will be solicited through catalyst surveys and paper surveys. The evaluation will culminate with a statistical analysis of the benefits of a RFM pathway.

Results: Currently, actions in the timeline are up to date. Staff education has been pushed back approximately two weeks due to delayed changes in the protocol. The revised educational plan will be carried out over four weeks from May 17, 2015 through June 15, 2015 and will be implemented June 15th, 2015. Lastly, the rib fracture management pathway, acute pain service neuraxial guidelines, and PIC scoring tool will be electronically placed on an internal clinical decision support sites for quick access and reference

Outcomes: Activities on the timeline have been met as of April 26, 2015. The remaining activities are expected to be completed according to the timeline. The specific aim goals will not be realized until the second data analysis is carried out in June 2016. I am confident the rib fracture management pathway will have a positive effect on patients admitted with rib fractures and will reduce LOS, ICU readmission rates, and complications.

Recommendations: As a CNL, I recommend maintaining the timeline schedule for education, refinement, full implementation and evaluation. In addition, I will solicit feedback on the implementation process and efficacy of the protocol once an analysis of the data post implementation is obtained. Following the final evaluation, it is recommended that additional PDSA cycles be implemented based on the data if needed.

Appendix A
ICU Readmission by Trigger Type

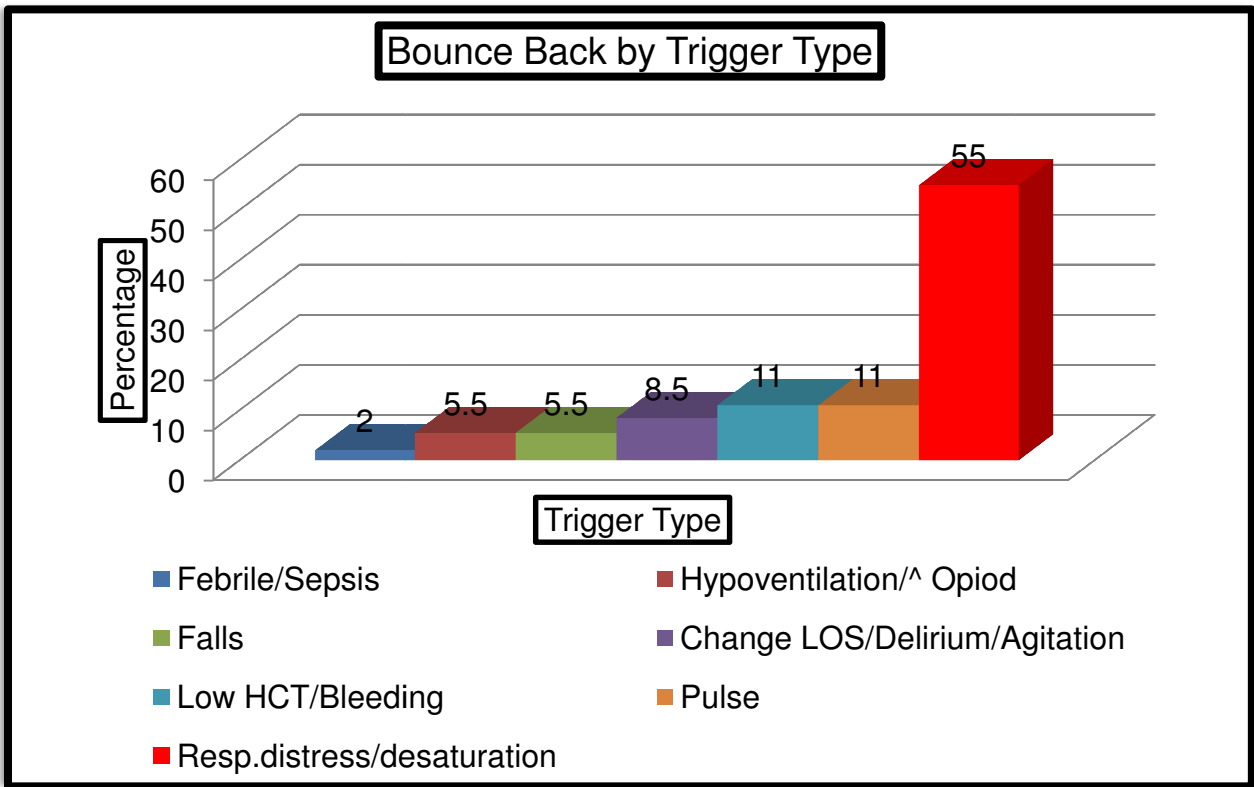


Figure 1. ICU readmissions by trigger type. This figure illustrates the causes of ICU re-admissions by percent of total occurrence. Twenty out of 36 readmissions, 55%, were respiratory in origin (Institutional data, 2015).

Appendix B
Process Flow Chart

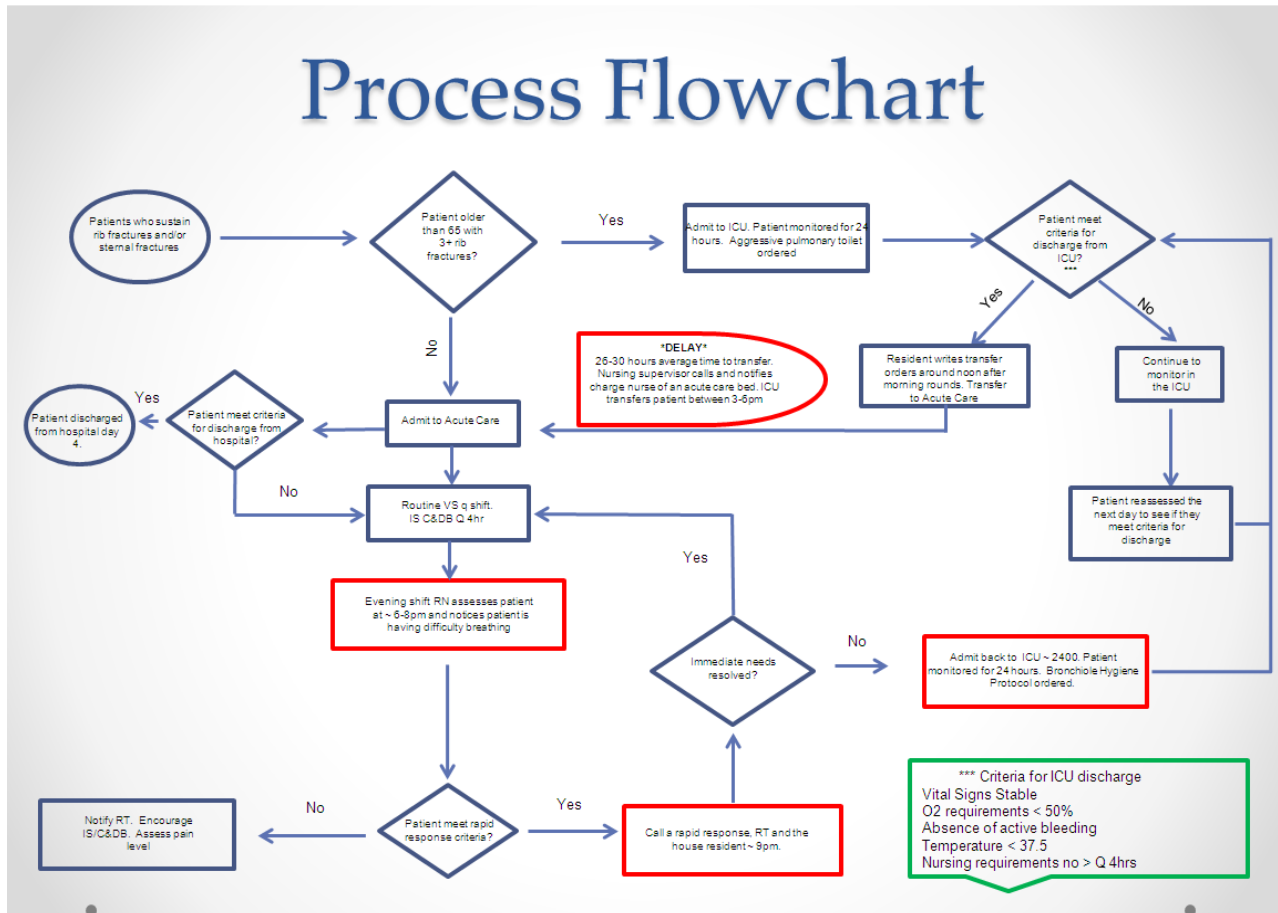


Figure 2. Process Flowchart. This figure highlights the delay in transfer to acute care, the time of day of usual transfers, and the time frame in which patients return to the ICU for respiratory distress. What this chart doesn't show are the pressures placed on physicians to reduce length of stay and transfer patients to the next level of care as soon as possible (Institutional data; Microsystem assessment, 2015).

Appendix C
Fishbone Diagram

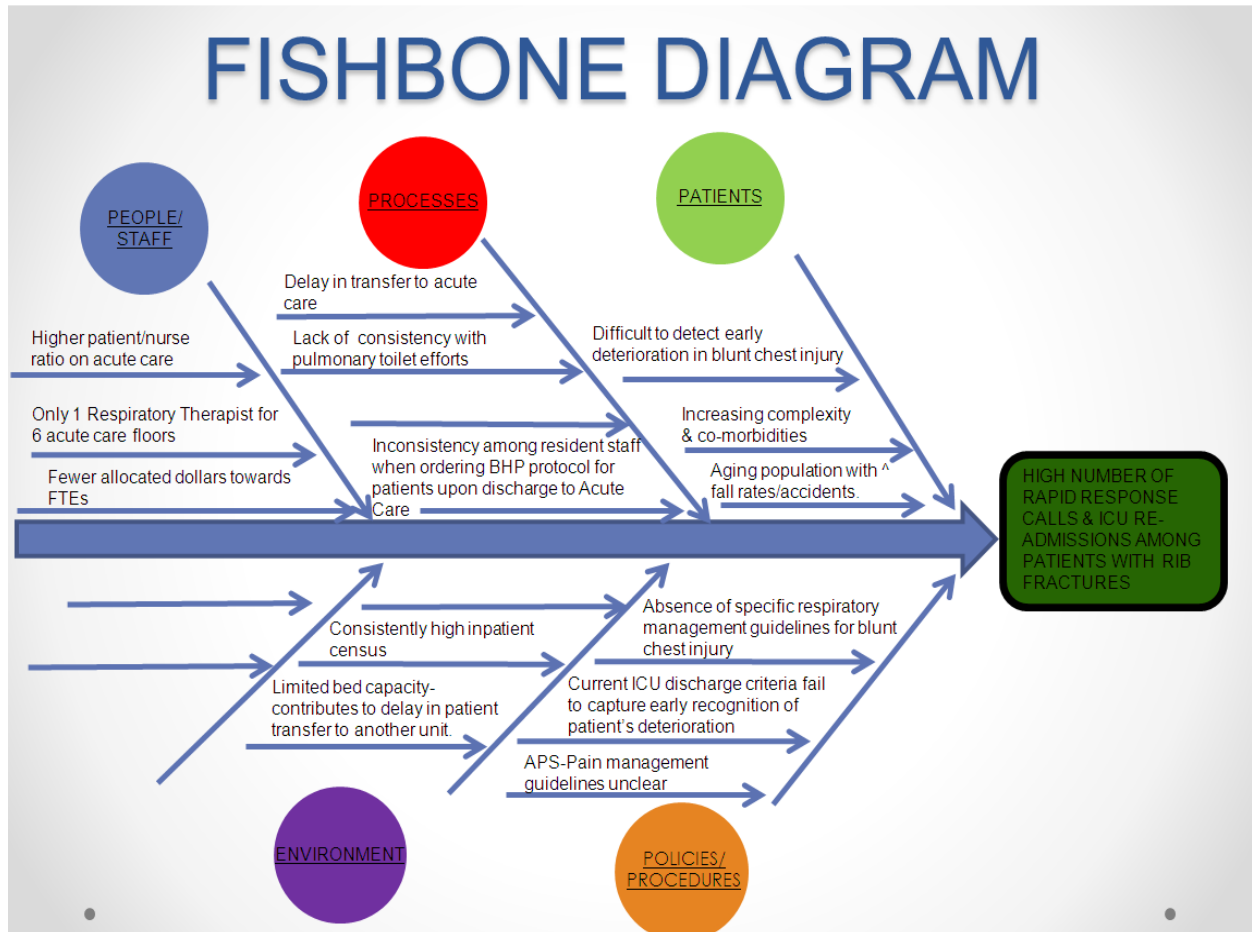


Figure 3. Fishbone diagram. This diagram depicts the potential causes contributing to the high number of rapid response calls and ICU readmissions among patients with rib fractures (Institutional data, 2015).

Appendix D
SWOT Analysis

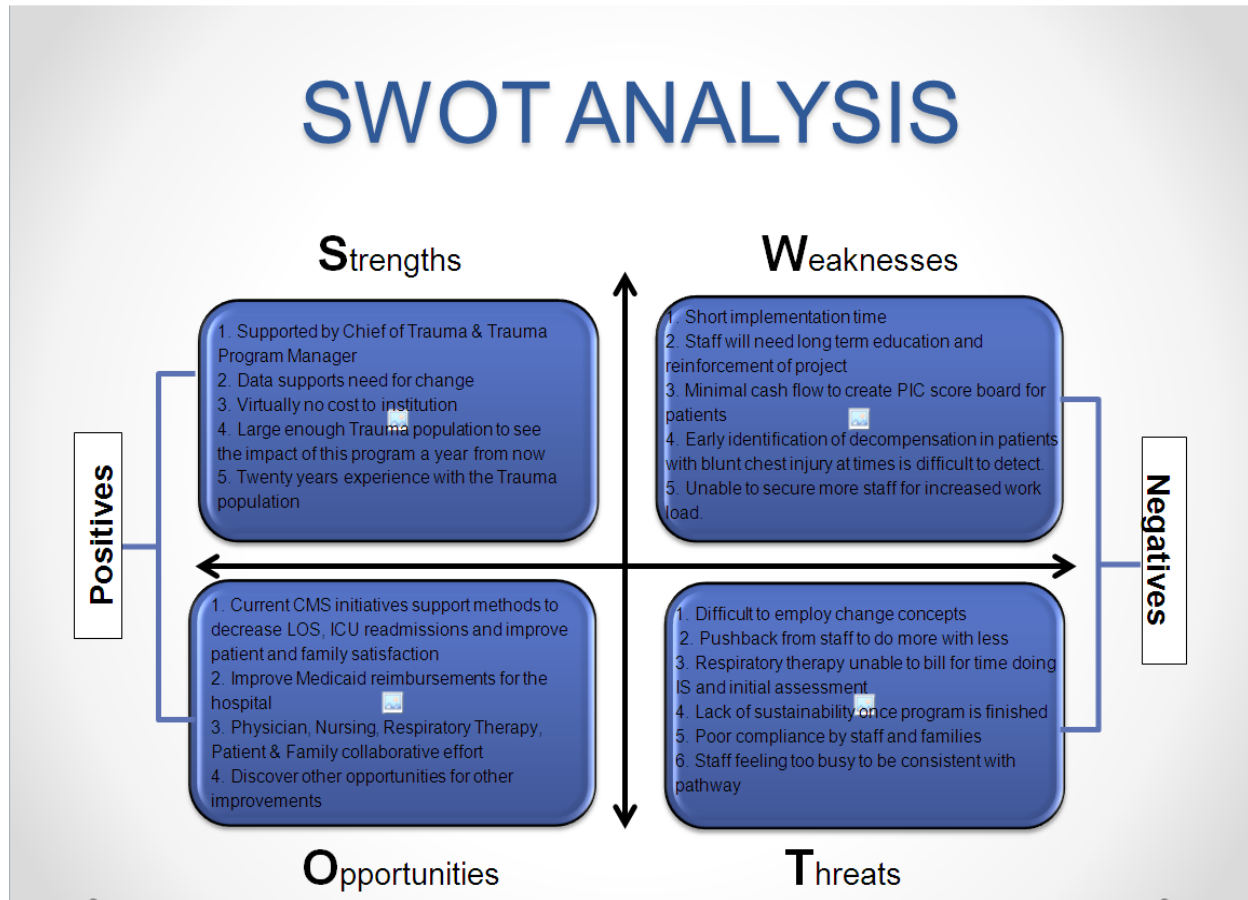


Figure 4. SWOT analysis. This figure highlights the strengths, weaknesses, threats and opportunities as well as the positives and negatives of the project (Institutional data, 2015).

Appendix E
Financial Analysis

Table 1

Institutional benefits associated with a 20% reduction in ICU readmissions

Readmissions Costs/Year	Total Costs
a. Year 2013-20 ICU readmissions due to respiratory causes. 20 patients x \$31,114.71(3 days x \$10,371.57/day)	\$622,294.20
b. June 2015-May 2016- 16 ICU readmissions due to respiratory causes = 20% reduction. 16 patients x \$31,114.71 (3days x \$10,371/day)	\$497,835.36
c. Total readmission costs for 2 years	\$1,120,129.56
d. Total savings (benefit) through a 20% reductions in ICU readmissions. <i>a-b</i>	\$124,458.84

Note. ICU readmission costs for patients with chest trauma, MS-DRG Group 185, was obtained from the Washington State Hospital Association; Hospital Pricing. The average ICU length of stay at the institution was 3 days (WSHA, 2013).

Table 2

Cost Benefit Analysis

Item	Calculation	Interpretation
a. Costs-personnel & non-personnel expenses for June 2015-May 2016 and June 2016->	\$10,827.30	Estimated two year costs for implementing the RFM pathway <i>(Appendix F, Table 2, row G annual)</i>
b. Benefits	\$124,458.84/2 years	Dollars saved by reducing ICU readmissions by 20% in the second year.
c. Net Benefits (<i>b-a</i>)	\$113,631.54/2 years	Potential dollars saved by reducing ICU readmissions by 20% through the use of a RFM pathway
d. Benefit/Cost-(B/C) ratio (<i>b/a</i>)	\$1.09	For every \$1 spent on the RFM pathway, there is a savings of \$1.09.

Note. Benefit amount is the difference between 20 ICU readmissions per year and 16 ICU re-admissions per year, a 20% reduction, based on an average length of stay of 3 days at \$10,371.57 per day (Appendix E, Table 1, row d).

Appendix F
Special Purpose Budget for Reducing Costs
And Improving Outcomes

Table 3

Special purpose budget with non-personnel expenses

Non-personnel expenses	June 2015-May 2016 (50 PIC score boards)	June 2016-> (10 PIC score boards)
d. Printing and laminating of PIC score board (1 board= \$4.38)	\$219.00	\$48.30
e. Total non-personnel expenses	\$219.00	\$48.30
f. Total non-personnel (Year 1 + Year 2)	\$267.30	

Note. The fiscal year costs for 2016 were estimated based on the assumption this protocol would indeed be successful, therefore, additional PIC scoring boards and education time would be required to expand protocol. Total costs for implementing the pathway over 2 years \$267.30.

Table 4

Special purpose budget with personnel and non-personnel expenses

	(June 2015-May 2016)		(June 2016->)	
	Annual Cost	Monthly Cost	Annual Cost	Monthly Cost
Personnel expenses				
a. Policy creation (using current staff hourly wage-\$44.00/hour at 160 hours)	\$7040.00	\$586.66		
b. Policy revision-(10 hours-2016)			\$440.00	\$36.83
c. Policy education (using current staff hourly wage-\$44.00/hour at 60 hours)	\$2640.00	\$220.00		
d. Additional staff education-(10 hours-2016)			\$440.00	\$36.83
d. Total personnel expenses (a+c)-year 1; (b+d) year 2	\$9680.00	\$806.66	\$880.00	\$73.66
Non-personnel expenses	(June 2015-May 2016) 50 PIC score boards		(June 2016->) 10 PIC score boards	
e. Printing and laminating of PIC score board (1 board= \$4.38)	\$219.00	\$18.25	\$48.30	\$4.02
f. Total non-personnel expenses	\$219.00	\$18.25	\$48.30 \$4.02	
g. Total personnel + non-personnel expenses (d+f)	\$9899.00	\$824.91	\$928.30 \$77.36	

Note. The CNL student's current hourly wage was used to calculate the personnel expenses associated with the project and could be donated to create and implement the pathway.

Appendix G
 Timeline for the Implementation
 Of the Rib Fracture Management Pathway

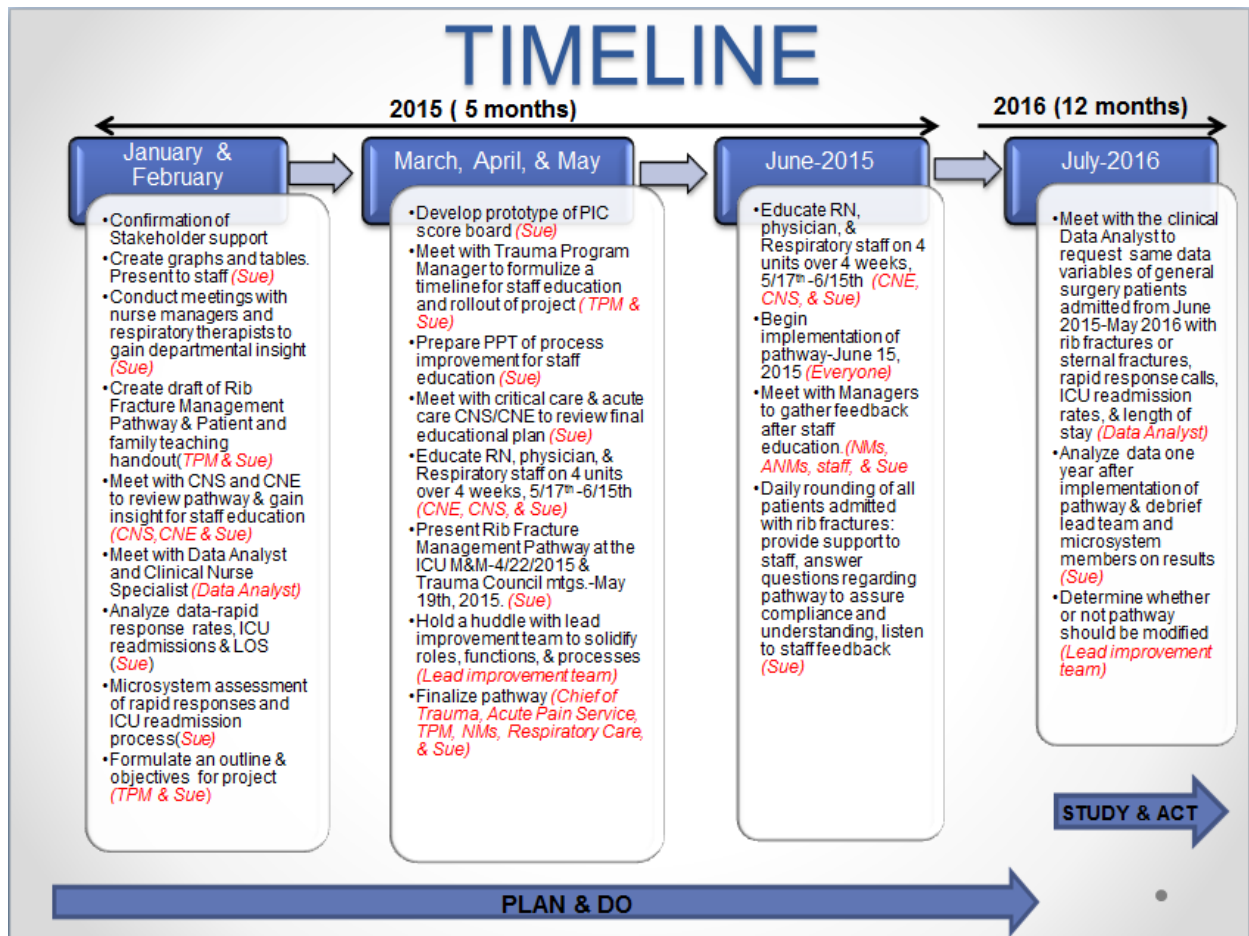


Figure 5. Timeline for the implementation of the Rib Fracture Management Pathway. This figure highlights a two phase, one and a half yearlong plan to institute a protocol to reduce length of stay, costs, and ICU readmission rates among patients with blunt chest injury. Black denotes the action taken and red denotes the team member responsible (Institutional data & Microsystem assessment, 2015).

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