

Hospital Quality Institute Vanguard Award 2016 Application

Sutter Health : ICU Liberation

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Title: (New title per Mary Anne's request on 10/24/16:

ICU Liberation: Implementing PAD Guidelines via the ABCDEF Bundle at 7 California Community Hospitals

Areas of Focus: Quality Improvement and Patient Safety

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On behalf of the Sutter Health system I am honored to support this submission for the Hospital Quality Institute Vanguard Award 2016. Sutter Health - Sacramento Sierra Region successfully implemented ICU Liberation (the ABCDEF clinical patient care bundle) in one intensive care unit in each of seven regional hospitals. This bundle is the Awakening and Breathing Coordination, Delirium monitoring/management, Early exercise/mobility, Family/patient engagement/empowerment bundle for care of all ICU patients. Participating hospitals adopted evidence-based care changes using a novel interprofessional team model as the platform for

transforming both clinical care as well as inter-disciplinary communication and cooperation. Our results show substantial ability of our organization to leverage best practices across a complex collection of acute care hospitals ultimately saving lives and delivering cost effective health care.

In addition to being able to demonstrate sustainable results across the initial participating hospitals, our ICU Liberation subject matter experts are working to disseminate the evidence based practices across our entire Sutter Health system.

An abstract describing the results of this quality improvement project was presented at the Society of Critical Care Medicine Congress in earlier this year and received the Star Researcher Top Award. We believe that receipt of the HQI Vanguard Award 2016 would appropriately recognize the improvements in high reliability care related to the implementation of this complex, multi-disciplinary project. This work transformed ICU patient care at Sutter Health and significantly contributed to improvements in intensive care practices across the country. We hope you find our results of interest and worthy of the HQI Vanguard Award 2016.

Executive Summary

Title: ICU Liberation: Improving Hospital Survival and Reducing Brain Dysfunction at 7 California Community Hospitals

Seven Sutter Health community hospitals implemented the ABCDEF bundle (Assess, prevent, and manage pain; Both SATs and SBTs; Choice of Sedation/Analgesia; Delirium monitoring; Early mobility; and Family engagement) for the ICU. This is an evidence-based strategy to implement the SCCM's Pain, Agitation and Delirium guidelines.

Improvements included reduction in: length of ventilator days and percentage of patients who were on mechanical ventilation (MV) for more than 7 days, overall levels of sedation, post-discharge mortality, and cost per case. Statistical analysis was performed (CY 2014, >6,000 patients) for hospital survival and delirium and coma-free days. For every 10% increase in total bundle compliance, patients had a 7% higher likelihood of hospital survival (OR 1.07, 95% CI 1.04 – 1.11, $p < 0.001$). For every 10% increase in partial bundle compliance, patients had a 15% higher survival to hospital discharge (OR 1.15, 95% CI 1.09 – 1.22, $p < 0.001$). Patients experienced more days alive and free of delirium and coma with increases in total (IRR 1.02, 95% CI 1.01-1.04, $p = 0.004$) and partial bundle compliance (IRR 1.15, 95% CI 1.09-1.22, $p < 0.001$).

The ABCDEF bundle was successfully implemented in 7 community hospital ICUs. Higher bundle compliance was associated with improved survival and more delirium and coma-free days.

Title: ICU Liberation: Improving Hospital Survival and Reducing Brain Dysfunction at 7 California Community Hospitals

Background and relevance:

Advances in critical care have resulted in increased numbers of patients that survive critical illness which in turn has led to the identification of physical, cognitive and behavioral sequelae that occur as a result of an ICU stay. Literature demonstrating these iatrogenic sequelae is robust. Post-Intensive Care Syndrome or PICS, is now a recognized phenomenon that occurs in many ICU survivors and these adverse effects of critical care that occur in many patients can lead to prolonged, or even life-long disability. The project described in this application was an effort to improve the quality of care provided to patients in the ICUs of 7 community hospitals by implementing the ABCDEF bundle (Assess, prevent, and manage pain; Both SATs and SBTs; Choice of Sedation/Analgesia; Delirium monitoring and management; Early mobility and exercise; and Family engagement and empowerment) for the ICU. This bundle was developed as an evidence-based strategy to implement the Society of Critical Care Medicine's (SCCM) Pain, Agitation and Delirium guidelines. Sutter Health began this work in 2013 and had rolled out to all 7 ICUs by December. This quality improvement project was funded in part by the Gordon and Betty Moore Foundation.

Methods: The approach to this QI project was unique for this health system. The clinical education and evidence-based practice changes were implemented on a platform of an Interprofessional Team (IPT) model. Interprofessional teams were comprised of a bedside RN, a nurse manager or clinical specialist/educator, a physician, rehabilitation therapist, a pharmacist and a respiratory care practitioner. Teams learned principles of collaboration, cooperation and coordination through an evidence-based, innovative curriculum specifically designed around the ABCDEF bundle. They led change in each of their ICUs using tests of change, mentoring and influence. They partnered at the bedside, during daily ICU rounds, and in meetings. Principles of shared decision making replaced hierarchical structures. Each team met with clinical and/or leadership subject matter experts for 12-two hour sessions. After this initial training, teams met to create tools, tests of change and to evaluate their units' performance. Scheduling, particularly for physicians, was difficult, but schedules were cleared and priorities were set. Influencing

practice changes was also difficult. Patients in general were less sedated and more interactive; this was a challenge for many physicians and nurses alike, especially on the night shift.

Results: Bundle compliance was measured for each of the individual ABCDEF components as well as for total or ‘all-or-none’ compliance. Individual and total compliance was remarkably high across all 7 sites – by the end of 2013 and throughout 2014 the compliance was at or above goal of 90%. The practices of light sedation, coordinating awakening trials with breathing trials, monitoring and mitigating delirium, mobilizing patients and empowering families were commonplace.

Significance: Many improvements in patient outcomes were realized. Overall length of ventilator days decreased as well as the percentage of patients who were on mechanical ventilation (MV) for more than 7 days. Use of benzodiazepines for sedation was dramatically decreased, as were overall levels of sedation. Six month post-discharge survival increased. Returns on investment (ROI) analyses were favorable at most sites. We chose to perform statistical analysis of two specific outcomes: hospital survival and days patients spent in the ICU free of delirium and coma. The analysis revealed that for every 10% increase in total bundle compliance, patients had a 7% higher likelihood of hospital survival (OR 1.07, 95% CI 1.04 – 1.11, $p < 0.001$). For every 10% increase in partial bundle compliance, patients had a 15% higher survival to hospital discharge (OR 1.15, 95% CI 1.09 – 1.22, $p < 0.001$). Patients experienced more days alive and free of delirium and coma with increases in total bundle compliance (IRR 1.02, 95% CI 1.01-1.04, $p = 0.004$) and increases in partial bundle compliance (IRR 1.15, 95% CI 1.09-1.22, $p < 0.001$).

Sustainability and scaling: As with many QI projects, sustainability was a challenge. Bundle compliance remained $> 80\%$ in most instances. In 2015 teams at each of the original 7 hospital ICUs were brought together to identify opportunities for refocus and refinement. Reinvigoration was successful, and performance data continue to demonstrate adherence to the new practices. In late 2015, the Gordon and Betty Moore Foundation provided a dissemination grant that allowed these successful evidence-based improvements to be spread to the other 15 acute care Sutter Health hospitals. IPTs were formed for each ICU, and IPT and clinical training sessions began in the spring of 2016. Bundle performance data are collected for each affiliate by 2 electronic ICU

(eICU) hubs; one located in San Francisco and the other in Sacramento. E-RNs attend rounds virtually to drive evidence-based care and perform chart abstraction from the EMR. Performance reports and outcomes data are provided to each hospital ICU on a monthly basis in order to drive continuous quality improvement. Subject-matter experts (SME) from the original pilot hospitals have joined project leaders from the additional sites to form a system-wide ICU Liberation Subject Matter Expert Leadership Team (ICU L SMELT) whose task is to continuously review literature and to revise policies, practices, recommendations and order sets as new evidence becomes available.

Achievements: There are several notable achievements related to this QI initiative. Effectively implementing a large scale change to longstanding ICU practices is, in and of itself, remarkable. Introducing practice guidelines based on randomized controlled trials conducted at large, academic medical centers into a community hospital setting is fraught with challenges. In the case of the PAD guidelines, it had never been done. The creations of unit-based teams provided the platform for success. The level of bundle compliance and the scope of improved outcomes were notable. Finally, and perhaps most importantly, the success achieved in these 7 community hospitals has informed much of what is now the SCCM ICU Liberation Collaborative that is spreading the work across the country for both adult and pediatric ICUs.

Key lessons learned: The resources provided by the Gordon and Betty Moore Foundation were obviously key. Notably, the majority of the funds were used for program and curriculum development, support staff and communication. Physician participation in IPT sessions and meetings were funded; all other staff participation at the hospitals was paid in-kind. The take home message is that as a result of this work, and with the resources available from the SCCM ICU Liberation Taskforce and collaborative, teams at any site could take on this work without outside funding. ROI can be projected and demonstrated. Invested physician leads are key, and these individuals need to be willing and able to influence the practice of peers. The IPT model, the platform for shared decision making, and increased collaboration among ICU teams, demonstrated anecdotal improvements in job satisfaction among all participants. Implementation of this care improvement would have been extremely challenging without the IPT approach.