Incorporation of LEAN-Six Sigma Training into QI Curriculum

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UF | UNIVERSITY of FLORIDA

The Foundation for The Gator Nation

Team Members

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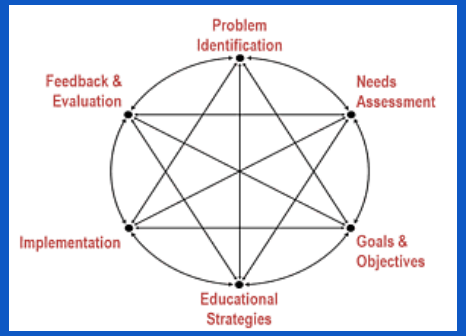
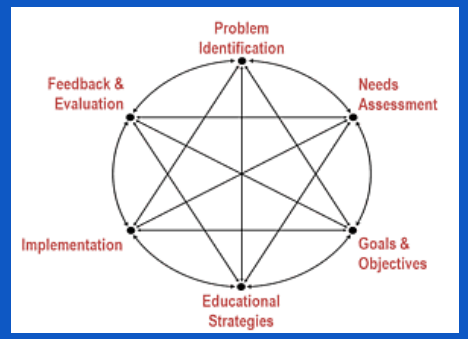


Problem / General Needs

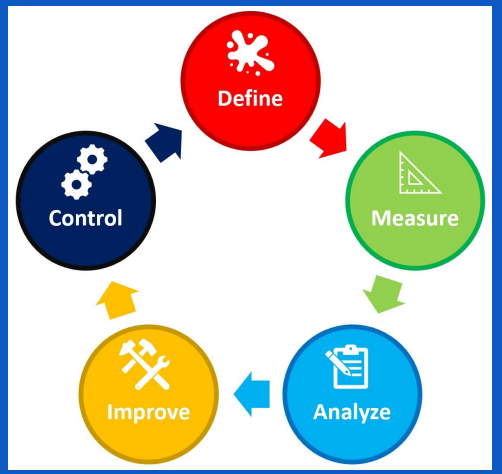
Anesthesiology ACGME Program Requirements for residents:

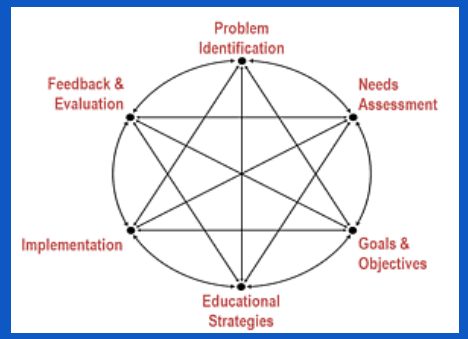
- systematically analyze practice using quality improvement methods and implement changes with the goal of practice improvement
- work in interprofessional teams to enhance patient safety and improve patient care quality
- participate in identifying system errors and implement potential systems solutions
- incorporate considerations of value, cost awareness, delivery and payment, and risk-benefit analysis in patient care
- must complete a scholarly project that is at least presented at a local conference.



Targeted Needs

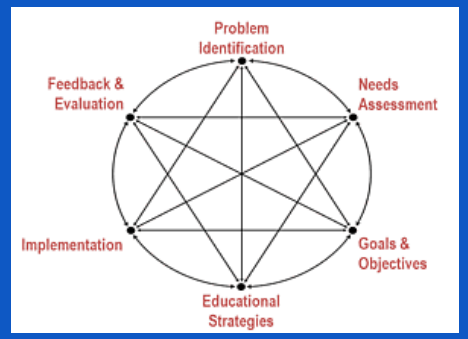
- UF-Jax Residents:
  - Anesthesiology residents were completing a QI projects, but their methodology and use of data for rounds of PDSA cycles was weak.
  - Only one lecture on value in healthcare was included in our curriculum.
  - Residents struggled on QI OSCE station in practice Board OSCE exam.
    - They could not describe all QI steps (DMAIC)





Goals & Objectives

- Goal: To meet ACGME requirements
- Objectives: Each resident will….
  - Identify a system error or inefficiency
  - Analyze the system issue with robust methodology
  - Work with other professionals to identify and implement a system change
  - Evaluate effectiveness of the system change and establish processes to ensure continuation
  - Present project at UF-Jax Celebration of Resident / Fellow Education & Research Day

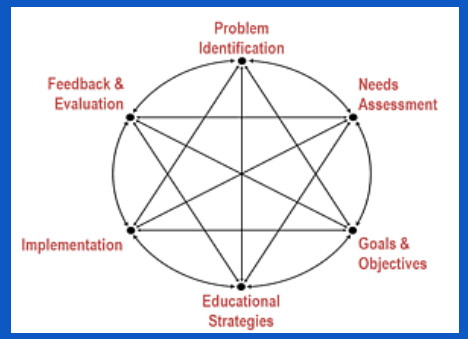


Educational Strategies

- Incorporated our senior anesthesia residents into the Yellow Belt LEAN-Six Sigma course taught by the UF-Jax QI department (started in Spring 2019).
- Course teaches LEAN and Six Sigma principles, including a variety of assessment tools, in 4 days of classes spread over 3 months and requires completion of an interprofessional capstone project and final local presentation.

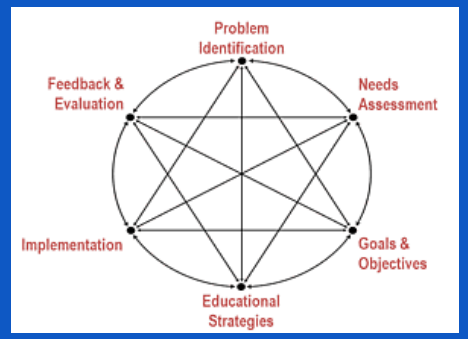
Lean Six Sigma Course

- Students: Physicians, residents, nurses, therapists, technicians, billing staff, clerical staff, safety staff, and HR staff.
- UF Health Jacksonville Lean Six Sigma Yellow Belt Certificate shows that the student has knowledge and practical skills needed:
  - To define a problem
  - To map a process
  - To use data to measure the current performance of that process
  - To analyze the data to identify the root cause of the problem
  - To implement effective solutions
  - To control the process to make sure that the fix stays in place



Implementation

- PGY3 and PGY4 anesthesiology residents completed the Winter 2020 Yellow Belt LEAN-Six Sigma course with other healthcare professionals from January 2020 through April 2020
- PGY3 and PGY4 resident were paired on capstone projects to allow for continued QI cycles to proceed beyond June 2020 graduation dates.
- All residents were relieved of clinical duties for each day of classes for the course.
- As part of our usual academic schedule, the anesthesiology residents have 2 afternoons per month dedicated to open academic time to study and work on projects



Evaluation

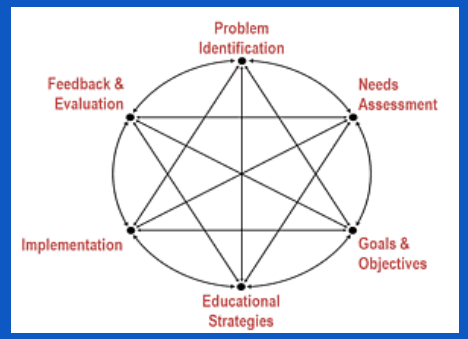
- All residents passed the course, including posttests of knowledge and completion of capstone projects; each receiving Yellow Belt Certification in LEAN-Six Sigma.
- All residents easily passed QI station at Practice OSCE.
- All projects were delayed in completing final data collection and analysis even though residents worked less in the operating rooms during Spring 2020 due to the COVID pandemic.
- Feedback from residents was highly positive, but recommended incorporating more time between classes to work on the capstone projects.

2020 Quality Poster Exhibition

Best Display of Lean Six Sigma Methodology

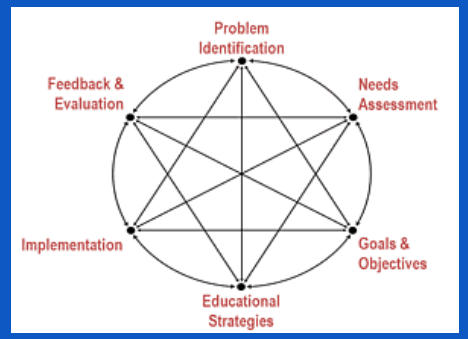
Perioperative Hyperglycemia: Development of a Treatment Protocol

David McEnerney, DO & Kaitlin Kamrowski, DO



Continued Improvement

- Realizing that the time allotted to complete the capstone projects was too short for residents, we redesigned the curriculum to occur over 9 months (August to April) for the 2020-2021 academic year.
- PGY3 residents participated with other healthcare professionals in this extended course.
- Didactics on poster development and oral presentations were added to curriculum.



Feedback on Year 2

- All residents passed the course and completed capstone projects; each receiving Yellow Belt Certification in LEAN-Six Sigma.
- Feedback from the residents was highly positive.
- All projects had full QI cycles completed, including final data collection during the time period of the course.

- Involvement of faculty in projects combined with recognition of the quality of projects completed by our residents has sparked interest in QI/PS by our anesthesiology faculty.
- To date, six anesthesiology faculty and staff have now also completed the Yellow Belt LEAN-Six Sigma course. This is nearly 20% of our faculty.

QI Division Winner at UF-Jax Celebration of Resident / Fellow Education & Research Day

UF UNIVERSITY of FLORIDA College of Medicine Jacksonville

Implementation of cesarean section kit improves time from decision on urgent cesarean delivery to skin incision

ANESTHESIOLOGY PERIOPERATIVE CARE VIGILANCE

DEFINE | MEASURE | ANALYZE | IMPROVE | CONTROL

Problem Statement

The time required to initiate urgent cesarean section takes longer than standard (30 minutes), which can lead to adverse maternal and fetal outcomes.

Goal Statement

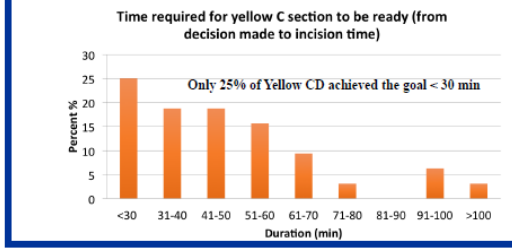
The Goal is to increase the percent of urgent C-sections that meet the goal of less than 30 minutes from decision to incision time from 25% to 35% by June 30, 2021.

Business Rationale

Decreased time from call for urgent C section to incision time will improve maternal and fetal outcomes and safety.

DEFINE | MEASURE | ANALYZE | IMPROVE | CONTROL

Baseline Measures

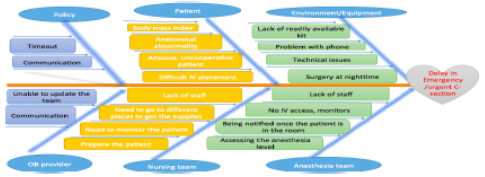


Team

Project Champion:	Dr. Diachun
Process Owner:	Dr. Abushora, Dr. Damalanka, Dr. Manatpon
Team Lead:	Dr.Vanderhoef
Team Members: Dr. Vanderhoef, Dr. Braunecker, Dr. Abushora, Dr. Damalanka, Dr. Manatpon, Amanda, L&D nursing staff(Ms.Shade),Equipment person,Pharmacy team.	

DEFINE | MEASURE | ANALYZE | IMPROVE | CONTROL

Root Causes



DEFINE | MEASURE | ANALYZE | IMPROVE | CONTROL

Solutions Implemented

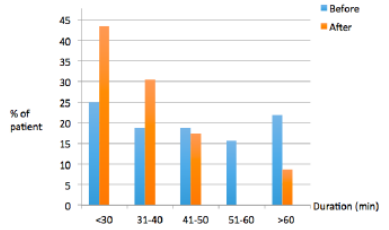
- We created C section kit including all the things need to be collected by the nurse and kept it one bucket and known place.
- Additionally, the cesarean section virtual kit was created in the drug dispensing machine (OmniCell), which allows dispensing all medications at the same time without a need to obtain each medication separately. All medications in virtual kit are also stored in the same cabinet in order to be acquired efficiently.

DEFINE | MEASURE | ANALYZE | IMPROVE | CONTROL

Project Results

We identified 23 patients receiving urgent cesarean section between February-May 2021. The average time required from decision on urgent cesarean delivery to skin incision was 35 minutes compared to 47 minutes prior to the implementation. The percent of urgent C-sections that met the goal of less than 30 minutes was increased from 25% to 43%. 6 people responded to the survey (3 LD nurses, 2 CRNA, and 1 anesthesia resident). 83.33% of respondents agreed that virtual kit in the drug dispensing machine (Omnicell) and cesarean section kit are helpful and ease of use.

Improvements

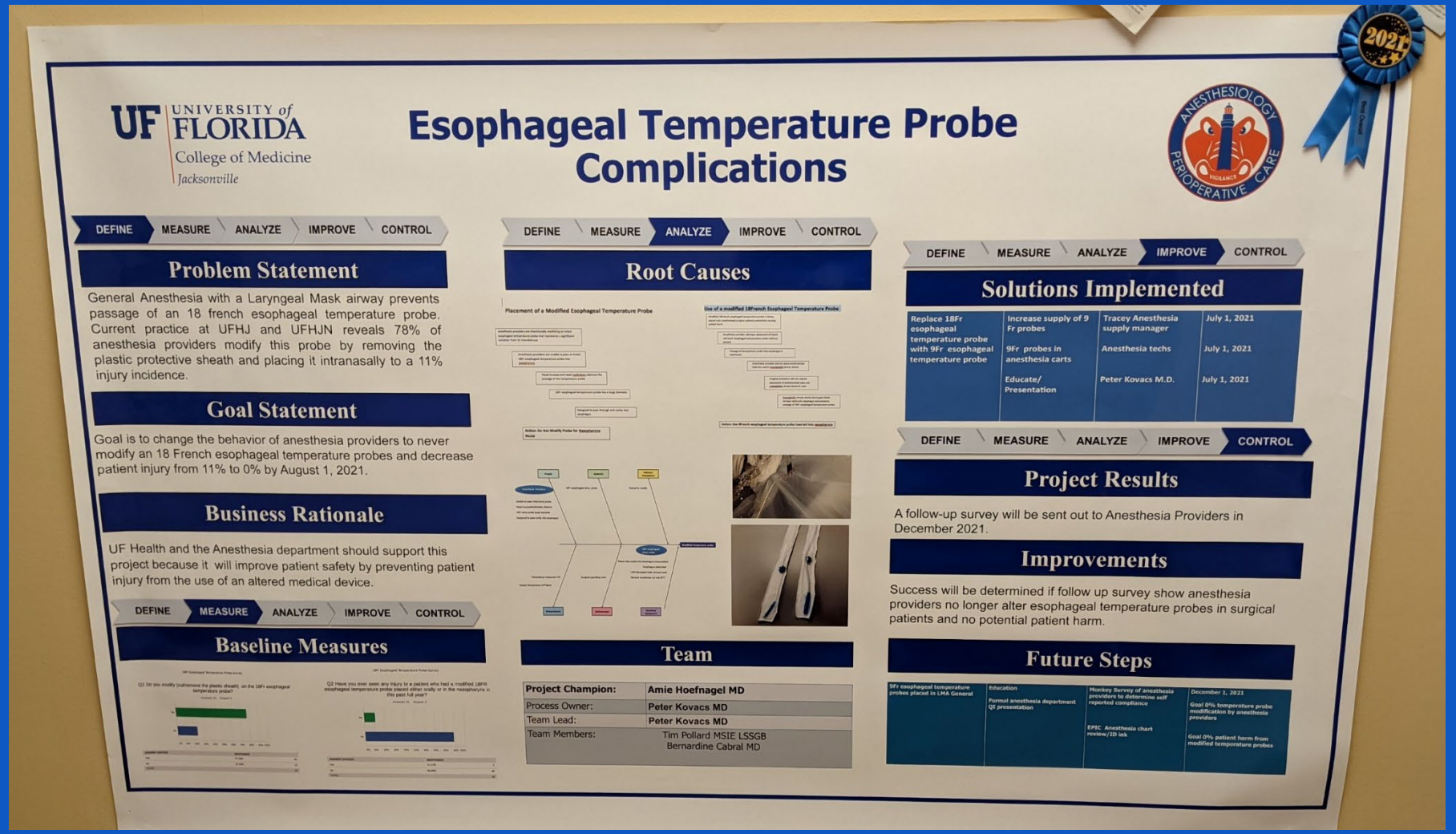


Future Steps

-Will keep sending reminders to L&D nurses about bucket and virtual kit till the process engrave in minds.
- Follow and monitor the process and solve any new obstacles come up.

Course	Name of Project	Anesthesia Participants	Roles	Awards
2021-2022 Year	Drug labeling safety, quality & efficiency	Nicole LeClair & Brad Randolph	Residents	
2021-2022 Year	Pain management order set	Kyle Glasser, Michael Aiello & Clinton Wilkinson	Residents	
2021-2022 Year	Anesthesia-specific drug infusion pump labeling	Mohamad El Churafa & Kishan Patel	Residents	
2021 Spring	Esophageal Temperature Probe Complications	Bernadine Cabral & Peter Kovacs	Resident & Faculty	Best Overall at 2021 UF-Jax Quality Poster Exhibition
2020-2021 Year	Pediatric Airway Trolley	Tia Timmermann & Jessica Bene	Residents	
2020-2021 Year	Cesarean Section Tray for Stat C-Section	Lakshmi Damalanka, Panumart Manatpon & Mohannad Abushora	Residents & Fellow	Best QI Project at UF-Jax Celebration of Resident/Fellow Education & Research Day
2020-2021 Year	OR to SICU Handoffs Process - Staff Satisfaction	Jose Humanez & Adrienne Warrick	Faculty	
2020-2021 Year	Decrease cancellation/delays of Noncardiac Surgery Patients with increased PAT communications	Deborah Maxwell-Hodges & Adrienne Warrick	Advanced Practitioner & Faculty	
2020 Spring	Design & Implementation of Anesthesia Preoperative Evaluation Note to improve efficiency and compliance	Carol Diachun	Faculty	
2020 Spring	Preoperative warming to prevent hypothermia	Guy Kositratna & Oladapo Oshikoya	Residents	
2020 Spring	Hyperglycemia protocols	David McEnerney & Kaitlyn Kamrowski	Residents	Best Use of LSS Methodology at 2020 UF-Jax Quality Poster Exhibition
2020 Spring	ICU to OR and OR to ICU Handoffs - Standardization	Bradley Ullman & Richard Tennant	Residents	
2019 Fall	Team debrief exercise & tool for Healthcare Providers following an adverse or stressful event	Bernadine Cabral & Jordan Galcian	Fellows	

2021 Quality Poster Exhibition – First Place



Quality and Performance Improvement

UF Health Jacksonville