Physician Quality and Safety Academy

Class of 2008

Compendium of Projects
Special thanks to

Juanita Romans, CEO, whose vision was to partner with physicians as improvement leaders in the organization.

Jeffrey Katz, MD, Chief Medical Officer, who provides critical physician leadership for quality improvement.

Giuseppe Colasurdo, MD, Dean of the UT Houston Medical School, who has supported this program and other programs like it, as part of his efforts to improve the quality of care provided by UT faculty.

and

Kenneth Shine, MD the UT Vice Chancellor for Health Affairs, whose goal was to implement this type of training at all UT System health campuses.
Welcome to the first edition of our Physician Quality and Safety Academy compendium. This program was developed jointly between the UT Houston School of Medicine and Memorial Hermann-TMC recognizing that today’s healthcare delivery systems are so complex that physicians need specialized knowledge and skills to help them improve systems and lead quality and safety efforts. We believe this skill is critical to the practice of medicine now and in the future.

In December of 2008, we graduated our first class of seven physicians. In the following pages we have included a summary of the didactic content of the Academy and the projects completed by this year’s class. We look forward to their continued leadership in our quality and safety efforts.

Please join me in congratulating them on their achievements and in supporting their ongoing improvement work.

Eric J Thomas MD MPH
Director, Physician Quality and Safety Academy
Griff T Ross Professor in Humanities and Technology
Director, UT Houston-Memorial Hermann Center for Healthcare Quality and Safety
Professor of Medicine
Academy Overview

The Academy was developed to train physicians in the tools and techniques of improvement science. Today’s medicine is practiced in a complex environment of systems, people and processes that requires continuous evaluation and improvement to assure high quality care and keep pace with changing knowledge.

Goals:
• Assure medical staff involvement in defining and attaining quality and safety goals
• Advance expertise in the science of improvement to enhance patient care and safety
• Develop physician leaders in quality and safety who are recognized nationally

Format:
• Didactic training, coaching and completion of clinical quality improvement project
• 1 year duration --approximately 14 days including both class work and project completion
• Support for Academy projects provided by TMC Six Sigma Black Belts
• Didactic work includes an overview of clinical quality and patient safety, the physician’s role in assuring quality, clinical patient population modeling and management, reducing variation, statistical process control, managing effective teams as leaders and statistical and improvement tools.

Participant selection and Academy commitment
• Nominated by Department Chair
• Project selection in conjunction with Department Chair and Academy leadership
• Attendance at Academy sessions and outside meetings
• Project completion---local presentation of project progress and outcomes
• Presentation at national meetings
The Academy’s didactic curriculum centers around the DMAIC (Define, Measure, Analyze, Improve, Control) process as defined by Six Sigma improvement principles.

Every Academy day is designed as a fast-paced, hands on learning lab. For each DMAIC phase, the specifics of that phase are covered and related to every participant’s selected project. In addition to learning a variety of improvement tools, participants are assigned “deliverables” at each phase. These are specific tasks that reinforce learning and competency, keep projects on track and assure successful outcomes.

The following pages outline the details of the curriculum and lists the faculty participants.
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<thead>
<tr>
<th>Day</th>
<th>Six Sigma Project Phase</th>
<th>Improvement Tools</th>
<th>Deliverables</th>
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<tr>
<td>Day 1</td>
<td>Define</td>
<td>• Project Charter • Elevator speech • www • Stakeholder analysis • Affinity diagram • Plus / Delta • VOC • RCT • PDCA • Plus Delta • DMAIC</td>
<td>• Project Charter • Aim statement • Work Plan • Elevator speech • Team selection • Stakeholder analysis</td>
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<tr>
<td>Day 2</td>
<td>Measure</td>
<td>• Measurement System Analysis • Flow chart • Cause &amp; effect diagram • Brainstorm • CTQs • Run charts • SPC</td>
<td>• Initial Measure • Balancing Measure • Y • X’s • CTQs</td>
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<tr>
<td>Day 3</td>
<td>Analyze</td>
<td>• Box plot • Pareto • Time Series • Histogram • Run Chart • Control Chart • Check Sheet • Scatter Plot</td>
<td>• Completion timeline (Gantt chart) • Critical X identification</td>
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<td>Day 4</td>
<td>Analyze</td>
<td>• Process capability • Statistical Process control • Risk adjustment stratification • Sample Size • Prediction • Statistical significance • Simple statistics</td>
<td>• Sample size verification • Risk stratification • Statistical significance calculation</td>
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<tr>
<td>Day 5</td>
<td>Improve</td>
<td>• DPMO • Sigma Level • Bias identification</td>
<td>• Project review • Data needs • Data evaluation • End of project planning</td>
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<tr>
<td>Day 6</td>
<td>Control</td>
<td>• Control plan • Bayesian Statistics • Financial Models • Kirkpatrick evaluation model</td>
<td>• Project finalization • Control Plan • Financial impact calculation • Final evaluation</td>
</tr>
<tr>
<td>Graduation</td>
<td>Control</td>
<td>• Presentation style • Succinct massage • Project completion</td>
<td>• Final Presentation • Poster</td>
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</tbody>
</table>
Academy Faculty

University of Texas Medical School at Houston Memorial Hermann Texas Medical Center

Eric Thomas, MD, MPH, Director
Robert Murphy, MD
Michael Shabot, MD
Jeffrey Katz, MD
Dan Wolteman, CEO
Charles Miller III, PhD
Jon Tyson, MD MPH
David Strickler, MBA, CPA
Lillian Kao, MD
Claudia Pedroza, PhD

Jamie McCarthy, MD
Luis Ostrosky-Zeichner, MD
Bela Patel, MD
Emily Robinson, MD
Pamela Berens, MD

Six Sigma Black Belts
Katharine Luther, RN, MPM
Kathy Masters, MSRD
Michael Williams, MS
Susan Engleman, RN, MSN, APRN-BC, PNP

National Improvement Leaders—Academy Speakers

Brent James, MD, M. Stat,
Executive Director, Institute Health Care Delivery Research, Intermountain Health Care, Utah.

James Conway, MS
Senior Fellow, Institute for Healthcare Improvement, formerly CEO Dana Farber Cancer Institute, expertise in Patient-Family Centered Care and leaders role in quality.

James Reinertsen, MD, FACP
Senior Fellow Institute for Healthcare Improvement, former CEO, CareGroup, Boston, 6 hospital, 1400 physician system and Professor of Medicine, Harvard.

Kenneth W. Kizer, MD, MPH
Healthcare Consultant, former Under Secretary for Health, US Department of Veterans Affairs, founding president and CEO of National Quality Forum

James Bagian, MD
Chief Patient Safety Officer, Veterans Health Administration, former astronaut, NASA
Graduation ceremony pictured from left Craig Cordola, CEO, Children’s Hospital, Khalid F. Almoosa, MD, MS, Yashwant Chathampally, MD, MS, Matthew T. Harbison, MD, Galit Holzmann-Pazgal, MD, Amir M. Khan, MD, Julia Shelburne, MD, Felix W. Tsai, MD and Juanita Romans, CEO, TMC.
Biosketches Academy Class of 2008

Khalid F. Almoosa, MD, MS graduated from the Royal College of Surgeons in Dublin, Ireland, completed a residency in internal medicine at the Medical College of Wisconsin and a fellowship in Pulmonary Critical Care at the University of Cincinnati. He was a faculty member at the University of Cincinnati, prior to joining UT in the division of Pulmonary Critical Care and Sleep Medicine.

Yashwant Chathampally, MD, MS completed medical school at the State University of New York, Brooklyn and a residency in Emergency Medicine at New York Medical College. In addition, he earned an MS in Clinical Research at Albert Einstein Medical School and served on the faculty at New York Medical College before joining the UT department of Emergency Medicine.

Matthew T. Harbison, MD graduated from the UT School of Medicine. He completed a residency in Internal Medicine and Pediatrics at Duke University and served on the faculty at the University of Michigan. He is currently UT Associate Program Director for Internal Medicine and the Internal Medicine/Pediatrics Residency and is a hospitalist in the Division of General Medicine.

Amir M. Khan, MD is a graduate of the Aga Khan University in Karachi, Pakistan. He completed a residency and fellowship in Neonatal and Perinatal Medicine at UT before joining the faculty in Neonatal-Perinatal Medicine. He serves as Medical Director of Children’s Respiratory Care and the Neonatal Transport Team.

Galit Holzmann-Pazgal, MD is a graduate of Northwestern University Medical School in Chicago. She completed a pediatric residency at Rainbow Babies and Children’s Hospital, Case Western Reserve University, Cleveland and an Infectious Disease Fellowship at St. Louis Children’s Hospital, Washington University in St. Louis. She served on the faculty at Washington University School of Medicine before joining the Pediatric Infectious Disease Faculty at UT.

Julia Shelburne, MD graduated from Baylor College of Medicine. She completed a pediatric residency and served on the faculty at Baylor before joining the UT Pediatrics Division in Community and General Medicine.

Felix W. Tsai, MD graduated from Northwestern University Medical School in Chicago and completed a general surgery residency at Morristown Memorial Hospital in Morristown, New Jersey. He went on to fellowships in cardiothoracic surgery at the George Washington University and pediatric cardiothoracic surgery at the Medical University of South Carolina in Charleston. In addition, he spent a year as a research fellow in pediatric cardiothoracic surgery at Arnold Palmer Hospital in Orlando, Florida, before joining UT as a pediatric cardiovascular surgeon.
Ideal projects should be designed in a circumspect manner, focused on a specific goal and achieve results which are easily transferrable to other areas.

**Suggested areas include:**

- **Patient population based** Quality of care and/or patient safety (ex: reducing mortality in sepsis patients, improving care for low-acuity surgical patients, managing glucose in diabetic patients)
- **Teamwork** (ex: improving teamwork and outcomes for Rapid Response, Code or Resuscitation teams; improving hand-off communication among resident teams)
- **Patient flow** (ex: reducing wait times in ambulatory clinics, improving “patient to bed” time for EC admissions)
- **Patient safety** (ex: increasing “close call” medication error reporting; improving medication dosing safety for neonatal patients)

The following pages include the projects completed by the Class of 2008. They encompass Quality of Care, Patient Flow and Patient Safety. They were all designed to address identified needs in the participant’s area of practice. Results and themes are easily transferrable to other clinical areas.
Effect of an Early Family Conference on Decreasing Futile Care in Patients at High Risk of Death in the ICU

Team: Khalid F. Almoosa MD, MS Ruthie Siska RN, Tammy Campos RN, MSN, Bela Patel MD, ICU fellows, Palliative care team

Define
Critically ill patients at high risk of death in the ICU often receive prolonged and aggressive life-sustaining therapy before death. This futile care contributes to uncomfortable and poor quality care, poor family satisfaction, prolonged stays, and increased costs with a similar outcome. Lack of communication with families is an important component of end-of-life decision-making that may increase futile care in the ICU.

Measure
For 225 patients who died in the MICU from 1/07 to 6/08, a randomly selected sample of 31 patients was selected to determine baseline data. The median MICU length of stay was 5 days. 31% had documented family meetings before death.

Analyze
Cause and effect analysis revealed several causes for the absence of regular family meetings:
• Absence of a clinician leader or designated team
• Lack of a structured format for discussions
• Lack of a standard policy towards family meetings
• Poor understanding of communication by the MICU team members
• Reluctance to discuss end-of-life issues

Improve
The intervention included multidisciplinary family meetings within 24 hours of admission for all ICU patients at high risk of death (severe illness or the presence of a terminal illness). We used MICU length of stay as a surrogate measure of use of life-sustaining therapy for patients who ultimately died in the MICU.

Control
Develop a protocol to initiate family meetings for high-risk patients. Educate staff and residents on effect of family meetings on patient outcomes. Provide a structured family meeting format. Identify the core participants for these meetings.

Patients' Demographics | Before | After
--- | --- | ---
Age (years) | 55 ± 18 | 64 ± 19
Gender (% male) | 50% | 47%
Admission diagnosis
Acute respiratory failure | 58% | 77%
Sepsis or other infection | 42% | 63%
Had family conferences (%) | 31% | 57%
Made DNR in MICU (%) | 87% | 96%

LOS: length of stay
LST: life-sustaining therapy

* P = 0.05
Evaluating Effectiveness of an Emergency Center Chair Unit in a Tertiary Academic Medical Center

Team: Yash Chathampally, MD MS, Jamie McCarthy, MD, Sylvia Reimer, RN, LP, CEN, Emeka Okafor, MD, Greg Press, MD

Define
The Emergency Center sees an average of 107 adult patients per day with a 37% admission rate. With increasing volumes and a 60% treat and release rate, it may be possible to care for ambulatory patients who will be discharged in a setting other than in traditional beds.

Measure
Baseline data was analyzed between January and June of 2008. It showed that Level 3-Urgent Patients accounted for 62% of all patients seen and that 65% of those were discharged home. During the baseline period their turn-around-time (TAT) was 323 minutes.

Analyze
The traditional EC model of treating patients in "beds" is designed for critically ill patients but may not be efficient for certain patient subtypes that represent a large % of ED volume. Given EC volumes and capacity demands treating these patients in an adaptable "chair" unit may better serve their needs.

Improve
A five-station chair unit was set up to treat Level 3 patients with minor illnesses and injuries including asthma, extremity trauma, eye and ENT complaints. The unit operated during the month of September 2008 on selected days between the hours of 1:00 PM and 7:00 PM. Using March – June 2008 as a baseline, the TAT for Level 3 patients discharged home went from 323 minutes to 239 minutes compared with the same time period and days. This represents an 84 min or 26% reduction.

Control
Further analysis will determine feasibility of the unit as well as its impact on wait times, patient satisfaction and safety.
Improvement of VTE Prophylaxis on the Resident General Medicine Services

Team: Matthew T. Harbison, MD, Mark Warner, MD, Theresa Hoang, MD, Seth Politano, MD, Korey Ullrich, MD, Jeremy Huff, MD

Define
Venous Thromboembolism (VTE) prophylaxis is critical to prevention of deep vein thrombosis a potentially fatal complication in hospitalized medical patients.

Measure
Initial chart review of 64 medical patients showed that 32 (50%) had a VTE risk assessment documented while 32 (50%) did not. In addition, there was little correlation between initial assessment and correct treatment. The same data set showed that 22 (43%) of patients received correct treatment, 12 (19%) received either no treatment or contraindicated treatment, and 15 (23%) received prophylaxis with no indication.

Analyze
Reasons for variation included non-standard process for completing and documenting initial History and Physicals, disparate prescribing patterns among residents, and lack of recognition of special needs of sickle cell patients. The problem was localized to patients admitted to the floors. Those transferred from the MICU were receiving correct treatment based on MICU protocols.

Improve
Improvements focused on floor patients and included:
• Standardizing treatment regimens
• Agreement on medication selection, dosing and frequency
• Ongoing education of residents
• Implementation of a teaching guide to prompt correct assessment and prescribing and serving as a data collection tool

Control
Improvements will be maintained by:
• Standardizing admission order sets
• Including VTE prophylaxis in core quality competency on resident evaluations
Standardization of Respiratory Management of Premature Infants in the NICU

Team: Amir Khan, MD, Sheranda Jones, RN, MS, Curtis Shelley, RCP, Ann Kubanda, RN, Stephanie Broussard, RN

Define
Chronic Lung Disease (CLD) is a preventable complication of prematurity. Specific ventilator strategies may decrease complication rates.

Measure
The CLD rate is 30.9% at CMMH based on the Vermont Oxford Network comparisons. The 1st quartile performs at 14.9%. Volume Targeted Ventilation (VTV) may decrease CLD rates, but is currently used in only 50% of patients. In addition, 20% of patients stay on a ventilator longer than needed.

Analyze
Reasons for these results included lack of recognition and understanding among the physicians, residents, NNP's, RTs, and nursing staff of the benefits of a standard approach, lack of knowledge of how to apply VTV, no standard process to order and no standard way to wean infants off of ventilation.

Improve
Improvements included:
• Attitude survey to determine MD preferences
• Developing standardize protocols
• Standardization of order sets
• Education to all staff about the value and “how to” of consistent approach

Control
Improvements will be maintained by:
• Core group of RNs and RTs responsible to monitor compliance, identify problems, and recommend improvements

Implementation Goals:
• 50% reduction in unplanned extubations
• 100% compliance with order set usage
Surgical Site Infection Preoperative Process Improvement in Pediatric CV Surgery

Team: Galit Holzmann-Pazgal MD, Felix Tsai MD, Beth Gould RN, BSN, Misty Amaro RN, Sheranda Jones RN, MS, Amir Khan MD, Shannon Briggs RN, Douglas Maposa MD, Maria Matuszczak MD, Chuck Monney, RN

Define
Pre-operative bathing with an antimicrobial product is a recommended component of preoperative interventions aimed at decreasing the risk of surgical site infections.

Measure
Compliance rate for patients receiving any bath prior to surgery was 7% pre-intervention. No patients received 2 baths pre-intervention. Post-intervention 77% of patients had at least one preoperative bath and 45% had 2 preoperative baths.

Analyze
Cause and effect analysis revealed a lack of recognition on the part of nursing staff, no standard process or policy, patients arriving at the OR from multiple points, no instructions for parents and lack of supplies for nursing staff.

Improve
Improvements included:
- Developing and standardizing CV surgery preprinted orders for pre-operative bathing
- Educating staff about importance/process of bathing
- Assuring supplies are available to day surgery staff
- Developing instructions for parents of ambulatory patients for bathing night prior to surgery
- Standardizing documentation
- Identifying single point source for preoperative orders

Control
Improvements will be maintained by:
- Maintaining preprinted orders in all key areas (Ambulatory Surgery, PICU, NICU)
- Assuring orders are placed in preoperative charts
- Giving parents instructions for bathing in anesthesia clinic for patients admitted via Ambulatory Surgery
- Monitoring compliance for pre-operative bathing
- Presenting compliance rates at service line and staff meetings
Improving Compliance with Isolation Precautions in the Pediatric Hospital

**Team:** Julia Shelburne, MD, Amber McKenzie, RN, BSN, Michelle White, RN, BSN, CPN, Joan Robertson, RN, Galit Holzmann-Pazgal, MD, Charles Green, PhD

**Define**
Timely isolation of children in a Pediatric Hospital is critical to preventing the spread of infection. In many cases, children are not placed in the correct type of isolation or isolation implementation is delayed, putting other patients at risk for nosocomial infections. Healthcare workers are also at risk for occupationally acquired infections.

**Measure**
Initial data revealed that 35% of patients whose admission diagnosis warranted transmission-based precautions were placed in isolation. In addition, the median time to order isolation was greater than 48 hours.

**Analyze**
Current infection control process relies on physicians to write orders for transmission-based precautions (isolation for communicable diseases). In addition, nurses report unclear guidelines about how to isolate patients, inconsistency about the need for isolation, unavailability of isolation carts and supplies, and unclear guidelines about how to isolate for specific conditions.

**Improve**
Improvements included:
- Standing orders for transmission-based precautions
- Nurse-implemented isolation based on protocol
- Replacement of isolation cart (ordered from central supply) with isolation supplies readily available on the unit
- Education sessions with staff about new protocols and orders

**Control**
Improvements will be maintained by:
- Monitoring rates of appropriate isolations
- Reporting and discussion with staff and physicians during regular meetings
- Ongoing education of staff
Improving Blood Product Delivery to the Operating Room for Pediatric Cardiothoracic Surgery

Team: Felix W. Tsai, MD, Rhonda Hobbs, Douglas Maposa, MD, Heather Dunne, CCP, Orieji Illoh, MD, Sarah Eshelman, CCP, Shannon Wright, CCP, MBA - Green Belt, Janette Gutierrez, RN, Raul Guardiola, Cheryl Bartolome, RN, Jose Delgado, ST, Susan Burroughs, RN, Beth Gould, RN, BSN, and William Douglas, MD

Define
Delays in blood product delivery to the operating room after a bypass run can result in increased blood loss, increased use of blood products, wastage of blood products and ultimately, poor patient outcomes.

Measure
Pre intervention time from blood product ordered to blood products delivered was 48 minutes (range: 38-72 min)

Analyze
Reasons for delays included no standards between blood bank and surgeons identifying what products might be needed, unclear assignment of roles within the surgical team, and protocols in place that didn’t reflect actual blood needed for specific type of case

Improve
Improvements included:
• Standardizing blood product needs by case
• Assigning responsibility and roles: Anesthesia orders blood, circulating nurse calls blood bank, coordinates runner, documents time blood received
• Preset amounts of blood ordered – minimize variation and waste

Control
Improvements will be maintained by:
• Continued measurement of time to delivery
• Periodic review with blood bank of delivery times, needs by case type, etc

Initial Neonatal Blood Product Protocol

<table>
<thead>
<tr>
<th>Case Type</th>
<th>Fresh RBC (≤ 7 days)</th>
<th>Washed RBC (≤ 7 days)</th>
<th>Platelets</th>
<th>FFP</th>
<th>CMV</th>
<th>Irradiated</th>
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<tbody>
<tr>
<td>Prewynn</td>
<td>2</td>
<td>0</td>
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<tr>
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<td>2</td>
<td>4</td>
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<td>Prewynn</td>
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<td>2</td>
<td>4</td>
<td>2</td>
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</tbody>
</table>

Revised Neonatal Blood Product Protocol

<table>
<thead>
<tr>
<th>Case Type</th>
<th>Before CPB</th>
<th>After CPB</th>
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</thead>
<tbody>
<tr>
<td>Prewynn</td>
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<tr>
<td>Prewynn</td>
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<tr>
<td>Prewynn</td>
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All neonates to receive irradiated, CMV negative blood

Potential Savings
• Decreased blood requested per case by standardizing orders
• Decreased OR time by 28 min per case
• 50 complex cases per year @ 28 minutes saved per case
• $8400 in OR time annually

Blood Delivery Time

Goal 30 min.
At the conclusion of this year’s session, Academy participants provided feedback on the strengths of the program as well as defining areas for improvement. The graph below summarized their quantitative feedback.
The following comments and suggestions guided the development of the Academy program for 2009.

**Best things about the academy:**
- Content and the process
- Support from academy faculty
- Speakers, statistical support
- Very exciting and motivating
- Generated ideas for further projects and training
- Provided a structure for initiating quality improvement projects
- Providing access to green belts to assist with future projects

**Things to improve:**
- Add more practical examples of how to tools throughout the course
- Consider half-day sessions
- Involve more statistics at the beginning
- Add more deadlines to push us
- Provide more advice on how to publish
- Give more advanced notice of outside speakers as possible

**The organization can best support our ongoing efforts by:**
- Using us as a resource to catalyze more projects
- Using us as project participants in the future
- Creating and supporting a dedicated quality and safety committee
- Fostering intradepartmental and interdepartmental collaboration
- Assuring more protected time from supervisors