ALLIANCE OF INDEPENDENT ACADEMIC MEDICAL CENTERS

Innovation Application Form

Institution Name:	Crittenton Hospital Medical Center and Wayne State University
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1. Please describe how the nominee has developed and/or implemented *innovative medical education programs* for residents, physicians and other staff which have resulted in better patient outcomes: (OR answer question 2)

Title of Project: Aligning Graduate Medical Education with Hospital's Quality Improvement and Safety Strategies

Description and Background

The public and profession acknowledge that quality and safety in health care needs improvement. Residents play an important role in patient care at teaching institutions. Resident quality improvement (QI) efforts, shared across multiple programs, have the potential to improve care more quickly and effectively. The ACGME included Practice-Based Learning and Improvement (PBLI) and Systems-Based Practice (SBP) as 2 of its 6 core competencies, so it is imperative for residency programs to focus on them. Although many are involved in QI projects, very few have a systematic approach with integration with the hospitals' strategic initiatives. Data for educational and clinical outcomes is limited. The purpose is to design QI and safety initiative with all 3 Wayne State University-sponsored Internal Medicine, Family Medicine, and Transitional Year Residency Programs at the primary hospital, Crittenton Hospital Medical Center (CHMC), leading to sustainable institution-wide change. In addition to integrating research, educational, and clinical objectives, the project is a testament of a strong partnership between an academic medical center and an independent hospital. It involves developing a curriculum with a combination of QI knowledge acquisition, team building and experience-based strategies. Residents work in interprofessional teams to understand their workplace, collect and present data, and propose interventions for improvement of care.

Goals & Objectives

The project goals can be categorized in three main areas: organizational, clinical and educational. Overall institutional objectives include:

- Alignment of Graduate Medical Education with hospital strategic planning to improve quality of patient care.
- Recognition of the central role of residency programs in quality improvement and patient safety.
- Acknowledgement of the potential for faculty and residents to be change agents for quality improvement and patient safety.
- Completion of quality improvement and safety projects based on the hospital's strategic planning with specific patient care and process improvement outcomes and calculated return of investment.
- Providing team training, leadership and support to the team, and equip participants with the tools and infrastructure necessary to accomplish meaningful improvements within the home institution by increasing participants' teamwork competencies.

Clinical objectives include:

- Improved patient care quality
- Improve compliance with EBM guidelines
- Decrease over-utilization of resources
- Improve efficiency of process

Educational objectives include:

- Development of a QI interdisciplinary educational curriculum
- Enrichment of teaching skills and methods in the field of quality improvement and safety
- Improving teamwork and leadership competencies
- Meeting and exceeding the requirements of the ACGME core competencies on system-based practice and practice-based learning and improvement
- Preparation for the institutional Clinical Learning Environment Review (CLER) visit
- Local and regional scholarship presentations of outcomes
- Opportunity to author one or more manuscripts at the conclusion of the series

Implementation

The Project Champion, Dr. Markova, Associate Dean for GME and DIO, started the initiative in the spring of 2011. Informed by a thorough literature search, she assured stakeholders support. The project was presented at the WSU SOM Deans' meeting and at the Hospital Leadership Forum and received very positive feedback. We created a powerful coalition, including a Leadership Team of the 3 Program Directors, the hospital CMO and the hospital Director of QI (Frank Sottile, MD, CMO, CHMC; Sharon Ulep, Director QI, CHMC; Pierre Morris, MD, FM and TY Program Director; William Murdoch, MD, FM Assistant Program Director, and Khalid Zakaria, MD, IM Program Director). The project was accepted in May as a part of a National initiative (NI3) through the Alliance of Independent Academic Medical Centers (AIAMC) to provide a national opportunity for quality research and additional resources. We also obtained HIC approval for data collection and dissemination of results.

The Leadership Team started meeting in November 2011 to established goals and objectives of the initiative. It identified 3 QI projects that align with the hospital strategic initiatives: Global Immunization, COPD Readmission, In-House Septic Shock. Team membership was identified based on the nature of the projects. The initial projects time line was set for January 2012 to June 2012. We all committed for long-term engagement. It was decided that each academic year a new 6-month cycle will be instituted (Jan-June). The new cycle will involve assembling of new teams and repeating the didactics and team training curriculum, along with completing QI projects. The projects would be either ones that build on the results from the previous cycle or new ones, based on the hospital's current priorities.

Residents from the Internal Medicine (IM), Family Medicine (FM), and Transitional Year (TY) Residency programs were approached to volunteer to be involved in this project. The project sponsors (Program Directors) agreed to mentor the residents and provide resources, including time for them to participate in all associated activities. 7 residents volunteered to be involved, divided in three teams for completion of three quality improvement projects. Each team consisted of 6-7 members. The other team members included volunteers from the hospital staff based on the nature of the project (quality improvement

specialists, nursing, data management, discharge planning, utilization management, and information technology). They developed the project charters of the initial three projects.

•Project 1: Global Immunization

- Focus on new Core Measure requirements for - Influenza vaccination for ALL patients (6mos +) - Pneumococcal vaccination for ALL patients (50+ yrs) - Pneumococcal vaccination for HIGH RISK patients (6yrs – 50 yrs)
- Goal: Creating a systematic structure for insuring that all patients are assessed and that vaccinations are delivered
- Project Champion: Dr. Bill Murdoch, Family Medicine Program
- FM Residents: Hussaini Hina Syeda MD, and Christina Kimbrough MD
- Hospital Staff: Carol Parker RN, MSQS and Kate Wilcox

•Project 2: COPD Readmission

- Focus on reducing preventable COPD readmissions and careful evaluation of why patients are likely to be readmitted
- Goal: Developing a systematic process to help reduce factors that cause readmission
- Project Champion: Dr. Pierre Morris, Transitional Residency Program Director
- TY Residents: Jason Zeidan MD, and Roman Barraza MD
- Hospital staff: Gail Tack RN, MSQS; Cheryl Wegener RHIT, MSQS

•Project 3: In-House Septic Shock

- Expanding the efforts of the ED Sepsis team to address Rapid Response to Septic Shock in patients admitted to the General floors
- Goal: Using Keystone Sepsis EBM tools to prevent mortality
- Project Champion: Dr. Khalid Zakaria, Internal Medicine Residency Program Director
- IM Residents: Zeina Arnouk MD, Kavyashri Jagadeesh MD and Alaeddin Maeza MD
- Hospital Staff: Jan Martin RN, MSQS and Eric Mullarky, Process Engineer

Our educational strategy included theoretical teaching of the quality improvement principles, teamwork and leadership strategies, and experiential learning through completion of the quality improvement projects. In order for the teams to be successful in completing their Quality Improvement projects, we developed 5 days of organized training sessions, starting in February, and including didactics and team exercises for all members of the 3 teams. The training sessions were led by the hospital Director of Quality Improvement, black belt Six Sigma. Participants were expected to meet the following learning objectives:

- Define: Objectives (Day 1)
  - Understand how to gather information about a process
  - Identify the “Y” and “X’s” of a process
  - Develop the deliverables for a Process Improvement (PI) project
  - Understand what “Value” is to a customer
  - Organize a team to address a process problem
  - Use PI tools to help a project team to define a process
- Measure: Objectives (Day 2)
  - Determine which data to collect for a project
  - Develop a data collection plan
  - Develop a case for the Return on Investment of a project
  - Assess the progress of a project
- Analyze: Objectives (Day 3)
  - Assist in team facilitation
  - Develop a data collection plan
  - Analyze project data collected
  - Demonstrate knowledge of analysis tools for PI projects

- Improve: Objectives (Day 4)
  - Identify improvement strategies – WorkOut – RIE – Infrastructure/Education – Information Technology Process
  - Develop Standard Procedures (SOP)
  - Identify Visual Cue opportunities in your improvement strategy
  - Error proof your improvement strategy – FMEA, Poke-Yoke, Human Factor Considerations Control Objectives
- Control: Objectives (Day 5)
  - Implement a plan to monitor and control your new process - Using control charts
  - Transition new process to appropriate process owner
  - Identify strategies to sustain improvement
  - Prepare for final report out

Supplementary reading materials relevant to the training objectives were made available from the Institute of Healthcare Improvement (IHI) Open School, which is a free online course system. It consists of three online modules: Quality Improvement, Patient Safety, and Leadership. Each module contains 3 level courses (e.g. 101, 102 and 103) with 3-5 sessions. Each session is 15 minutes long with a pre-and post test. Access via: http://www.ihi.org/ihi. Clinical and educational outcomes are collected to measure improvement and assure sustainability.

Evaluation & Measurement

In January 2012, we collected preliminary information about baseline knowledge of all FM, IM and TY residents (49) and the Crittenton health care team members (100) about quality improvement and safety using an Internet-based survey. The participation was voluntary and with no individual identifiers. To evaluate educational impact, we used the Quality Improvement Knowledge Application Tool (QIKAT) developed by J Oyler, L. Vinci J. Johnson, V. Aurora, University of Chicago Medical Center. In addition, we included the Safety Attitude Questionnaire (SAQ)- Teamwork and Safety Climate, a valid and responsive to quality improvement interventions tool, developed by B. Sexton, E. Thomas, and B. Helmreich with funding from the Robert Wood Johnson Foundation and the Agency of Healthcare Research and Quality. The baseline results showed that from the 21(43% response rate)residents and 42 (14% response rate)hospital staff, 42 (67%) were not at all or just slightly comfortable with QI processes and only 11 (17%)had some experience with QI. We also measured the patient care impact of the completed clinical projects. We will monitor longitudinally the organizational impact by annual distribution of the SAQ-Teamwork and Safety Climate survey, sent electronically to all residents and hospital staff. Another measure of culture change is to successfully organize an Annual Quality Improvement Day to share all results to hospital administration, residents, faculty and staff. The project outcomes will be disseminated through publications and national presentations, e.g. at the annual AIAMC conference. After each cycle, a program evaluation survey and a debriefing session with all team members is being conducted to evaluate the content of the sessions, effectiveness of the presenter, and scheduling logistics, as well as give feedback for improving the next cycle.

Results

Clinical outcomes:

Immunization Project: The aim was to make sure that 100% of the patients hospitalized were immunized. If declined, the reasons should be documented. As a baseline, the team identified that 15% of the patients that were hospitalized in 2011 were being missed. The problem was identified and worked on through six sigma lean process. The patient initial assessment form was analyzed and changes were made to ensure that the immunization status was not missed from the beginning. Changes were also made at the level of nursing education, as well as with electronic medical records intake form.

Outcomes from the immunization QI project include improvement for immunization compliance rates of pneumonia and influenza; this is illustrated in the increased process yield.

Measure	Process Yield Before	After
Pneumonia Overall	94.8%	96.7%

Pneumonia Age 65+	96.3%	100%
Pneumonia High Risk	67.7%	93.5%
Influenza Overall	84.8%	*

* *Data abstraction and analysis for the Influenza Measure will begin again in October 2012
Immunization core measures data will be available for comparison beginning in October 2012

COPD Readmission Research Project: Data collection showed that 19.85% of COPD patients were readmitted to Crittenton within 30 days during 2011. This data served as a mean to identify any factors that would decrease readmissions. The team investigated the presence of factors that might influence readmission, like patient' BMI, % of documented Rx Bronchodilator therapy at discharge, % of documented pulmonary consultation, % of up to date immunization status (Pneumococcal and Influenza), % diagnosis of Anxiety, % spirometry ordered during stay, % long-term oxygen therapy ordered prior to discharge, and % with documented follow up arrangements. The observed trends published by the literature correlated with our data collection that indicate COPD patients will naturally require more frequent admissions based on the course of the disease, and none of these factors influenced readmission rate in our sample. Research of process led to recommendation for improvement of standardized care set that allows tracking of discharge planning and follow up to ensure compliance.

Sepsis Process Improvement: The team initially assessed the gap in the care provided to the patients admitted under the diagnosis of severe sepsis/septic shock by retrospective chart review of 66 patients in the past 6 months. Out of 66 patients none of the patients got complete care as directed by current guidelines (fluid bolus within 1 hour, antibiotics with 1 hour, CVP catheter in 6 hours, and lactate measurement). After analyzing the data we collected, we designed and implemented the QI project. Sepsis screening tool was implemented in the electronic medical records for early detection of sepsis cases. A team comprising of physician, nurses pharmacist and therapist was educated to respond to the alerts. Workshop was organized to train the residents in managing the sepsis patients. This team would also be responsible to expedite the process of transfer to ICU if necessary. Results also include development of SEPSIS order set, activation of rapid response protocol and education to clinical staff. At project closure all improvements are in progress with follow up data to be collected following implementation.

Organizational and Educational outcomes:

The results of the quality improvement projects were presented by the teams to the hospital administration and staff, other residents and faculty at the established by us first hospital-wide Quality Improvement Day on June 20, 2010 in more than 150 people in attendance.
In addition to the clinical projects' impact and the impact on the organizational climate, teams were provided the same survey to determine quality improvement knowledge before beginning the education series and immediately following the final project presentations. Responses show improvement in knowledge and comfort in use of quality assessment and improvement skills (baseline average score of 3 on a scale of 1-4, post intervention average score of 3.4).

Future Steps and Sustainability:

To sustain the results and continue the project, the Leadership Team continues to meet on a monthly basis. It is planning the 6-month project cycle for the academic 2012-2013, including again three teams, working on 3 separate projects. The second sycle is planned to start in January 2013 and continue till June with outcomes presentations in the end of June at the Hospital Quality Improvement Day. The three identified projects are: Pharmacy - PPI Use Cost/ Benefit; Early identification and treatment of pneumonia; Protocol and Utilization of DVT prophylaxis. We will continue to apply similar to the first cycle approach for educational intervention and measure clinical, educational and organizational outcomes.

Conclusion:

The project leverages the strength of the WSU as an academic institution and the hospital commitment to improving quality of patient care and safety. We demonstrated that aligning GME process improvement projects with the hospital's strategic objectives can lead to superior educational outcomes, reduced over-utilization of resources, improved patient safety and more efficient care delivery through teamwork with faculty, residents and hospital staff.

The results were shared with other hospital partners in the Metro-Detroit area and received overwhelmingly positive feedback from hospital administration. The Project Champion is currently engaged in creating similar infrastructure in 2 other regional hospitals, hosting WSU-sponsored residency programs in independent medical centers.

Discussion and observations from the experience:

- The needs assessment proved that QI competencies are lacking in residents and hospital staff
- Residents were able to engage with and lead interdisciplinary teams
- Didactic and experiential learning is powerfully synergistic
- Patient care improvements are very motivating to the teams
- It is challenging to coordinate schedules and carve out time for teams activities and meetings
- The results need to be disseminated: Present at the established by us hospital-wide annual Quality Improvement Day; Present at the Annual AIAMC and NI3 meeting in 2013; working on 3 publications.

Using a systematic approach, we successfully engaged the academic institution, WSUSOM with an independent partnering hospital to align medical education with hospital's patient safety initiatives. It had overwhelming stakeholder approval and support at all levels. There is a general realization that designing and implementing a curriculum that combines knowledge and skills acquisition for QI and safety is important. It also prepares the institution for the ACGME Next Accreditation System, especially the Institutional Clinical Learning Environment Review (CLER) visit. For the success of the project, interdisciplinary collaboration is the key. We are developing a more sophisticated evaluation system in the second cycle to evaluate clinical, organizational and educational long- term outcomes. As larger multicenter studies to evaluate the impact of such projects are lacking, we are working on developing a regional GME Consortium with a focus on QI and safety, which can be the framework for collaborative effort and data collection.

2. Please describe how the nominee has developed and/or applied *scientific discoveries* which have resulted in better patient outcomes: (OR you may leave blank if question 1 has been completed)

N/A

3. Has the nominee received national recognition for innovative medical education and/or research contributions?

X Yes □ No

If yes, please describe:

Crittenton Hospital Medical Center has made a strategic commitment to quality and patient safety in a variety of ways including participation in the IHI 5 Million Lives Campaign, 10 different Michigan Hospital Association Keystone Projects, and the creation of a Process Engineering Program that uses Lean, Six Sigma, PDCA, WorkOut and CAP Process Improvement methodologies to pursue perfection in clinical safety and process management.

Crittenton's commitment to Patient Safety through these projects has resulted in a sustained trend of zero Central Line Blood Stream Infections, zero Ventilator Acquired Pneumonia events, significantly reduced incidence of Catheter Associated Urinary Tract Infections, improved outcomes and reduction in perinatal injury due to a commitment in performing inductions and cesarean sections after the 39th week of gestation, a marked reduction in preventable re-admissions and best in class performance in multiple specialties including Cardiology, Orthopedics and Oncology.

Crittenton has been recognized in multiple forums as a patient safety leader including by HeathGrades.com (Patient Safety Excellence Award winner in 2009 in addition to multiple other specialty specific awards over multiple years), Michigan Keystone Patient Safety Award Winner and the Michigan Quality Council Quality Leadership Navigator Award in 2010.

The champion of this project, Dr. Markova has been recognized by several national awards for innovations in education:

2011 Parker J. Palmer "Courage to Teach Award"
(presented annually by the Accreditation Council for Graduate Medical Education to notable 10 out of 8,000 program directors for exemplary teaching of residents and leadership of innovative and effective residency programs. Winners of the award demonstrate excellent leadership and mentorship practices, teach excellent patient care and safety practices, encourage and achieve program development and innovation, and represent a strong role model to promote ethics of reflection and humanism)

2011 Honorary U.S. Army Spartan Award
(presented by the U.S. Army 3rd Medical Recruiting Battalion in recognition of commitment to medical education: a medal and a certificate of appreciation reading, "Your selection for this award demonstrates your ability to find innovative ways to teach residents and to provide quality health care while remaining connected to the initial impulse to care for others in this environment.")

4. If chosen for this award, will the nominee be present to receive it at the AIAMC 2013 Annual Meeting, to be held March 21st – 23rd in Naples, Florida? *(Please note the institution should ideally be represented by its CEO & CAO)*

x Yes □ No □ Not Sure

Please send this completed form to
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by e-mailing Kimberly@aiamc.org or faxing 888-AIAMC11 (888-242-6211)
NO LATER THAN MONDAY, DECEMBER 7, 2012