

Appendix Table. Summary of 2013-2017 the Academy for Quality and Safety Improvement (AQSI) Team Projects

Team Focus	Year	Measure(s)	Goal(s)	Institute of Medicine Aim of Care Addressed	Interventions	DMAIC phase - results at end of program	Results at 6 months	Results at 18 months	Comments
Summary of Academy for Quality and Safety Improvement (AQSI) Team Projects prior to Adjustment to the Program									
Improving on-time procedure starts in the Gastroenterology (GI) Lab	2013	GI procedure start time within 20 min scheduled	Achieve 90% start times within 20 min scheduled	Timely, Patient Centered	None	Analyze	Project discontinued	Project discontinued	Team changed focus to quality of screening colonoscopies
Improving blood pressure control in patients with chronic kidney disease followed in nephrology clinic	2013	Percentage of patients with last systolic blood pressure (SBP) >140	Reduce percentage of patients with SBP>140 to <20%	Effective	None	Analyze	Project discontinued	Project discontinued	Proposed dedicated hypertension clinic and home monitoring technologies not approved
Avoiding Unnecessary Continuous Renal Replacement Therapy (CCRT) in the Medical Intensive Care Unit (MICU) for patients with poor prognosis	2013	Percentage MICU patients with acute renal failure started on CRRT and duration of CRRT	Reduce CRRT by 25%	Patient Centered, Efficient	<ul style="list-style-type: none"> Policy that nephrology leads discussion of CRRT risks/benefits When initiated, plan for CRRT to be a time limited trial 	Improve – no results at end of AQSI	Project discontinued	Project discontinued	Discovery that prognosis of acute renal failure patients was more difficult to assess than initially thought
Prevention and treatment of diabetic ketoacidosis (DKA) in the hospital	2013	Length of stay (LOS) for DKA pts	Decrease LOS and recurrence of DKA during hospitalization	Effective, Efficient	<ul style="list-style-type: none"> Developed new DKA order set and protocol 	Improve – no results at end of AQSI	No results available	No improvement in LOS	Order set and protocol poorly adopted (used only in 35% DKA patients)
Improving transitions of care for patients hospitalized with heart failure (HF)	2013	Heart failure 30 day readmissions	Reduce readmissions to national average	Efficient	<ul style="list-style-type: none"> 48 hr. post-discharge callback by HF RN Early post-discharge HF clinic follow up 	Improve – no results at end of AQSI	Goal met	Sustained	HF transitions of care also addressed by other organizational efforts and subsequent teams
Increasing completed Power of Attorney (POA) documents for patients planned for stem cell transplant (SCT)	2014	1) Percentage of SCT patients with documented POA prior to SCT 2) MICU days prior to death in SCT patients	1) Increase patients with documented POA 2) Decrease MICU LOS in SCT patients	Patient Centered	None	Analyze	Project discontinued	Project discontinued	Training of clinicians proposed, but not implemented. Reliable trigger for POA completion not identified.
Reducing errant lab orders in the outpatient clinic lab	2014	Errant lab orders	Reduce errant lab orders from 3.3% to less than 1%	Efficient, Safe	<ul style="list-style-type: none"> Revised test codes in IT system Education to guide staff on proper order entry 	Improve – no results at end of AQSI	Project discontinued	Project discontinued	Project discontinued in anticipation of change in EHR.
Improving guideline-based management of febrile neutropenia	2014	Guideline adherent treatment for febrile neutropenia assessed by 6 process measures	Improve guideline adherent treatment	Effective	<ul style="list-style-type: none"> Febrile neutropenia order set created Education on management provided to clinicians 	Improve – no results at end of AQSI	Results not available	Guideline adherent treatment increased from 42% to 48%	Medical record review proved more time consuming than anticipated. Further improvement will necessitate use of order set by ED.
Ensuring follow-up for incidental findings on radiography completed in the Emergency Department	2014	Proportion of patients with a radiographic incidental finding that have a follow-up appointment scheduled	100% patients with incidental findings have follow up scheduled	Safe	<ul style="list-style-type: none"> Clinicians prompted in discharge instructions to document incidental findings which activates follow up referral order 	Improve – no results at end of AQSI	Goal met (see comment)	Results not available	Project leader indicated goal met at 6 mos., Result not verified.
Enhancing safety of procedural sedation in the Emergency Department	2014	Apneic events during procedural sedation	Achieve <1% apneic events in procedural sedation	Safe	<ul style="list-style-type: none"> Procedural sedation checklist Standardized physician protocol and procedure note Nurse end tidal CO2 education module 	Improve – no results at end of AQSI	Goal met	Sustained	Best estimate of baseline was apneic episodes in 4% of patients.

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Evaluation and improvement of red blood cell (RBC) transfusion thresholds in solid tumor oncology patients	2014	RBC transfusions in hospitalized solid tumor patients	Reduce RBC transfusions by 20% at 6 mos.	Efficient, Effective	<ul style="list-style-type: none"> Decision support incorporated into transfusion order set Physician education on risk/benefits of RBC transfusions 	Improve – no results at end of AQSI	48% reduction in RBC transfusions	Sustained	Statistically significant reduction without increase in post-discharge RBC transfusions.
Improving medical patients' transitions from the hospital to a frequently used skilled nursing facility (SNF)	2014	30 day readmissions from the specific SNF	Reduce readmissions by 5%	Efficient	<ul style="list-style-type: none"> Discharge checklist Pager for receiving SNF physician 	Control - 30 day readmissions declined from 7.9% to 7.4%	Project discontinued	Project discontinued	Readmission rate less than originally thought.
Summary of Academy for Quality and Safety Improvement (AQSI) Team Projects after Adjustments to Program									
Standardizing the care of patients with sepsis and septic shock presenting in the Emergency Department (ED)	2015	1) Time from ED arrival to evaluation by physician 2) Time from ED arrival to antibiotic administration 3) Time from ED arrival to IV fluid administration	Decrease time from ED arrival to: 1) evaluation by physician 2) antibiotic administration 3) IV fluid administration	Effective	None	Analyze	Project discontinued	Project discontinued	Proposed education of triage RNs on screening for sepsis and sending lactate for screen positive patients never implemented.
Improving the timeliness of care for patients with neurologic conditions presenting in the ED	2015	1) LOS for admitted patients 2) LOS for ED discharged patients	Reduce ED neurologic patient LOS by 25%	Efficient, Patient Centered	<ul style="list-style-type: none"> Policy to initiate consult prior to return of lab/CT results Avoid MRI in ED if nonurgent Clinical pathway for vertigo 	Improve – no results at end of AQSI	Project discontinued	Project discontinued	Additional barrier felt to be variation in admission approval among neurology attendings. Revisions to inpatient service ongoing.
Reducing inappropriate use of continuous telemetry (tele) monitoring on inpatient medical services	2015	1) ED wait time for tele bed requests 2) Days with ≤2 tele boxes available	1) 10% decrease in ED wait time for tele bed requests 2) 10% decrease in days with ≤2 tele boxes available	Timely, Patient Centered	<ul style="list-style-type: none"> Revised tele orders requiring indication EHR reminder to discontinue tele if indication was acute coronary syndrome (ACS) and patient has 2 normal troponins 	Improve – no results at end of AQSI	Goals met	Sustained	Team discovered ACS was indication for 33% of patients and tele often remained on patients long after troponins returned as normal.
Improving the second opinion process at the Lynn Sage Breast Center	2015	Nursing phone calls for arranging second opinions for patients with a breast concerns	1) Decrease nursing phone calls for arranging second opinions 2) Increase patient satisfaction scores	Timely, Patient Centered	<ul style="list-style-type: none"> Updated patient education materials Created 2nd opinion welcome video Created EPIC second opinion tracking system / flow sheet 	Improve – 1) decreased RN phone calls by 70%, 2) patient satisfaction improved (see comment)	Goals met	Sustained	Overall patient satisfaction for the Breast Center improved, but the team has not separated out results for 2 nd opinion patents.
Improving management of tobacco dependence for hospitalized medical patients	2015	1) Percentage of tobacco users prescribed nicotine replacement therapy (NRT) 2) Percentage of tobacco users prescribed NRT on discharge	Increase percentage of tobacco users prescribed NRT during hospitalization and at discharge by 50%	Effective	<ul style="list-style-type: none"> Updated nicotine replacement order set New patient education materials (triggered from NRT order set?) 	Improve – NRT during hospitalization increased from 22% to 48%. NRT at discharge (19%) did not change.	NRT during hospitalization sustained	NRT during hospitalization sustained	No further interventions conducted to address NRT at discharge.
Standardization of sedation usage post-intubation in the ED and continuing to the MICU	2015	1) Percentage of benzodiazepine (BZD) infusions 2) Percentage of patients with Richmond Agitation Sedation Scale (RASS) levels ≤3	1) 50% reduction in BZD infusions 2) 25% Reduction in patients with RASS levels ≤3	Effective, Safe	<ul style="list-style-type: none"> Creation of ED post-intubation order set suggesting propofol and fentanyl or BZD boluses rather than BZD infusions Order set also included ED RN alerts to reassess RASS q30' 	Control - 1) BZD infusions declined from 49% to 19% 2) RASS -3 to -5 declined from 84% to 71%	Results not available	Results not available	Interventions remain in place. Updated data analysis not performed, partly due to departure of team leader.

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Decreasing the incidence of catheter-acquired urinary tract infections (CAUTI) in surgical patients	2015	Rate of CAUTI	Decrease rate of CAUTIs by 50%	Safe	<ul style="list-style-type: none"> Policy that all catheters to be inserted with 2-person technique Operating room (OR) staff address catheter necessity with surgeon prior to end of surgery. 	Control - Decreased CAUTI's by 65%	Sustained	Sustained	Project focused on OR urinary catheters and complemented other CAUTI efforts. Catheter utilization in OR declined.
Proper utilization of blood cultures in the ED and appropriate use of re-culturing on general medicine service	2016	Blood cultures utilization patients with pneumonia (PNA), urinary tract infection (UTI), or cellulitis	Reduction in blood cultures for CAP, UTI and cellulitis by 50%	Efficient. Effective	<ul style="list-style-type: none"> Revised blood culture order set with decision support Education provided to ED physicians, hospitalists, and residents 	Improve – no results at end of AQSI	Results not available	Results not available	Project eventually merged with hospital-wide antimicrobial stewardship efforts.
Improving vaccination practices for heart transplant candidates	2016	<ol style="list-style-type: none"> Percentage of transplant candidates who complete hepatitis B (HB) vaccine series Percentage who receive pneumococcal vaccine 	<ol style="list-style-type: none"> Achieve 80% HB vaccine series completion Achieve 80% receipt of pneumococcal vaccine 	Effective	<ul style="list-style-type: none"> Prospective vaccine appointment scheduling Vaccine cards given to patients Stocked HB vaccine in cardiology clinic 	Improve - 50% on schedule for HB vaccination; 80% received pneumococcal vaccination	Results not available	Results not available	Interventions remain in place, but vaccination completion rate not reassessed.
Increasing access to living donor kidney transplantation	2016	<ol style="list-style-type: none"> Days in evaluation Donor patient satisfaction 	<ol style="list-style-type: none"> Decrease kidney living donor evaluation time Improve patient satisfaction 	Timely, Patient Centered	<ul style="list-style-type: none"> Redesign living donor evaluation to complete all clinical components on 1 day Revised tracking report for living donor with weekly contact with donor 	Improve – no results at end of AQSI	Days in evaluation declined from 130 to 70 days. Patient satisfaction improved (see comment)	Results not available	Overall patient satisfaction for the clinic improved, but the team did not separated out satisfaction for kidney donors.
Implementing enhanced recovery protocols (ERP) for patients undergoing bowel resection	2016	LOS, cost, patient satisfaction	<ol style="list-style-type: none"> Decrease mean LOS by 1 day Compliance with ERP protocols at 50% by 2016 Q3, 75% by Q4 	Efficient, Effective	<ul style="list-style-type: none"> Revised pre-, intra-, and post-operative order sets Created patient education material Developed on-line training for surgeons, anesthesiologists and nurses 	Improve – no results at end of AQSI	Compliance with ERP protocols > 50%. No LOS data available.	LOS reduced by 1 day ERP protocol compliance >90%	30 day readmission reduced by 40% Wound infection rates reduced by 40%
Improving patients' understanding of heart failure management at discharge	2016	Heart failure medication and nutrition knowledge assessed using the Atlanta Heart Failure Knowledge Test	Achieve 80% of patients with score 25/30 or higher on final knowledge assessment	Patient Centered	<ul style="list-style-type: none"> Heart failure nurse administered knowledge assessment pre-discharge and tailored education and referrals based on results 	Control - medication score increased from 69% to 85% and nutrition score increased from 68% to 88%.	Sustained	Sustained	Continuation of prior project efforts to improve transitions for heart failure patients.

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Ensuring guideline adherent treatment for skin and soft tissue infection	2016	1) Percentage patients receiving appropriate antibiotics on arrival based on IDSA guidelines and local resistance patterns 2) Median LOS for observation and inpatients.	1) Achieve 60% compliance with appropriate antibiotics 2) Reduce LOS for observation and inpatients	Effective, Efficient	<ul style="list-style-type: none"> Creation of ED and observation cellulitis order set with antibiotic decision support Education provided to ED physicians, hospitalists, and residents 	Control – 1) appropriate antibiotic use increased from 33% to 61% 2) Observation LOS increased from 28 to 38 hrs. inpatient LOS declined from 77 to 49 hrs.	Sustained	Sustained	Result mainly driven by improved antibiotic selection for non-purulent cellulitis. LOS result potentially explained by fewer patients converted to inpatient status.
More efficiently evaluate and care for patients with advanced lung disease referred for lung transplant evaluation	2016	Time of the transplant evaluation process from date of referral to final decision on candidacy for transplant	Achieve 40% reduction in time of the transplant evaluation process.	Timely, Patient Centered	<ul style="list-style-type: none"> Other specialist evaluations done in parallel instead of sequentially Created dedicated time slots for lung transplant patients referred to other specialists 	Control – Evaluation time declined from 63 days to 34 days (46% reduction) time	Sustained	Sustained	Improvement achieved despite increasing volume of referrals for lung transplantation.
Improving patient and healthcare worker safety	2017	Reports of physical and verbal assaults	Increase reporting of physical and verbal assaults by 10-20%	Safe	<ul style="list-style-type: none"> Creating one system for reporting Education of staff and incorporating workplace safety into new staff orientation 	Improve – no results at end of AQSI	Results not available	Not applicable	New process implemented for reconciling reports.
Improving understanding and adherence to cardiac medications for patients discharged with heart failure	2017	Rate of correct cardiac discharge medication adherence	Achieve 75% correct cardiac medication adherence	Patient Centered	<ul style="list-style-type: none"> Pharmacist education Medication chart created with pharmacist input 	Improve - Increased medication adherence from 44% to 66%	Processes remain in place, but adherence had not been reassessed	Not applicable	Statistically significant improvement in adherence at AQSI completion.
Improving end-of-life care for patients suffering from advanced lung disease with poor prognosis	2017	Number of advanced lung disease patients receiving end of life care on dedicated pulmonary intermediate care unit rather than MICU	Increase the number of hospital deaths on pulmonary unit rather than in MICU	Patient Centered	<ul style="list-style-type: none"> Created end of life order set Nurse and physician education, emphasizing use of appropriate tools for symptom assessment Lower nurse: patient ratio for actively dying patients 	Improve – increased number of patients per month receiving end of life care on pulmonary unit from 4 per month to 8 per month, rather than in MICU	Sustained	Not applicable	Prior to project, nurses and residents expressed lack of confidence with end of life care for this population. Post-intervention survey underway.
Implementing daily spontaneous awakening trials for patients on continuous sedatives while mechanically ventilated in the MICU	2017	Percentage compliance with Spontaneous Awakening Trial (SAT) Screening	1) Achieve 100% patients screened for SAT 2) Achieve 95% receive SAT if indicated	Effective	<ul style="list-style-type: none"> Revised order sets to automated daily SAT safety screen Prompt for nurse to hold sedation if patient passes SAT safety screen 	Improve - Increased compliance with SAT screen from 30% to 70%	SAT screen performance sustained	Not applicable	SATs performed on 65.1% of all patients at 6 month post AQSI.
Improving evaluation of patients with a head injury and clinical suspicion for a concussion who present to the ED	2017	1) Percent concussion patients who complete follow up appointment 2) Percentage of patients with return ED visit	1) Achieve 20% follow up rate 2) Achieve < 5% return ED visit	Effective	<ul style="list-style-type: none"> Incorporated concussion assessment into workflow ED physician education Improved concussion discharge instructions Improved access to sports medicine 	Control – 1) Increased follow up rate from 8.6% to 22.2% 2) Decreased ED returns from 7.5% to <5%	Follow up rate declined to 13.1%. ED return visit remains <5%.	Not applicable	Future plans to transition from paper-based concussion assessment to electronic health record-based assessment.
Better identification of frailty among elderly trauma surgery patients and implementation of interventions to improve their outcome	2017	1) LOS for frail trauma patients 2) 30-day readmission rate for frail trauma patients	1) Reduce LOS by 10% 2) Reduce 30-day readmissions	Efficient, Effective	<ul style="list-style-type: none"> Frailty screen for patients > 65 yrs. old Order set for frail patients for hospitalist, social work, physical and occupational therapy consults 	Control – 1) Reduced mean LOS from 16 to 10 days 2) Reduced 30-day readmissions from 36% to 14%	Sustained	Not applicable	Project team now assessing feasibility of expanding screening and intervention pathway to geriatric patients on other surgical services.