

Mustafa RA, Gillenwater K, Miller SK, Aly A, Pamulapati H, Sifers TM, et al. QIPS CURE: implementing the quality improvement and patient safety curriculum and resident experience. *J Grad Med Educ.* 2020;12(4):469–477.

Supplemental Material

Scoping Review

We started in 2014 by assessing the status of QIPS curricula in other programs. Five internal medicine residents (SM, AA, HP, TS, DN) along with faculty mentors (RAM) obtained a list of all ACGME accredited IM residency programs in the United States and systematically reviewed the websites of all 392 programs. Independent data abstractors assessed program websites that were identified as having a dedicated QIPS curriculum. With the aim of learning how others were complying with the ACGME requirements, we abstracted data about availability of QIPS curricula, curricular details, and availability or requirement of QIPS projects for graduation. This step aimed to explore the status of program compliance with ACGME rules regarding QIPS projects and how they achieved that requirement.

At the time of our review, 11 out of 392 IM residency programs had a defined QIPS curriculum on their website. In addition, 93 programs mentioned QIPS projects, of which 19 required a QIPS project before completing residency. Nine programs required completion of Institute for Healthcare Improvement (IHI) modules.

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TABLE

QIPS Curricular Goals, Methods of Achievement, and Advantages and Challenges

Curricular Goal	How it is achieved	Advantages	Challenges
Highlight importance of practice-based learning and improvement	Residents receive a summary of their own patient panel data ¹	Residents appraise and reflect on their personal data	Collecting accurate resident-level data
Highlight importance of systems-based practice	Participation in multidisciplinary QIPS projects requiring coordination and collaboration with a variety of stakeholders	Teamwork and improved understanding of the healthcare system	Getting residents to realize the need to identify and involve all stakeholders early in project development
Place patients' needs and safety at the center of the care process and educational activities	Review M&M cases; conduct a mock RCA of a sentinel event; log a mock PSE in the electronic reporting system	Change perception among residents about the complexity and the amount of time required to submit a PSE	A mock RCA/PSE may not have as much impact as a personally experienced adverse event
Work as part of an interdisciplinary team and align projects with hospital priorities	QI department personnel give input into project selection and attend didactic sessions	Learn importance of collaboration to success of projects.	Can be challenging to find available time for all parties to meet.
Learn skills to plan and complete a performance improvement project	QI project: Each resident helps design and implement a QIPS project annually	Active learning allows residents to apply QIPS principles into practice	Limited time frame, varied participation among group members
Gain foundational QIPS knowledge	Methods of Improvement: IHI open school basic certificate	Easily accessible and flexible scheduling allowing for a "flipped classroom"	Learners may be less engaged than with an in-person presentation
Build a scholarly skillset	Submit protocols for IRB approval; Present QIPS projects at conferences	Learn skills translatable to future projects	May have limited number of faculty with QIPS skills

¹ Data includes outpatient and inpatient quality indicators and is received on a quarterly to annual basis for all residents

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Use best evidence to inform outcomes and goals of QIPS projects	Use evidence synthesis and clinical practice guidelines to inform proposed interventions	Learn to identify key components in the planning stages that lead to successful projects	If insufficient evidence to support their idea, residents sometimes had to change the proposal
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Project Proposal Worksheet



Performance Improvement

Division/Department:		Date Scheduled to Report:	
<input type="checkbox"/> LW <input type="checkbox"/> HH <input type="checkbox"/> Corporate			
Project Title:		Reporting Body	
<input type="checkbox"/> Clinical <input type="checkbox"/> Operational <input type="checkbox"/> 90-day Action Plan		<input type="checkbox"/> Quality Oversight Committee <input type="checkbox"/> Clinical Quality Committee <input type="checkbox"/> Other _____	
Consulting Black Belt:		Date Reviewed by Black Belt:	
Project Team Leader:		Date Submitted to Quality Resources:	
Other Departments Involved:			
Project Team Members:			
Division Administrator Approval:		Date:	
Problem Statement (Provide a brief definition of the problem and the results or risk to the organization if not done) <i>Example: Sutures are not always available when needed resulting in delayed patient care and dissatisfaction for surgeons and staff.</i>			

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<p>Goals (Describe what you hope to accomplish) Use SMART Goals: Specific (What, Why, How) Measurable Attainable Realistic Timely <i>Example: Sutures will be available in Pyxis when needed 95% of the time</i></p>																														
<p>Project Scope (Describe where the process currently begins and ends)</p>																														
<p>Key Performance Indicators Metric that will be monitored (KPI), Current/Baseline data, Benchmark data/Best Practices, and/or Customer Expectation For example: KPI=Suture availability Baseline=25% Benchmark=95%</p>	<table border="1"> <thead> <tr> <th data-bbox="680 516 1171 565">KPI</th> <th data-bbox="1171 516 1411 565">Current (Baseline)</th> <th data-bbox="1411 516 1696 565">Benchmark/Best Practice</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	KPI	Current (Baseline)	Benchmark/Best Practice																										
KPI	Current (Baseline)	Benchmark/Best Practice																												
<p>Process Owner(s) (Who is currently responsible for this process)</p>																														
<p>Project Cost (Potential Expenses including Resources, Equipment, Capital & Operational)</p>																														
<p>Impact (What strategic Business Priorities will be supported?) Check all that apply</p>	<p>Strategic Business Priorities</p> <p><input type="checkbox"/> Patient-Centered Care</p> <p><input type="checkbox"/> Service Line Development and Execution</p> <p><input type="checkbox"/> Chronic Disease Management/Primary Care</p>																													

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QIPS (Quality Improvement Patient Safety) Curriculum Survey

1. What is your PGY year?

Preliminary Resident
PGY 1- categorical
PGY 2-categorical
PGY 3-categorical
Other (please specify)

2. What is your gender?

Male
Female
Prefer not to answer

3. Where did you complete medical school training?

United States medical school graduate
International medical school graduate
Other (please specify)

4. I understand the basic approach to quality improvement/patient safety as it applies to problems in healthcare

Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree
Strongly Disagree

5. I am able to identify key stakeholders in a process that requires improvement

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Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree
Strongly Disagree

6. I am able to create a fishbone diagram to understand the root causes of a quality or safety problems

Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree
Strongly Disagree

7. I am able to create a SMART Aim (goal) statement

Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree
Strongly Disagree

8. I am able to design a Plan-Do-Study-Act cycle

Strongly Agree
Agree
Agree Somewhat

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Undecided
Disagree Somewhat
Disagree
Strongly Disagree

9. I am able to identify if a change led to improvement

Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree
Strongly Disagree

10. I am able to identify meaningful quality metrics for QI work

Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree
Strongly Disagree

11. I feel comfortable leading a QI project

Strongly Agree
Agree
Agree Somewhat
Undecided
Disagree Somewhat
Disagree

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Strongly Disagree

12. I am able to identify quality gaps within my own practice

Strongly Agree

Agree

Agree Somewhat

Undecided

Disagree Somewhat

Disagree

Strongly Disagree

13. I am able to log a patient safety event in the Hospital's incident reporting system.

Strongly Agree

Agree

Agree Somewhat

Undecided

Disagree Somewhat

Disagree

Strongly Disagree

14. I believe that the QIPS (Quality Improvement Patient Safety) Curriculum was a valuable learning experience

Strongly Agree

Agree

Agree Somewhat

Undecided

Disagree Somewhat

Disagree

Strongly Disagree

15. What part of the curriculum experience was the most useful to you?

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16. What did you learn from the QIPS (Quality Improvement Patient Safety) curriculum?

17. If you could change one thing about this curriculum, what would it be?

18. What challenges did you identify while working on your QI project?

19. How many patient safety events have you logged in the past year?

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TABLE
Summary of Completed Residents’ QIPS Projects

Cohorts ²	2014-2015	2015-2016	2016-2017	2017-2018
Cohort A	Medication reconciliation improvement in general medicine clinics	<i>Decreasing time to paracentesis in patients with ascites*</i>	Decreasing time to paracentesis in patients with ascites (PDSA cycle 2) ³	Increasing rates of line discontinuation on transfer out of ICU
		Guideline-based telemetry utilization	Guideline-based telemetry utilization (PDSA cycle 2) ⁴	Heart failure readmission reduction through automated education
Cohort B	Improving rates of health maintenance through optimization of the EMR’s adult health maintenance tab	<i>Improving rates of health maintenance through optimization of the EMR’s adult health maintenance tab (PDSA cycle 2)*</i>	Improving rates of health maintenance through optimization of the EMR’s adult health maintenance tab (PDSA cycle 3)	Improving resident clinic continuity
		Educational intervention to improve quality of colonoscopy preparation	Improving satisfaction for electrocardiogram reporting	Improving team communication via use of an EMR messaging app*
Cohort C	Increasing rates of ASA use for primary prevention	Lifestyle modification in prediabetes	Lifestyle modification in prediabetes (PDSA cycle 2) ⁵	<i>Improving IM resident confidence in running codes*</i>
		<i>Reducing phlebotomy among inpatients in an academic hospital*</i>	<i>Implementation of an in-clinic depression screening questionnaire*</i>	Elimination of contact precautions among patients with MRSA
Cohort D	Improving inpatient smoking cessation documentation	Establishing a standardized outpatient orderset for patients with CKD	Establishing a standardized outpatient orderset for patients with CKD (PDSA cycle 2)	Improving influenza vaccine rates in resident clinics

² Residents are divided into 5 separate cohorts, determined by their “+1” or ambulatory week in our 4+1 (X+Y) curriculum, during which they have protected time for QI sessions

³ Interdisciplinary team including Emergency Medicine physicians

⁴ Interdisciplinary team including nursing administration, director of telemetry units, IT

⁵ Project involved collaboration and coordination with community resources

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		Reducing night float pages through implementation of nursing protocols	Improving rates of 7-day follow-up following heart failure admissions	Improving medication reconciliation among ICU transfers
Cohort E	Standardizing clinic handoff documentation	Standardizing outpatient notes to improve adherence to quality measures	Standardizing outpatient notes to improve adherence to quality measures (PDSA cycle 2)	Increasing hepatology consults for inpatients testing positive for HCV
		Improving accuracy of recorded daily weights among hospitalized patients	<i>Improving compliance with enteric precautions for patients with C. diff infection*</i>	<i>Improving quality & quantity of smoking documentation*</i>
Group of the Affiliated tertiary hospital⁶	Improving documentation of cancer screening in primary care clinics	<i>(residents joined cohort projects after 1st year)</i>	<i>(residents joined cohort projects after 1st year)</i>	<i>(residents joined cohort projects after 1st year)</i>

⁶ Residents in this group had clinic at the same clinical site, but had asynchronous QIPS schedules spanning all 5 cohorts. This model was abandoned after the first year so that all group members working on a project were in the same cohort with simultaneous protected time.

*Presentation received an award at a regional meeting

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TABLE

Complete results of the qualitative analysis of resident comments

Themes	Examples of Resident Comments
What part of the curriculum experience was the most useful?	
Teamwork	<p>“Ability to see QI on a grand scale and interact with people outside of the immediate residency program”</p> <p>“The group discussion with the mentors and group members”</p>
Systems-Based Learning and Systems Thinking	<p>“Improved patient care involves changes in the system and not mere individuals “</p> <p>“How to identify issues within our system and create a project to address these issues”</p> <p>“Learned to identify system inadequacies and create a safe plan to address them through implementing safe alternatives”</p> <p>“The other stake holders [and] other clinical staff are as important in patient care”</p>
Leadership and Independence	<p>“Coordinating the teamwork”</p> <p>“Being able to create and carry out our own project”</p>
QI Principles and Knowledge	<p>“Monitoring quality measures after an intervention”</p> <p>“Basics behind the QI project, why we do it, how it is different from research”</p> <p>“PDSA, benchmark, important terminology and concepts”</p> <p>“A practical education of quality improvement was valuable to me. The QI curriculum taught residents not only the theoretic aspects of QI, but a hands-on education on how one may go about a QI project”</p> <p>“Identifying [the] problem and creating [a] fish bone to identify causative factors”</p>
Mentorship	<p>“Presence of faculty mentors at every meeting to add critical thinking and valuable input at important decision-making points”</p>
Patient-Centered Care	<p>“Interactive way in continuously improving the practice of patient care”</p> <p>“QI can improve patient care”</p>
First Hand Experience	<p>“Organizing and completing a project, including IRB approval, etc.”</p> <p>“Running the project and doing hands-on work”</p> <p>“Conducting the actual project was the most educational”</p>
What would you change about the curriculum? What challenges did you identify while working on your QI project?	
Team Management	<p>“Having the multidisciplinary teams involved in our project such as IT to provide us data in a timely fashion “</p> <p>“I feel we have too many projects going on at same time. It gets confusing for the other non-participating staff members to comply to all the changes within the short period of time”</p> <p>“It would be helpful to have an RSVP system so that all attendees are able to see other attendees prior to the meeting. This would help us determine areas of emphasis (IT vs statistics vs other).”</p>
Curriculum implementation	<p>“Didactic vs time on projects needs to be worked on without increasing the time outside of the QI sessions”</p> <p>“Getting early feedback regarding the feasibility of projects”</p>

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	“Working on QI in between session due to busy rotations”
Stakeholder Engagement	<p>“It should be a team effort, meaning if we are implementing something which might affect Nurses or MAs or ITs workflow, then ideally they should be part of the discussion team during the meeting, and their input will be valuable.”</p> <p>“More clearly identify and involve the administrative staff/stakeholders that we generally have no communication with/knowledge of - I think their involvement really helped to strengthen some of the projects.”</p> <p>“Involve hospital administration in the projects and ideas. This will help to tailor our projects with the hospital’s priorities.”</p> <p>“Involve the hospital QI team at early stages as they might be a great asset”</p> <p>“Too much reliance on IT intervention. Hard to schedule meetings and communicate between different departments”</p> <p>“Not all of the barriers to improvement are within our control to bypass”</p> <p>“Difficulty to get things done when it includes other departments and integrating forms into EMR”</p>