

Quality Improvement Models in Residency Programs

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The Accreditation Council for Graduate Medical Education (ACGME) sets standards on the integration of quality improvement (QI) activities into graduate medical education. The ACGME Common Program Requirements call for residents to engage in QI activities that institute systems-based changes as part of an interprofessional team.¹ The ACGME Clinical Learning Environment Review (CLER) program provides residency programs with periodic feedback on several areas, including QI activities.^{2,3} CLER's Pathways to Excellence document states that residents should be involved in a QI project that aligns with the clinical site's priorities and involves interprofessional teams.² ACGME requirements for family medicine, internal medicine, pediatrics, and general surgery contain similar language.

Reports in the literature suggest that residents often experience QI as isolated projects—separated in time and space from patient care activities—rather than as workflows that allow residents to simultaneously care for their patients and improve care overall.³ Resident QI projects may also be isolated from other health care professionals (eg, nurses and pharmacists) and from the QI efforts of the other clinic staff. Positive changes tend not to be sustained after the project.⁴ One article described negative resident attitudes toward QI, reflecting a separation between QI and patient care.⁵

A few case studies of resident QI innovations have appeared in the literature. For example, a group of academic institutions addressed the need for leadership to harmonize health system and graduate medical education priorities and to promote faculty development in QI.⁶ Other residency programs have created QI curricula.^{7,8} One program addressed the need to align QI projects with health system priorities and to ensure that the projects resulted in system improvement.⁹ Another academic center mapped the extent to which its affiliated residencies created experiential QI learning and offered support to lagging programs.¹⁰ However, a bigger picture provided by 2 cycles of CLER site visits suggested that most resident QI projects still fail to align with their clinical site's

priorities and a limited number of QI projects are performed with an interprofessional team.¹¹

This Perspective summarizes observations on resident QI by 2 project teams, the University of California San Francisco (UCSF) Center for Excellence in Primary Care and the University of Colorado Practice Innovation Program. The UCSF team conducted 44 site visits at family medicine and internal medicine residency clinics across the United States. Site visits included meetings with clinic leadership and residents and observation of patient care activities.¹² The Colorado team assisted 21 family medicine, internal medicine, and pediatrics residency clinics in patient-centered medical home adoption and advanced care model implementation.

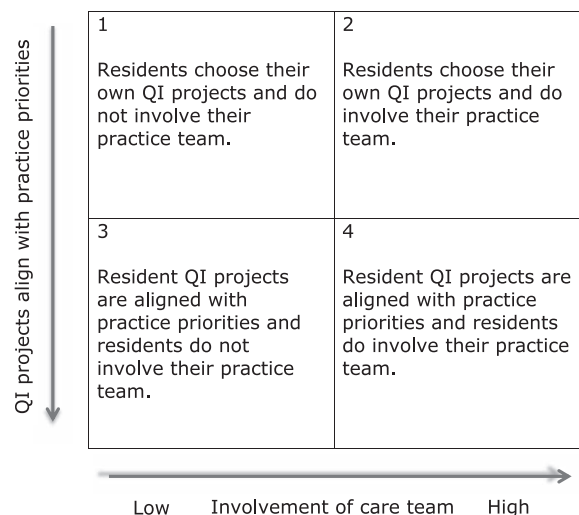
These 2 teams independently observed 4 models of resident QI projects that hinge on 2 factors: whether QI projects are aligned with clinic priorities and whether QI projects involve interprofessional teams (FIGURE). The models categorize resident QI projects as (1) low clinic priority/low team; (2) low clinic priority/high team; (3) high clinic priority/low team; and (4) high clinic priority/high team. The fourth model is most in line with ACGME requirements—resident QI activities relating to clinic priorities and involving interprofessional teams. From our site visits, we provide some examples of residency clinics that fit into these 4 models.

Model 1: Low Clinic Priority/Low Team

In multiple residency programs, residents choose their own QI projects, regardless of whether they fit with the clinic's improvement priorities, and clinic staff are not involved. In those settings, few successful improvements are sustained. At one clinic, residents have little time to work on projects; they are expected to do project work on their own time. Deadlines often are pushed back due to lack of progress.

Model 2: Low Clinic Priority/High Team

A community health center associated with a family medicine residency program has staff participating in patient case conferences, which changes the

**FIGURE****Models of Resident Quality Improvement (QI) Projects**

discussion from pathophysiology to social determinants of health and care coordination. Residents choose their own QI projects, which are implemented along with clinic staff. As a faculty physician put it, “The focus shifted from, ‘Let’s get the MA [medical assistant] to do that,’ to ‘Let’s talk with our MAs and all work together toward a solution.’” Because of staff engagement, the clinic has sustained improvements after residents graduate.

Model 3: High Clinic Priority/Low Team

In an internal medicine program, residents choose group QI projects from a list of clinic priorities.

TABLE**Resources and Steps Needed to Achieve Model 4**

Models	Resources and Steps
Model 1	- Leadership has not set clinic quality goals; thus, QI projects are not aligned with clinic priorities. - To solve this, leaders could set a few clinic quality goals each year. - Teams are not effective so interprofessional QI is difficult to organize. - To solve this, programs could gradually start interprofessional QI by pairing residents with a pharmacist, nurse, or social worker.
Model 2	- This clinic has a strong culture of interprofessional care. - It is natural for resident QI projects to involve other team members. - The clinic has a strong belief in resident autonomy. - Thus, leaders do not require residents to adopt QI projects aligned with clinic priorities.
Model 3	- Leaders have aligned resident QI projects with clinic priorities. - This clinic has a low staff-to-clinician ratio. - With few support staff, it is not feasible to involve staff in QI. - To solve this problem, residents could collaborate with another clinic professional (eg, pharmacist, nurse, social worker).
Model 4	- These clinics are overall high-performing clinics. - They can serve as exemplars for clinics in models 1 to 3. - To achieve Model 4 requires leadership engaged in the operation of the clinic and effective team-based care.

Abbreviation: QI, quality improvement.

Integrating frontline staff into QI projects has been a challenge, given short-staffing and lack of protected time for staff to work on QI.

Deciding whether to implement models 1 or 3 in a family medicine residency program, residents initially chose multiple small QI projects, which did little to improve clinic functioning. Leaders then started requiring residents to pick projects related to a single clinic priority. Residents complained about the lack of topic choices, but a compromise was reached so residents could choose from 12 priority improvement areas. Teams were not involved.

Model 4: High Clinic Priority/High Team

In an internal medicine residency program, leaders set 5 QI projects each year. Residents break up into teams to work on 1 of the 5 projects with nurses on their care team. Residents commented that they were taking a leadership role in developing, implementing, and testing their projects. There is a palpable energy and excitement about the improvement process among the residents.

In a family medicine program, residents are given a list of quality metrics where performance is below target. As a group they pick 1 metric—for example colorectal cancer screening—and all residents work on that project for a year with their care teams. Each year, the project results in major improvements in the target metric. Two years after the colorectal cancer project, screening rates continue to improve.

In another family medicine program, residents are part of interprofessional clinical teams that meet

every other week for ongoing QI. Residents are provided designated time to engage in those meetings and have input into the selection of topics. Upper-level residents assist a designated staff person within each team as the co-lead for team meetings. At a yearly forum, residents present results from their projects, some of which were created over the course of many years. Improvements resulting from these projects are almost always sustained. Residents are positive about the results from their involvement, noting improved understanding of the work and functioning of the clinic. Comments on these examples are provided in the TABLE.

In conclusion, residency programs may utilize the models summarized in the FIGURE to self-assess their adherence to ACGME requirements for resident QI projects. Model 4 is best aligned with the requirements that resident QI projects focus on clinic priorities and are performed with an interprofessional team. These requirements aim to graduate physicians who view QI as an integral part of their patient care in a team setting.

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