Providing Educational Content and Context for Training the Next Generation of Physicians in Quality Improvement

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Abstract

Amid calls for graduate medical education (GME) reform and growing recognition of how residents and fellows can impact health care quality and cost, institutions must find ways to more effectively educate and engage housestaff in quality improvement (QI) initiatives. Although the benefits for trainees and institutions alike can be significant, creating and maintaining successful strategies has proven challenging. Multiple barriers (e.g., variable backgrounds and needs of trainees) have clouded the educational and clinical effectiveness of many efforts. Recent findings suggest that trainee engagement in QI is lacking and that contextual support for practice-based learning and systems-based practice is often suboptimal.

Meaningful GME reform must include changes in how institutions approach QI education, particularly in how they create appropriate learning environments for trainees. Institutions can achieve these goals and foster a positive QI culture by aligning housestaff QI teaching with institutional priorities in several ways. First, they can create common, institutional-level QI curricula to standardize expectations for learners across training levels and specialties. Second, they can engage housestaff in ongoing institutional QI efforts by encouraging these trainees to develop and execute QI projects or assemble QI-focused groups that include faculty and institutional leaders. Third, institutions can appoint housestaff to institutional QI committees and have housestaff groups review and endorse proposed QI initiatives to enhance operational decision making. Institutions can leverage the new Accreditation Council for Graduate Medical Education Clinical Learning Environment Review program to implement these strategies, measure progress, and realize important gains in housestaff QI education.

Calls for graduate medical education (GME) reform and growing recognition of how residents and fellows can impact the quality of care have converged to strengthen the imperative to better educate and engage housestaff in quality improvement (QI) efforts.1

The Accreditation Council for Graduate Medical Education (ACGME) and other organizations have formalized the need for QI training in GME by requiring the teaching and assessment of competencies such as “practice-based learning and improvement,” “systems-based practice,” and the provision of high-value, cost-conscious care.2,3 More recently, the ACGME has implemented milestones-based assessments, including those related to the provision of high-quality care.3 It has also initiated the Clinical Learning Environment Review (CLER) program to help determine what institutional attributes and characteristics optimize the clinical learning environment, including those that foster both QI education and housestaff integration in care improvement efforts.4

Effective integration of housestaff in QI can provide vital benefits to trainees and sponsoring institutions alike. These benefits include preparing housestaff for practice environments that are increasingly marked by performance measurement and quality-based reimbursement and empowering frontline clinicians to help improve clinical processes. Unfortunately, many institutions have not yet meaningfully involved housestaff in their QI efforts.5 Although initiatives to educate housestaff about QI have increased over time, approaches vary greatly, and much more work is needed to understand their educational and clinical effectiveness.6 Findings from early CLER assessments suggest that—despite prior calls for GME reform around QI education—overall trainee engagement in QI is lacking and contextual support for “systems-based practice” is often suboptimal.7

We believe, especially given the recent debates about significant GME reform, that there has never been a greater need for institutions to improve curricula and contextual support for QI education. Current literature suggests that despite existing educational efforts, trainees are not appropriately prepared for contemporary medical practice, and several groups have urged Medicare to introduce performance and outcomes metrics into GME payment structures.8–10 Further, a recent report from the Institute of Medicine calls for GME funding to reward programs that train housestaff with competencies such as resource utilization and QI.11 Regardless of whether such proposals are enacted, these reports signal the urgency to produce a workforce that is better equipped to address national issues of health care quality and cost.

Collectively, these developments suggest that meaningful improvements...
in GME, and the future workforce it produces, must include enhancements to QI education, particularly in how institutions create the necessary environment and support for trainees to learn and practice effective QI. Although individual institutions will encounter unique challenges, we believe that there are also many promising and common opportunities for QI teaching and training.

**Persistent Challenges in Housestaff QI Education**

Although our experience at Brigham and Women’s Hospital suggests that growing numbers of trainees are interested in QI, individual skills, specialty-specific clinical backgrounds, and career goals vary greatly among housestaff. Although ACGME milestones–based assessments may help address this variability over time, differences among trainees nevertheless pose a crucial obstacle to curricular design. This challenge coincides with other well-known practical limitations, such as lack of time, continuously rotating schedules, and already-crowded GME curricula. Housestaff in different training programs may have fundamentally different experiences. Procedural and nonprocedural specialties often emphasize different QI skills and methods (e.g., QI initiatives in the surgical specialties may emphasize technical expertise more than those in the medical specialties, which may, in turn, have a greater focus on longitudinal chronic disease management). Specialties also differ in respect to staffing requirements and trainee access to QI resources.

Other challenges may arise from the diversity of residents’ career goals. Although core training is needed for all housestaff, most of whom will likely pursue careers centered around clinical care, research, or health policy, some trainees may desire careers that include significant QI responsibilities (e.g., department-level or institutional quality officer). Those pursuing QI-focused careers will likely require additional tailored training (e.g., project experience, mentorship, fellowship) that others may not. Faculty, training programs, and institutions provide additional sources of variation. Faculty instructors may have different levels of expertise in QI, whereas program directors may differ in their willingness to dedicate limited curricular time to housestaff QI work. Institutional characteristics—for example, the size and type of clinical sites, the case mix, the presence of electronic medical records, and the QI culture—also significantly affect learning environments.

Although these barriers have been recognized for some time, they remain widespread and difficult to address. One reason may be that housestaff QI training is frequently separate from larger institutional QI training and operations, a factor particularly relevant to the need for better contextual support around QI. Specifically, educational QI efforts are commonly designed and implemented independently for GME trainees (e.g., within individual residency programs), and these efforts often use materials that are different from those used to train institutional practitioners and leaders, which, in our experience, often involve more real-world projects. As a result, compared with faculty, housestaff may receive more abstract, generic exposure to QI concepts and underappreciate its practical applications and context.

Another explanation for the persistent challenge of incorporating QI in GME is that institutions still need to build stronger cultures around QI. Although housestaff represent a large portion of the clinical workforce, they are subject to strong forces within traditional medical hierarchies, particularly from their clinical supervisors. Messages transmitted through the hidden curriculum can also negatively affect learners and promote unprofessional or unsafe behavior (e.g., not speaking up about medical errors), and housestaff can easily become discouraged if some faculty and institutional leaders support QI but others model contrary behaviors and attitudes.

Collectively, these challenges suggest that one-size-fits-all solutions will likely fail. To be effective, educational initiatives must align with institutional training and decision-making priorities while supporting institutional culture around QI. Solutions must be embedded in institutional, clinical, and cultural contexts. Specific strategies include creating a common institutional QI curriculum with related competencies, engaging trainees in the development and execution of institutional QI efforts, and developing avenues for integrating housestaff into operational decision making (see Table 1).

**Creating Common Core Training**

One important step in creating effective learning environments is developing common—not necessarily identical—QI training through a core set of materials and resources. Many existing curricula have been created for specific subgroups of trainees and, as a result, are limited by variable teaching strategies, incomplete topic coverage, and suboptimal methodological rigor. Even longitudinal experiences at institutions with long-standing commitment to QI may be geared specifically toward individual “trainees interested in making quality and safety a central theme in their careers.”

Programs could address these limitations by developing institution-wide resources that establish a common institutional knowledge base and a toolbox of common teaching strategies applicable to all learners. Such resources will likely increase in number and quality as more institutions prepare their staff clinicians to maintain clinical certification and ready their leaders to meet the challenges related to payment and care delivery reform. Additional opportunities are emerging through novel institutional efforts to integrate QI into continuing medical education and to collaborate with professional societies on faculty development in QI.

Educators could capitalize on these existing resources and innovations by adapting standing curricula (e.g., training material already developed for institutional leaders or practitioners) or working closely with institutional leaders to codevelop curricula from more generally available resources (e.g., the Institute for Healthcare Improvement Open School modules or the American College of Medical Quality).

Because many QI faculty development programs are still in the early stages of development, and because housestaff can be only as proficient as those who teach them, institutions have a unique opportunity to bring together housestaff, faculty, leaders, and other stakeholders from the outset to codevelop...
In care.23,24 Engaging all groups, including residency, to further drive improvements higher-level QI milestones during physicians who have previously achieved residents and clinical fellows, young the expertise and perspective of chief programs could also capitalize on and allow for diverse clinical experiences. knowledge to all trainees, but respect training would impart foundational knowledge base of institutional advance institutional QI culture but also the resulting material would not only diverse group of institutional members, may overwhelm as much as help. We are working to streamline and align housestaff QI education with institutional efforts by encouraging residents to complete institution-wide “Lean process” training, an approach that others have piloted with success. We have also recently convened an institution-wide task force that consists of educators, leaders, and housestaff to further identify how clinical faculty can better teach core concepts in line with executive- and faculty-level QI educational initiatives.

### Engaging Housestaff in Institutional QI Initiatives
Beyond simply developing or improving core training, educators can build greater contextual support for QI education by integrating housestaff into ongoing institutional QI efforts. Integrating trainees can be achieved in part by connecting them to discrete portions of existing QI activities. Housestaff are extremely busy, so some may benefit more from becoming involved in segments of current projects rather than devising their own, which can be time intensive. Additionally, new projects may conflict with institutional foci, whereas standing or current QI projects reflect institutional priorities. Further, as exemplified by early examples, manageable time commitments and clear institutional support may increase buy-in from program directors concerned about the already-limited work hours available for educating trainees and supporting care delivery.

Another way to involve housestaff in institutional QI efforts is through the creation of housestaff-led “quality councils” or QI-focused groups consisting of housestaff, faculty, and organizational leaders. Councils can take on QI issues that are too large in scope for individual training programs (e.g., reducing hospital-wide central-line-associated bloodstream infections). They can also take advantage of existing platforms, such as morbidity and mortality conferences or interdisciplinary rounds, to maximize existing curricular time, clinical

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<th>Strategy</th>
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<td>Create a common base of institutional knowledge</td>
<td>Adapt existing non-HS curricula to HS learners; bring HS together with faculty and leaders to create a common knowledge base from generally available materials; select local case studies that highlight general principles; emphasize cases that involve multiple specialties or teams</td>
<td>Adapt executive “Lean Six Sigma” training into housestaff curriculum; apply IHOS module on local case involving RCA</td>
<td>Communicates that HS are stakeholders in creating common organizational QI curricula; conveys that core material is pertinent both during and after GME training; focuses required training on clinically relevant topics</td>
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<td>Engage HS in institutional and HS-specific QI initiatives</td>
<td>Engage HS in existing projects; create HS-led QI councils; provide support for HS-led QI innovations; establish collaboration across clinical sites or institutions to pool resources and share institutional lessons</td>
<td>“Plug HS into” existing team working on catheter-associated infections; assign HS specific roles and deliverables on Lab Draw Error Committee; charge the HSQC with specific institutional QI project; solicit and fund interdisciplinary HS-led projects; create regional consortia of like-minded HS groups</td>
<td>Communicates that HS are integral team members on QI initiatives; establishes formal pathway for HS involvement (not haphazard, not just in case-by-case situations); combats blame-based culture by providing collective HS “voice” on QI issues; allows HS to meet and encourage other like-minded HS; champions interdisciplinary, team-based nature of QI; establishes that QI activities can impart useful professional skills</td>
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<td>Integrate HS into institutional decision making</td>
<td>Appoint HS liaisons to independent QI committees; establish consultative role for HS groups (e.g., HSQC councils)</td>
<td>Assign HS to “Culture of Safety Committee” to communicate issues and opinions between committee and HS; dedicate HSQC meeting time to reviewing and giving feedback about QI efforts to leaders of institutional initiatives</td>
<td>Increases awareness and communication about relevant QI issues; collects important HS perspectives on new QI initiatives</td>
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Abbreviations: HS indicates housestaff; IHOS, Institute for Healthcare Improvement Open School; RCA, root cause analysis; QI, quality improvement; GME, graduate medical education; HSQC, Housestaff Safety & Quality Council.
relevance, and housestaff participation. Results from early examples have been encouraging,27 and a growing number of institutions appear to be assembling similar groups to help advance institutional QI agendas.

Our own experience with the housestaff-led, hospital-wide Housestaff Safety & Quality Council (HSQC) has been similarly positive. By including trainees from over 15 specialties, as well as institutional leaders (i.e., the chief medical officer, the designated institutional official, and an institutional-level quality officer), the HSQC connects learners to hospital-level projects and supports housestaff QI innovations that align with institutional priorities. Ongoing projects include efforts related to organizational culture (e.g., improving the culture of safety), cost and care processes (e.g., reducing the use of routine chest x-rays in the intensive care unit), and outcomes (e.g., preventing deep vein thromboses). Going forward, the HSQC itself will spearhead projects that engage large, interdisciplinary teams (e.g., collaboration between housestaff and nurses; efforts that require teamwork from residents in different specialties) to extend efforts beyond departmental boundaries and ensure that housestaff from smaller programs, or programs with fewer resources, can interface with colleagues from a diversity of backgrounds.

As a result of the CLER program, organizations of all sizes and cultures will more actively evaluate how their housestaff experientially participate in institutional QI.4 For some institutions, additional progress may be found beyond institutional walls. For example, our HSQC joined housestaff councils from several other local institutions to form a city-wide consortium for the purpose of sharing lessons and increasing exposure to QI work at different institutions. Similarly, our HSQC leaders have also begun exploring the possibility of strengthening local QI networks by engaging residents located across different training sites within our institution. These types of collaborative activities—that is, reaching out to housestaff and faculty at neighboring institutions as well as within one’s own institution—can be particularly beneficial for smaller training sites or sites with fewer resources that want to engage their housestaff in institutional QI work.

As new strategies are implemented, however, educators must be mindful of their potential unintended consequences. For example, novel programs that successfully engage large numbers of housestaff by financially rewarding them for QI involvement28 may inadvertently communicate the broad message that QI is worthwhile more as an income source than an intrinsically valuable activity. Conversely, institutions must be careful not to stunt innovation in QI education by overprotecting against all perceived dangers. With more time and experience with the CLER focus areas, institutions should be able to identify and promote the strategies that most positively affect both practical engagement and QI culture.29

Integrating Housestaff Into Organizational Decision Making

QI training and project experience will be the most impactful if housestaff are also integrated into institutional decision making around designing and prioritizing QI initiatives.

Involving residents in decision making can be accomplished effectively at both the individual and group level. Individual trainees can be appointed to independent QI committees as liaisons who represent housestaff, in part by taking responsibility for bidirectional communication between committee leaders and affected housestaff groups. Such integration also allows for training differentiation beyond core organizational curricula. For example, housestaff who desire to become QI specialists can take on roles that require them to work with and emulate institutional quality officers, whereas those who want to pursue careers in clinical operations or management could select experiences that expose them to the work of hospital executives.

At our institution, housestaff appointees to the Patient Safety Culture Committee played an important role in championing committee priorities to trainees while relaying to the committee unique housestaff concerns and insights about proposed changes. Other residents have similarly gained more specialized, career-specific experiences by working with senior leaders who have similar career interests. Some have helped faculty and executives on other committees overcome significant barriers by providing actionable insights into point-of-care processes (e.g., identifying key steps in value-mapping exercises or important causative factors in root cause analyses).

GME trainees can also be integrated into the decision-making process by providing an important consultative role to the larger organization. For example, housestaff on the HSQC have been able to spend a portion of some HSQC meetings hearing from hospital or committee leaders about proposed or upcoming QI and care delivery efforts (e.g., implementing a new electronic medical record, operationalizing new QI initiatives) and providing feedback on proposed strategies. By asking leaders of organizational initiatives to present and act on feedback from the HSQC—just as they would with faculty, nursing, or pharmacy groups—our institutional leaders have conveyed the importance of housestaff as overall QI stakeholders.

The Role of the CLER Program in Overcoming Long-Standing Barriers

Although existing approaches for teaching housestaff about QI have strengths, they have also been met by significant challenges, particularly in providing trainees with contextual support for QI education. Recently, several new incentives—arising from broad GME reform, faculty development, and institutional imperatives around quality and cost—have created opportunities for overcoming long-standing barriers.

Although by no means a solution unto itself, the new CLER program represents an important opportunity. By organizing QI efforts within distinct pathways (e.g., resident and fellow engagement in planning for QI), CLER provides a framework that can help institutions better direct their educational energy. By evaluating perceptions of learning environments, it helps define and quantify the most pressing problems at hand. By focusing evaluation on the degree of housestaff integration into institutional work (e.g., measuring whether or how housestaff are “aligned and integrated” with clinical site priorities), it aspires to an appropriate goal.

To prove helpful over time, however, the program must adapt to meet changing learner and institutional needs. By
evolving over time—as it is explicitly designed to do—CLER can help institutions learn from one another and design learning environments that improve both educational outcomes and quality of care. As institutions implement effective strategies for integrating housestaff in QI work, CLER reviews should increasingly reflect how often, and to what extent, housestaff input actually improves care processes.

CLER must also be applied and interpreted in view of other external drivers of QI education and engagement. Explicit focus on institutional culture around CLER focus areas is crucial. As institutions increase faculty and leadership development programs, CLER measures should account for, if not complement, evaluations of nonhousestaff learners.

To train a workforce that can improve the quality of health care, it is critical to meaningfully engage the next generation of physicians in QI. This training will require education, engagement, and ultimately, positive feedback loops that convey that housestaff input is valued on an institutional level. Because institutions cannot improve what they do not measure, the CLER program represents a framework and impetus for implementing strategies that increase resident engagement and for realizing important, long-delayed gains in housestaff QI education.

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