Improvement in Context: Exploring Aims, Improvement Priorities, and Environmental Considerations in a National Sample of Programs Using “Small Data”

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ABSTRACT

Background In 2013, the Accreditation Council for Graduate Medical Education (ACGME) transitioned into a new accreditation system to reduce burden, focus on outcomes, and promote innovation and improvement. One component is a self-study that includes aims, an environmental assessment, and setting improvement priorities. The ACGME initiated voluntary site visits following the self-study.

Objective We explored common themes in program aims and assessment of their environment.

Methods Using grounded theory, inductive and deductive qualitative methods, and truth grounding, we analyzed data from voluntary site visits of 396 core and subspecialty programs between June 2015 and September 2017, with a focus on common themes.

Results We report common themes for aims and the dimensions of the environmental assessment. Themes for *strengths* include a collegial, supportive learning environment; responsive leaders; and experiences that prepare residents for unsupervised practice. *Improvement priorities* encompass low learner engagement and “content mismatch” in didactic education, balancing education and service at a time of growing clinical volumes, and improving the utility of assessment systems. Common *opportunities* encompass collaborations that improve education, involving alumni and harnessing technology to enrich education, while *threats* include an unsustainable effort for many program leaders, clinical pressures on faculty, and loss of external sites important for education. Linked dimensions of the environmental assessment suggest benefit in a growing focus on learners, and approaches to ensure a humanistic learning environment that allows for growth, self-determination, and inclusion.

Conclusions The findings highlight actionable themes for the environmental assessment. We discuss implications for programs, institutions, and the ACGME.

Introduction

The Accreditation Council for Graduate Medical Education (ACGME) introduced the Next Accreditation System (NAS) in 2012 to reduce burden, enhance the focus on educational outcomes, and promote innovation and improvement.¹ As the ACGME reduced its focus on documentation and minor problems, many citations from the previous accreditation system were removed, and most programs on

Continued Accreditation now have no or very few citations.² A key consideration for the new system became how to facilitate improvement in these programs, as the ACGME program requirements are minimum standards, and cannot be used as performance excellence criteria. The approach chosen was to have programs set aims and conduct an environmental assessment focusing on strengths, underperforming areas, opportunities, and threats.^{3,4} Programs would select improvement priorities that related to their aims and fit well with their environment.

There is a need for information on how residency and fellowship program leaders differentiate a given program from others in the same specialties, and how this type of “intentional design” may contribute to

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graduates with capabilities and skills better aligned with health care system and community needs.⁵ While the literature contains descriptions of program improvement,^{6,7} including improvement in the new accreditation system,⁸ to our knowledge no studies have analyzed how aims are used to generate improvement priorities for programs that comply with the accreditation standards.

We hypothesized that open-ended conversations during nonaccreditation site visits could identify links between program aims, related improvement priorities, and programs' perceptions of their environment. This information has not been collected in the accreditation process to date, and has the potential to offer guidance to programs seeking to make improvements, as well as improve the relevance of accreditation.

Methods

Our analysis focused on ACGME-accredited core and subspecialty programs on Continued Accreditation scheduled for an early self-study in the new accreditation system. Eligible programs were notified through their ACGME self-study initiation letter. Site visits were confidential, with verbal and written feedback shared only with program and institutional leaders, and programs were informed that only aggregated, deidentified information would be disseminated. Programs volunteered by contacting ACGME staff listed in the letter and staff members provided clarifying information, but did not encourage or discourage participation. The ACGME did not follow up with nonresponders.

Between June 2015 and September 2017, participating programs underwent voluntary non-accreditation site visits that lasted 3 to 5 hours, and encompassed separate semistructured interviews with program and institutional leaders, trainees, faculty, and program coordinators. Site visitors reviewed self-study summaries prepared by programs, resident and faculty consensus lists on strengths and improvement opportunities, and selected accreditation data. Site visitors had received additional training on the self-study and approaches to promote open-ended interviewing. The Self-Study Summary (BOX 1) was used to structure the interviews, and for data aggregation and reporting. Interview questions were modestly revised based on feedback from site visitors and participants. In 2017, a "pilot within the pilot," was conducted jointly with the American College of Surgeons (ACS) representatives, to gather data regarding concerns about surgical trainee preparedness for practice,⁹ and assessed surgical resident readiness for unsupervised

BOX 1 Self-Study Summary Elements and Pilot Interview Domains

1. Program Aims
2. Activities in Furtherance of the Aims
3. Environmental Analysis (Strengths, Improvement Priorities, External Opportunities, and Threats)
4. Self-Study and Program Improvement Process
5. Key Trends and Developments
6. What Will Take This Program to the Next Level?
7. Program Learning From the Self-Study
8. Learning for the ACGME

practice in a small sample of surgery residency programs.

Data Collection and Analysis

Data collected were qualitative, and were extracted from self-study summaries, feedback reports, and field notes. Data from the ACGME Resident¹⁰ and Faculty surveys were used to provide independent corroboration of selected information ("ground truth"¹¹). ACGME staff were not involved in the site visits extracted and aggregated the data. The analysis focused on accredited programs, with data collected as part of an experimental site visit approach. Interview participants and programs were not identified, and the study was deemed not to require Institutional Review Board review.

Deidentified data were analyzed using NVivo 11.0 software (QSR International, Melbourne, Australia) using grounded theory,¹² and in keeping with recommendations for the use of program evaluation data for qualitative research.¹³ Two authors (I.P. and S.M.) created the primary coding structure, which consisted of an initial open coding scheme that was iteratively applied to new data, and was revised as dictated by the new data. Using constant comparison, we analyzed the data inductively and deductively to assess whether information from earlier site visits corroborated themes identified later in this longitudinal study, and used axial coding to explore relationships among coded areas. We achieved thematic saturation, and in September 2017, the data underwent axial coding to generate the final themes and subthemes.

Throughout the study period, we collected verbal and written feedback from participating programs, with the aim of correcting errors and misinterpretations, and to serve as primary member checking to promote data accuracy and validity.¹⁴ Members of the research team also presented selected findings to multiple stakeholder groups. The complex and

cross-specialty nature of the data precluded a process of formal member checking to validate or amend the draft findings.

Results

Our thematic analysis is based on 396 programs in nearly all accredited core specialties and many subspecialties. While qualitative analysis generally does not concern itself with sampling considerations inherent in quantitative methods, the sample represents 22% of the approximately 1800 accredited programs that were due to submit their self-study during the study period. Due to the timing of data collection, the number of NAS Phase I programs (emergency medicine, internal medicine, neurological surgery, orthopaedic surgery, pediatrics, diagnostic radiology, and urology, and their subspecialties) scheduled for a self-study was greater, and significantly more Phase I programs participated in the pilot visits. Themes consistently appeared across Phase I and II programs, and across surgical, medical, and hospital-based specialties. The majority of programs had no or very few citations, and the sample contained no programs on Probationary Accreditation, and only 3 programs on Accreditation with Warning (all in subspecialties). A small number of currently “troubled” programs participated, and were predominantly “volunteered” by institutional graduate medical education (GME) leaders. No common themes emerged from these lower-performing programs, and site visitors focused on providing real-time, actionable suggestions for improvement verbally and in writing to these programs.

We report findings by theme and, in keeping with accepted practice for qualitative analysis, we do not report data on frequency. Other than program aims, we provide no illustrative quotes, to maintain a focus on cross-specialty priorities versus the priorities of individual “representative” programs.

Themes for Program Aims

The most common explicit theme in aims, present across nearly all programs, is a focus on the attainment of competence for unsupervised practice at the completion of training. Other common aims included traits and skills of graduates, attributes of individuals recruited into programs, service to specific communities, preparing trainees for academic, research, or leadership roles, and for some programs, attributes of the learning environment. Examples for all are shown in BOX 2.

As our question framework asked programs to link aims and their environmental assessment, programs commonly discussed activities in furtherance of the

aims under the dimensions of the environmental assessment, and we present the information in this fashion.

Themes for the Dimensions of the Environmental Assessment

Themes for the dimensions of the environmental assessment are shown in BOX 3. The exploration of themes and subthemes revealed 3 subthemes that are highly relevant to the performance of educational programs, which emerged under 2 or more dimensions of the environmental assessment, and are discussed in more detail below.

The first linked subtheme concerned the human relationships in the learning environment. Under strengths, trainees commonly mentioned the collegial and supportive program environment, mentioning relationships with classmates, more senior residents, faculty, and program leadership. Trainees commonly spoke about the pivotal role played by senior residents, and even more so, their program director, and the relationship with these leaders was highly motivating. Programs with this positive interpersonal environment also often involved and empowered senior residents, with a resulting gain in competence, confidence, and stature. At the same time, program directors in many of these programs devoted many hours to the program, often exceeding a “normal” work commitment. Thus, the toll of maintaining this degree of interpersonal involvement also emerged under the threats theme, as an effort that appears unsustainable for these individuals in the longer term. Associate program directors often were less engaged, with the central role of the program director potentially a barrier to greater involvement. In addition, these highly committed leaders often lacked succession or contingency plans in case of retirement, illness, or transfer to another role.

The second linked subtheme—supervision, delegated authority, and progressive responsibility—emerged under 4 themes. It appeared in 2 strength themes: (1) focus on preparing residents for unsupervised practice, and (2) attributes of a collegial and supportive learning environment. It also appeared under improvement priorities as gaps in the assessment system, which provided insufficient data to support entrustment¹⁵ decisions. Finally, it appeared under the threats theme of reduced faculty time for education and exposure to residents, where interviews noted growth in faculty, reduced continuity between residents and faculty, and recruitment of physicians who lack a deep interest in education. Members of this “more casual,” noncore faculty tended to oversupervise intermediate and senior residents, due to their

Box 2 Themes in Program Aims and Sample Text**Competence/Preparation for Practice in the Chosen Clinical Specialty**

Train surgeons of outstanding ability and judgment who will be leaders in their area of interest and in the setting of their choice.

Train the internists of the future as leaders in exemplary evidence-based clinical medicine, population health, and team-based collaborative care.

Train diverse individuals to become competent pediatricians committed to providing excellent medical care to infants, children, and adolescents, and to be advocates to the children and their families in terms of social, emotional, and medical needs.

Prepare fellows to be intelligent, fiscally minded, careful, and technically superb pain practitioners anywhere in the world.

Resident/Graduate Traits

Develop mindfulness, curiosity, patient advocacy, and a commitment to lifelong learning, while being adaptable to future changes in our health care system.

Encourage trainees to cultivate an attitude of scholarship and dedication to continuing education that will remain with them throughout their professional careers.

Develop physicians who demonstrate the core values of our profession, specifically excellence, collaboration, respect, and compassion.

Encourage independent and creative thought, and interactions with patients and families that are compassionate, communicative, and respectful of culture.

Attributes of Individuals Recruited

Recruit the most curious, compassionate candidates who have demonstrated a strong work ethic, leadership, and exceptional interprofessional skills.

Attract applicants with a proven record of academic success, research experience, and leadership experience.

Recruit diverse candidates with an emphasis on giving opportunities to students who have a track record of overcoming barriers, and the potential to excel in terms of physician competencies, advocacy, and leadership.

Service to the Local or Other Specific Communities

Build a strong program that recruits fellows who will help replace [the state's] aging neonatology workforce.

Train outstanding primary care, board-certified pediatricians prepared to enter a practice serving a rural population with limited access to tertiary or quaternary care.

Serve our surrounding community in a culturally competent manner; the program aims to recruit residents who reflect the diversity of the population it serves.

Specific Academic Practice/Research/Leadership Roles

Recruit and train fellows with a long-term focus on staying in academics.

Recruit clinically minded trainees with academic inclinations who will pursue lifelong self-education and possess a willingness to educate others throughout their careers.

Train the next generation of leaders in academic pulmonary and critical care medicine.

Produce physician-scientists.

Attributes of the Program and Its Learning Environment

Provide a culture that is supportive, respectful, and compassionate toward trainees, patients, and colleagues.

Provide a learning environment that promotes residents' professional and personal development.

sporadic contact and reduced understanding of their capabilities, and out of concern for patient safety. Program leaders independently expressed concerns about faculty "competence" to provide appropriate autonomy at later stages of training (in addition to reimbursement systems that encourage over-supervision). In contrast, more junior residents expressed concerns about undersupervision, particularly at critical junctures of training, such as when a "newly minted" second-year resident is expected to supervise even more junior learners. Concern about over- and undersupervision emerged across specialties.

A third linked set of subthemes concerned core residents' exposure to generalist teaching and experiences. Didactic content emerged as an asset in programs that reported preparing residents for independent practice as a strength. It also emerged as an improvement priority in other programs, with residents commenting on the need for more core- and board certification-focused content, and reporting that too many lectures cover subspecialty faculty members' esoteric areas of interest. Core program leadership mentioned interest in reducing resident coverage of subspecialty areas not relevant for core

Box 3 Cross-Specialty Themes in the Environmental Assessment**Strengths**

- A collegial, supportive program-level learning environment, encompassing trainees and faculty
- Responsive, engaged program leaders, committed to ongoing program improvement and to the success of trainees
- Core curricula and experiences tailored to prepare graduating residents for unsupervised practice in the core specialty or for fellowship

Improvement Priorities

- Addressing the lack of appeal, low learner engagement, and “content mismatch” in didactic sessions
- Maintaining a balance of education and service at a time of rapidly growing service volume
- Improving the assessment system and the value and relevance of feedback, including feedback to faculty on their roles in the educational program

Opportunities

- For fellowship programs, expanding collaborations and partnerships that enhance clinical experiences or increase research opportunities
- Involving alumni in resident education as preceptors, to advise programs on curriculum and related matters, and capitalizing their clinical, health policy, and advocacy leadership roles
- Capitalizing on technology, including simulation, online learning, and in some sites, information gleaned from the electronic health record, to enhance and extend the learning experience for trainees

Threats

- Program directors’ significant time commitment, and lack of succession, transition, and contingency planning for these roles
- Increasing clinical pressures on faculty, accompanied by reduced reimbursement for services, and resultant loss of faculty time for education, supervision, and mentoring
- For core programs, loss or impending loss of community, ambulatory, and other sites due to retirement of community physicians, clinical sites starting their own residency programs, or participating sites entering larger networks that do not support an educational mission

specialty competence, but reported competing priorities with department and institutional leaders’ desire for resident coverage of inpatient units. Core programs where education to produce competent physicians was a strength appeared more successful in navigating these competing interests, due to more senior program leadership, department leadership that valued generalist education, and the availability of generalist faculty role models. Collectively, these attributes allowed some programs to tailor educational experiences highly relevant to achieving competence in the general specialty.

Differing Educational Environments for Core and Subspecialty Programs

Our data suggest the educational environment differs for core and subspecialty programs, particularly regarding relationships with external clinical sites. For many subspecialty programs, the external environment offered opportunities for collaborations to enhance fellows’ clinical and research experience, including opportunities to follow the development of new knowledge from “the bench to the bedside.” In contrast, programs in some medical subspecialties appeared to languish, citing a combination of low interest by fellowship applicants, difficulty obtaining training grants for research requirements, and a sense of being dissociated from rewarding and valued activities available in their core program and/or sponsoring institution.

Many core programs saw a threat in the loss or impending loss of community sites that had traditionally provided for ambulatory education and “bread and butter” inpatient and procedural experiences. Reasons for this included these sites starting their own residency programs, being absorbed into larger systems that did not see value in an educational mission, or the retirement of practitioners who had served as preceptors. To compensate, some programs have reached out to local and regional networks of alumni. Initiatives include alumni serving as clinical preceptors, mentoring trainees, educating them about “business of medicine” topics, and facilitating transition into practice. Some programs have asked alumni for input into curricula and learning experiences.

Discussion

The themes emerged from open discussions that ensued during nonaccreditation pilot site visits. Our title uses the term “small data,” as much pertinent information was gathered from the free-text comments in programs’ self-study summaries, and from the open-ended interviews during site visits. The term “small data” was made familiar by Martin Lindstrom, a Danish researcher, who used observations from living with families to get insights into how they interacted with consumer goods, to complement the “big data” generated from individuals’ commercial transactions.¹⁶ Our analog to Lindstrom’s findings is that open conversations during site visits highlight aspects of program’s improvement priorities, and their interactions with the environment offer useful guidance to the larger community. These data have not been captured in existing requirements and problem-focused accreditation site visits.

The findings around supervision and progressive authority and responsibility suggest a need for

gradual, monitored increases in trainee responsibilities, paired with stepwise reductions in what trainees perceive as the “standard” level of supervision, with added “case level” modifications for trainee ability and patient complexity. Residency is the period in physicians’ educational trajectory when the learning accomplishment is greatest.¹⁷ While survey research has identified patient preferences, liability concerns, and payment policies as barriers to resident autonomy,¹⁸ our findings suggest discontinuity of faculty-trainee contact and lack of assessment data that facilitate entrustment decisions as the most significant barrier to progressive autonomy and responsibility. This barrier is internal to the program, which suggests that as faculty numbers increase, basic faculty development related to supervision and entrustment is essential. There also is a need for a robust assessment system that provides data on trainee competence on which faculty may base defensible entrustment decisions. Despite significant progress with the educational milestones, such data do not yet exist. The problem may be circular. The fragmented nature of faculty-trainee contact itself is a barrier to meaningful work-based assessment.^{19,20} Finally, research suggests that when trainees perceive too little or too much autonomy, this adds stress and hampers their learning.²¹

Related to resident well-being, the attributes of the beneficial collegial and humanistic learning environments were distinct from programs’ focus on resident and faculty well-being. While residents appreciated efforts to implement wellness programs, many are in the planning stages, and residents expressed concerns regarding how these offerings will fit into their busy schedules. Some participants viewed them as a resource for residents in obvious distress, or with performance or mental health issues, in contrast as a resource to be broadly accessed by trainees and faculty.

While the focus on resident well-being has resulted in new attention to personal characteristics, there has been less consideration of individual attributes in the design of didactic and experiential learning to match them with learner characteristics, and learning styles and preferences. Future work could explore characteristics such as self-reliance, resilience, and mental self-governance, and how these could be used to optimize learning. Relevant theories include prior work around aspects of performance that are independent of task-specific knowledge,²² research on mental self-governance,²³ and self-determination theory that sees competence, autonomy, and relatedness as attributes of environments that foster well-being.²⁴ In our interviews, residents emphasized that opportunities to use their skills and abilities, meaning

derived from work, and having input into efforts to improve their learning environment collectively gave them a sense of *worth* and *control*. This reduced stress and anxiety in even the most taxing aspects of their education. Some of these principles are congruent with the aims of the ACGME Council of Review Committee Residents’ “Back to Bedside” initiative.²⁵

Work to improve the science of learning is aligned with the extension of Boyer’s principles,²⁶ by Healy, and includes research on improving learning, along with work to improve teaching.²⁷ Interviews with surgical chief residents as part of the “pilot within the pilot” suggested residents near the completion of training have considerable meta-cognitive skills,²⁸ which allowed them to self-assess their competence, confidence, and safety in performing less common procedures. Meta-cognition can be explicitly taught.²⁹ At the program level, a focus on meta-cognition may allow learners to increase their capacity for “learning about learning.” In the future, a focus on residents’ understanding of their own learning could be part of standard curricula.

Learning for Programs and the ACGME

Learning for programs and the ACGME highlights the power of aims in identifying areas for improvement in programs on Continued Accreditation, with the domains identified in our analysis relevant for individual programs and at the national level. There are 5 focal areas for programs and sponsoring institutions interested in improving the learning environment:

1. Attention to how curricula, clinical experiences, didactic education, and the assessment system collectively contribute toward readiness for unsupervised practice in the given specialty.
2. Shifting the focus from transmitting knowledge and skills to individual residents’ learning and professional development, with attention to learning style, career aspirations, and progress in the program. This could incorporate a focus on residents’ meta-cognition about their learning.
3. Attention to individual faculty members and their development needs related to their role in supervising trainees, including providing them with data to make appropriate entrustment decisions.
4. Attention to the learning environment and the general attributes that promote or reduce resident and faculty well-being, and ability to focus on their learning and professional tasks (as a separate focus in addition to implementing wellness programs).

FIGURE
Interconnected Elements for Review During the 10-Year Accreditation Site Visit

5. Addressing tensions between program, department, and institutional priorities through attention to opportunities for cooperation and collaboration across groups and units with potential affinities, and efforts to harmonize program, department, and institutional priorities.

Learning for the ACGME focuses on interconnected themes as focal areas for the 10-Year Accreditation Site Visit, and work to further enhance the relevance and utility of the information collected during accreditation site visits:

1. A more holistic approach to program review through open-ended dialogue during accreditation site visits, including identification of common concerns within and across program communities that could be relevant to the accreditation process, and identifying program attributes that may indicate underperformance and are not included in the current ACGME screening data.
2. Focus on 3 interlinked concepts that emerged as core attributes of high-performing learning environments (FIGURE) for use in structuring interviews during 10-Year Accreditation Site Visits, and with further work on assessing validity and utility.
3. Exploration of metrics for the attributes of the learning environment, for use by programs in self-assessments, in enhancing sponsoring

institution oversight, and once fully validated, in ACGME surveys and screening activities.

Our study has limitations. Qualitative data are always subject to interpretation, and while we sought feedback on aspects of our findings, we did not conduct a full member check that gave stakeholders the opportunity to revise or amend findings. The desire to make the self-study outcomes “actionable” at program and institutional levels may have led to underrepresentation of environmental factors that cannot be influenced by programs and institutions, such as the impending threat to the support of GME through Medicare and Medicaid.

Conclusion

This multi-program, cross-specialty analysis offers the GME community and the ACGME insight into aims and related attributes of the environment for accredited programs. The results are of use to programs by identifying key attributes of program improvement—for the ACGME, they suggest accreditation site visits should foster generative dialogue. There is benefit in more explicit focus on trainees’ learning experience to optimize their learning. This is particularly important given the multiple competing demands and constraints on residents’ time and energy during this most intense phase of their professional development. Attending to these attributes of the learning environment has the potential to move resident education from its rootedness in 19th-century principles to the 21st century.

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