A Novel Core Competencies-Based Academic Medicine Curriculum: Description and Preliminary Results

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Original Article
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Abstract

Background: Physicians practice health care in a rapidly changing system that requires more than the delivery of safe and effective care. Modern physicians must also acquire skills beyond direct patient care. Residency programs must, therefore, prepare physicians to meet these demands by providing appropriate education and training.

Methods: We designed, implemented and assessed an academic medicine curriculum in the first post-graduate year. This curriculum provides comprehensive exposure to necessary non-patient contact related physician skills. Topics centered around four domains: critical appraisal of literature of literature, quality improvement, professional development, and teaching. Each of these domains is linked to the six core competencies established by the Accreditation Council for Graduate Medical Education's (ACGME). Instruction includes small-group learning sessions with additional time for self-directed online modules and a faculty-mentored quality improvement research project that is presented at a graduation symposium. All residents completed a survey evaluation of the curriculum before and after the course via open-ended questions and Likert responses (0-5). We assessed improvement in resident confidence with each curricular domain using mean Likert score change and 95% confidence intervals (CI).

Results: Residents improved at all curricular domains measured. The most significant mean changes included confidence in: poster presentations (2.7; 95% CI: 1.9-3.5), plan-do-check-act cycle (2.5; 95% CI: 2.1-2.9), quality improvement projects (2.4; 95% CI: 1.9-2.9), and abstract presentation (2.3; 95% CI: 1.6-3.0).

Conclusions: We found that the academic medicine rotation (AMR) is feasible in a large academic setting. Furthermore, the AMR allows early exposure to and improvement in essential non-patient contact related physician skills required by the ACGME core competencies and assessed through the milestones.

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Introduction

Due to the increasing complexity of health care delivery, the professional development of physicians should now include training in and acquisition of both clinical skills and skills beyond those involved in direct patient contact. These diverse skills are essential to practicing in our modern health care system. To ensure that residency programs are adequately training physicians to practice in this evolving environment, the Accreditation Council for Graduate Medical Education (ACGME) requires competency in six areas: patient care, medical knowledge, professionalism, interpersonal skills and communication, practice based learning and improvement, and systems based practice. Under the Next Accreditation System, these requirements will become even more specific with the implementation of specialty-defined milestones. While physician-training programs have always maintained a focus on patient care and obtaining medical knowledge, preparation relevant to the non-clinical competencies is under-emphasized in resident education.

The ACGME established the Outcome Project to ensure that the training requirements in the core competencies are being successfully met.[1] While there are accepted definitions for the core competencies, there is less agreement on how to effectively provide training that develops and ensures mastery in these areas.[2] Despite this disagreement, full exposure, teaching and proficiency in the competencies is expected by the Residency Review Committee. While many programs report success in the core competences using their own curriculums[3-8], our group made it a priority to develop and implement a more comprehensive curriculum that fully addressed all six competencies.

Many anesthesiology residency programs include an approved Clinical Base Year (CBY) at the same institution where the clinical anesthesia training occurs. The CBY is largely composed of required clinical experiences, but does include some opportunity for elective experiences. We designed, implemented and assessed a curriculum in the anesthesiology CBY that provides comprehensive exposure to necessary non-clinical physician skills. The curriculum is unique in providing this exposure early in training and in a concentrated, uninterrupted fashion. The Academic Medicine Rotation (AMR) curriculum lasts five weeks in the winter of the CBY. The AMR centers around four domains: critical appraisal of literature, quality improvement, professional development, and teaching. All curricular activities in the AMR are linked to one or more of the ACGME's six core competencies.

Early, intentional exposure to the full set of core competencies in an intense, immersive experience uninterrupted by clinical responsibility should contribute to the formation of a strong base for continued self-directed learning while helping to prepare physicians for leadership in the new era of health care.[9-11] This report describes the development of the AMR and details the lessons learned from the first three implementations of this novel CBY curriculum. In the future, we plan to examine whether establishing an environment of intellectual curiosity in the CBY increases the quantity and quality of resident scholarship over time.

Methods

This study was reviewed by the University of North Carolina's Institutional Review Board and was determined not to constitute the use of human subjects. Requirement for written consent was waived.

Needs Assessment and Approvals

To develop the new curriculum we first established baseline abilities and deficiencies to determine learner needs. We surveyed all Anesthesiology residents across several academic areas, including patient care, health care information literacy, teaching abilities, quality improvement project skills, the ability to practice evidence-based medicine, and profession-specific items including those related to reimbursement and health care reform. Assessment of residents prior to initiation of this curriculum identified gaps in knowledge across all training levels for the four domains. We obtained approval from the Designated Institutional Official (DIO), the Anesthesiology Residency Review Committee, and the American Board of Anesthesiologists (ABA) to implement a curriculum to address these knowledge gaps.

Overview of Curriculum

The AMR curriculum is organized around four major domains: critical appraisal of literature, quality improvement, professional development, and teaching. All six ACGME core competencies, as outlined by the ACGME Common Program Requirements for Graduate Medical Education[a], are incorporated in these four domains (Table 1). Titles of individual curriculum sessions are mapped to these domains in Table 2.

Table 1. ACGME Core Competencies and AMR Curriculum Domains

		ACGME Core Competency					
		Patient Care	Medical Knowledge	Practice Based Learning and Improvement	Systems Based Practice	Professionalism	Interpersonal Skills and Communications
D O M A I N	Critical appraisal of literature	x	x	x			
	Quality Improvement	x	x	x	x		x
	Teaching and Learning	x	x	x		x	x
	Professional Development				x	x	x

The ACGME Core Competencies mapped to the four AMR curricular domains.   Each domain addresses at least two competencies. ACGME = Accreditation Council for Graduate Medical Education

Table 2. AMR session topics mapped to the four curriculum domains.

Critical appraisal of literature	Professional Development
Asking a question and searching for answers	Myers-Briggs Type Indicator® (MBTI®) personality inventory and application
Cross sectional studies	Medical malpractice liability reform
Cohort studies	Understanding anesthesia billing
Health Science Library's anesthesiology guide	Accountable care organization
Case control studies	What is the North Carolina Medical Board?
Limitations to evidence based medicine	What is the North Carolina Society for Anesthesiology?
Searching for different study types	Common problems with the IRB process
Applying statistics in medicine	How to improve your public speaking
Writing an abstract	Lifelong learning in medicine and Maintenance of Certification in Anesthesiology (MOCA)
Systematic reviews and meta-analysis	Leadership series: persuasion and negotiation
What study type and when?	Planning your future as an anesthesiologist
Evidence based medicine and outcomes research	Leadership series: skills workshop
Randomized controlled clinical trials	Leadership series: conflict resolution in medical practice
Evidence based medicine: clinical	The value of anesthesiologists outside of

applications	clinical care
RefWorks, EndNote® or Mendeley	Walk through a malpractice case
Overview of research funding and grants	
Quality Improvement	**Teaching**
The science of quality improvement	Clinical teaching while you work
Prevention of surgical site infection	Simulation tools in anesthesia education
Overview of risk management	Social media in medical education
National surgical quality databases	The RIME (Reporter, Interpreter, Manager, Educator) framework
Health literacy and anesthesia consent	Preparing effective PowerPoint presentations
TeamSTEPPS® training	Designing a poster presentation
National anesthesia quality databases and incident reporting mechanisms	Optimizing problem based learning
Just culture and dealing with complications	Feedback in learning and teaching
Preparing a morbidity and mortality conference	Educational research
Designing and using surveys	

Titles of instructor-led individual sessions are mapped to the AMR curricular domains. IRB = Institutional Review Board.

Critical appraisal of literature

The critical appraisal of literature domain teaches residents how to find, interpret, organize, and apply relevant literature to Anesthesiology practice. The focus of this domain is on study design, statistical interpretation, content analysis, and searching the literature. We also include additional topics: bibliographic management tools, the limitations of evidence based medicine, writing an abstract, and an overview of grants and funding mechanisms. Weekly journal club meetings with a faculty member provide residents with an opportunity to apply what they are learning during the AMR instruction sessions. This domain supports practice-based learning by using information technology to identify and evaluate research evidence relevant to clinical questions. Thus, the critical appraisal of literature domain should improve the resident's ability to build medical knowledge and to apply this knowledge to patient care.

Quality improvement

The quality improvement domain introduces physician trainees to the science, methodology, and importance of quality improvement in clinical medicine. In addition to learning how to evaluate reported quality improvement initiatives, trainees learn to design and implement a quality improvement project. Quality improvement includes an understanding of quality databases, peer review, and risk management. The application of quality improvement is evidence of the systems based practice competency.

Professional development and advocacy

The professional development and advocacy domain provides a baseline of knowledge about topics that are not usually tested in the ABA certification process but are important for maximal functionality in the practice of medicine. A large section of this domain focuses on leadership skills and the expanding role of the anesthesiologist in systems based health care delivery. Included in this domain are: exposure to health care legislation, advocacy, economics, and malpractice. Interpersonal communication skills and learned techniques of leadership, conflict resolution, negotiation, and persuasion are central to professional success.

Teaching

The teaching domain focuses on improving our residents' skill sets to teach and to learn. There are sessions devoted to clinical teaching in the operating room, providing and receiving feedback, and facilitating problem-based learning sessions. The residents are exposed to education research and basic education theory. Presentation skills are emphasized and studied to enhance one-on-one communication. The residents also spend time learning how to present their work in the form of poster presentations, oral presentations, and written abstracts. This domain develops a solid foundation for the required resident teaching and evaluation skills mandated by the Accreditation Council for Graduate Medical Education. This domain supports the interpersonal and communication skills competency by providing techniques to share medical knowledge with learners.

Faculty

Identifying faculty with the required knowledge and with time to dedicate to teaching and mentoring residents can be a barrier to successful implementation of non-patient contact related programs.[10,12,13] AMR faculty include anesthesiologists, public health faculty and graduate students, health science librarians, Institutional Review Board (IRB) members, researchers, grant experts, legal staff, pediatricians, obstetricians, surgeons, and risk-managers. Each instructor was chosen based on demonstrated expertise in one of the domains. For the critical appraisal of literature domain, we partnered with a health science librarian experienced in working with our department. She determined session content and selected contributors to teach efficient utilization of medical informatics. Course content related to the study design portion of the critical appraisal of literature domain was developed and led by a primary care physician with an appointment in the Department of Epidemiology at the UNC School of Public Health and a doctoral student in epidemiology. We found significant faculty expertise within our department in quality improvement theory and practice. Sessions in the teaching domain were led by the course directors and residency training program directors from UNC. Many contributors in the professional development domain came from outside the institution. When considering developing a similar curriculum, the balance of course contributors will likely differ since departments and institutions have varying strengths and weaknesses.

Teaching and Learning Strategies

Time pressure has been identified as a barrier to successful implementation of research and core competency instruction.[10,12] A key element of the learning strategy of the AMR curriculum is that we offer the program in a concentrated time period during which the CBY residents have no clinical responsibilities. The residents can focus solely on the curriculum at hand without having to prioritize this learning with patient care duties.

The curriculum includes 60 hours of instructor led small-group learning sessions with the additional time dedicated to self-directed online modules (Institute for Health Care Improvement Open School courses http://www.ihi.org/offerings/ihiopenschool/Pages/default.aspx), and assigned background reading and research related to the capstone project. All instructors submit pre-session assignments. Interactive discussion-based rather than lecture-based teaching is encouraged. Small class size and intimate teaching allows all participants to actively engage in classroom discussions. The course management tool Sakai (http://www.sakaiproject.org/) is used to organize the schedule and to provide access to both background and presentation materials for all sessions. The residents maintain access to these online materials for the duration of their training program.

Demonstration of Skills Learned

In addition to the classroom-based and computer-based curriculum, each resident works with a faculty mentor to develop and complete a quality improvement project or evidence based literature review. These are modest projects that can be completed in one month. The goal of the capstone project is for residents to apply the skills they are learning in real time. The majority of our CBY residents chose to develop and implement a quality improvement project.

The rotation culminates with a graduation symposium at which each resident displays a poster and delivers a short oral presentation of their project. All anesthesiology department faculty and course contributors are invited to the symposium. The 2012 project titles are listed in Table 3.

Table 3. AMR Capstone Projects, 2012

Standardization of classification of electroconvulsive therapy patient using the American Society of Anesthesiologist Physical Status Classification System through educational intervention
Intravenous lipid emulsion for the treatment of local anesthetic toxicity: a literature review
Perioperative Information: are we adequately preparing our patients?
Effect of standardization of the post-operative process and patient interview in obstetric anesthesia
Retrospective review of peripheral nerve blocks
Effect of cooled radiofrequency ablation for sacroiliac joint pain
Factors perceived as stressful by US anesthesiology housestaff: a pilot study at the University of North Carolina
Bronchoscopy simulation: online learning tool vs. hands-on simulator
Assessment of a hands-on workshop for introduction to ultrasound guided peripheral intravenous access
Effect of an educational tutorial on laryngeal mask airway cuff pressures

Titles of AMR capstone projects completed by CBY residents for the 2012 rotation. Projects were quality improvement or evidence based reviews.

Results

Target Goals Achieved

The AMR curriculum has been used in dedicated five-week rotations running from mid-November to mid-December. We have data available for two iterations of the AMR course (2011-2012). These first implementations met the target goals for determining initial success of the AMR, as described next.

All invited contributors participated as planned and there were sufficient faculty volunteers from the department to mentor the capstone projects. Each cohort consisted of all ten residents pursuing a CBY at UNC that academic year. All residents in each cohort earned certificates of completion for fourteen online Institute for Health Care Improvement Open School courses. Achieving this certification is evidence of engagement in the computer-based learning modules. Project posters and oral presentations were of appropriate scope and demonstrated high quality, providing another indicator that the CBY residents used the self-directed time as planned to assimilate and apply what they were learning in the instructional sessions. The symposiums were well attended by course contributors, departmental faculty, and anesthesiology residents of all levels. The question and answer period following each presentation gave the CBY residents an opportunity to demonstrate learned communication skills, mastery of their quality improvement project or literature review topic, and to participate in interactive learning with the entire department, receiving immediate peer review and feedback from their colleagues.

Learner and Curriculum Evaluation

Several forms of evaluation were used throughout each AMR implementation. CBY residents completed daily online surveys evaluating the content, delivery, and relevance of every morning session. Course directors met weekly with the group to receive verbal feedback and to informally assess learner progress toward curriculum goals. At the end of the AMR the CBY residents completed an online survey evaluating the entire course including the graduation symposium. Anonymous session evaluations were sent to the instructors and were used to modify and improve session content, including removing or adding sessions, between the first and second implementations. For example, a detailed session on database searching to locate research funding was replaced with a more general overview of where to obtain assistance with identifying research funding sources.

Analysis of Learner Feedback

Feedback from the CBY residents on curricular design, implementation, and achievement of goals for the rotation was highly favorable in both years. The newness of the program and the small number of learners in each group prevents comprehensive statistical analysis of learner outcomes related to the core competencies. Selected comments from the surveys of individual sessions were mapped to the relevant core competencies in Table 4 as a demonstration of learner outcomes.

Table 4. Learner Feedback for AMR sessions mapped to ACGME core competencies.

Session	Comments	Competencies
Evidence based medicine application	good to hear about limitations of EBM…will be an influence for always questioning what I am doing in practice and why	PC, MK, SBP, PBLI
Health Science Library	learned a lot of new information… nice to walk through new tools	PC, MK, PBLI
Designing a poster	good to review what makes a poster effective and not effective.	MK, IPSC
Navigating the IRB	will make future research much easier to get done	SBP, PBLI, Pro
Optimizing problem based learning sessions	learning how to be a good facilitator will be very useful …great guidelines by which we can improve our own group interactions	MK, PBLI, IPSC
Smart searching based on study type	made progress in my database searching ability which was very weak coming into this course	PC, MK, SBP, PBLI
Case control studies	(presenter) is a true asset to this rotation…he keeps the learning manageable…his enthusiasm has become contagious in just the first week of working together	PC, MK, PBLI
Overview of risk management	answered a lot of questions that we all had about legal issues that no one is ever really straightforward about	PC, SBP, PBLI, IPSC, Pro
Feedback in	very helpful strategies to better govern our interactions as	PC, MK,

learning and teaching	student-teachers and provide constructive feedback	PBLI, IPSC
Personality inventory session	good to learn about how our own personality styles could work better with other personality types	IPSC, Pro
Social media in medical education	helpful information, we must emphasize awareness of this topic, both the dangers but also the strengths of social media in an anesthesiologist's career	PC, MK, SBP, PBLI, IPSC, Pro
The science of quality improvement in health care	very good introduction to lean six sigma and how quality improvement can improve workplace functioning and reduce errors. A fantastic foundation for understanding engineering side of quality improvement in the hospital	PC, MK, SBP, PBLI
Leadership workshop: Conflict resolution	enjoyed analyzing the conflicts in a systematic way… to really break it down helped to show where we can improve things	PC, SBP, PBLI, IPSC, Pro
Quality improvement projects	great insight into how Dr. X actually implements the Plan Do Study Act format in this hospital… inspiring to see that little changes over time really can have large effects on patient care	PC, MK, SBP, PBLI, IPSC
Anesthesiology quality databases	understanding quality databases and using them to their fullest benefit is a great way for anesthesiologists to shine	PC, MK, SBP, PBLI
MOCA and lifelong learning	Great for the perspective of our careers, which I believe is the best advantage we've gained from this rotation! Much easier working hard towards a goal when we much	PC, MK, SBP, PBLI, IPSC, Pro

	better understand what that goal actually is.	

Comments were selected from surveys of individual AMR sessions submitted by 2011 and 2012 CBY residents. ACGME = Accreditation Council for Graduate Medical Education; PC = Patient Care; MK = Medical Knowledge; SBP = Systems Based Practice; PBLI = Problem Based Learning and Improvement; Pro = Professionalism; IPSC = Interpersonal Skills and Communications, EBM = evidence based medicine, IRB = Institutional Review Board, MOCA = Maintenance of Certification in Anesthesiology.

Each 2012 learner responded on a five-point scale indicating comfort with each of the AMR curricular domains before and after completing the course. In the "Critical appraisal of literature" domain, the most significant improvements were seen in mean change in residence confidence for poster presentations (2.7; 95% CI: 1.9-3.5) and abstract presentations (2.3; 95% CI: 1.6-3.0). In the "Professional Development" domain, resident confidence was most significantly improved in comprehending billing in Anesthesiology (2.3; 95% CI: 1.6-3.0). Regarding the "Teaching Skills" domain, a significant change was seen in confidence to lead problem-based learning exercises (2.4; 95% CI: 1.7-3.1). Finally, in the "Quality Improvement" domain, residents confidence increased most for the "Plan-Do-Check-Act Cycle" (2.5; 95% CI: 2.1-2.9) and quality improve projects (2.4; 95% CI: 1.9-2.9). The descriptive statistics suggest improvement in understanding and working with all AMR curricular domains and the core competencies. Table 5 describes all pre and post survey results completed by the 2012 learners.

Table 5. Pre and Post AMR Survey for 2012 CBY Residents.

Critical appraisal of literature	Before AMR	After AMR	Improvement (95% Confidence Interval)	Professional Development	Before AMR	After AMR	Improvement (95% Confidence Interval)
Poster Presentations	1.7	4.4	2.7 (1.87 – 3.53)	Billing in Anesthesiology	1.1	3.4	2.3 (1.62 – 2.98)
Abstract Presentation	2.1	4.4	2.3 (1.62 – 2.98)	Maintenance of Certification	1.4	3.6	2.2 (1.46 – 2.94)
Evidence Based Medicine	2.4	4.2	1.8 (1.35 – 2.25)	Health Care Policy	1.6	3.3	1.7 (1.22 – 2.18)
Literature Search	2.6	4.6	2.0 (1.25 – 2.75)	Conflict Resolution	2.7	4.1	1.4 (0.63 – 2.17)
Study Design	2.3	4.0	1.7 (1.11 – 2.29)	Persuasion and Negotiation	2.8	4.0	1.2 (0.54 – 1.86)

Teaching Skills	Before AMR	After AMR	Improvement (95% Confidence Interval)	Quality Improvement	Before AMR	After AMR	Improvement (95% Confidence Interval)
Leading PBL Exercises	1.9	4.3	2.4 (1.71 – 3.09)	Plan-Do-Check-Act Cycle	1.2	3.7	2.5 (2.12 – 2.88)
Presentation Skills	2.9	4.5	1.6 (1.10 – 2.10)	Quality Improvement	1.3	3.7	2.4 (1.90 – 2.90)
PowerPoint Presentations	3.1	4.7	1.6 (1.00 – 2.20)	Presenting at M&M	1.3	3.6	2.3 (1.71 – 2.89)
Providing Feedback	2.3	3.8	1.5 (0.89 – 2.11)	Six Sigma	1.2	3.5	2.3 (1.62 – 2.98)
OR Teaching	2.2	3.6	1.4 (0.80 – 2.00)	Working with Databases	2.0	3.9	1.9 (1.19 – 2.61)

Follow-up survey from 2012 class (N = 10). Learners from the second AMR class provided their comfort level on a scale of 1 to 5 (5 being highest) in each of the curriculum domains before and after the AMR. Improvement indicates the difference between before and after results on the 1 to 5 scale (with 95% Confidence Intervals). PBL = Problem Based Learning; OR = Operating Room; M&M = Morbidity & Mortality

The impact of a comprehensive curriculum such as the AMR is difficult to quantify. Tetzlaff (2007) identifies that tying learning to a directly related task (our stated objective with the AMR capstone project), participating in peer review, and articulating reflective self-assessment are all "nontraditional assessment methods that stimulate learning."[2] We found these methods confirmed the success of the AMR.

Discussion

Related Anesthesiology Programs

The AMR is a novel rotation with significant merits that can be established in other anesthesiology core programs. When this new curriculum was designed in the summer of 2011, we identified only one anesthesiology training program with a comparable CBY innovation. The Department of Anesthesiology at the University of Michigan has a one month rotation, Fundamentals of Research, with a focus entirely on research. Our program expands this learning opportunity to include exposure to a broader array of non-clinical topics. Subsequent to the completion of the first implementation of our curriculum, the Department of Anesthesiology at Johns Hopkins University School of Medicine reported on their effort to enhance resident knowledge of the system based practice and practice based learning and improvement competencies. In this program, residents have protected time two days a month in each of the clinical anesthesia years. A didactic curriculum is provided during the protected time in the CA-1 year and capstone projects are pursued in CA-2 and CA-3 years.[7] There are interesting similarities between our two programs, but we remain committed to the benefit of providing an intensive curriculum in a block of dedicated time in the CBY. Our curriculum content and timing builds a strong foundation in the core competencies that can be further developed during the clinical anesthesia years.

Team Development

Our two groups of ten CBY residents spent five weeks learning together and working with one another. This led to a significant unanticipated outcome of the rotation. As the course progressed, we noticed more group participation and interaction. The individuals grew as a team and pushed each other to improve and succeed. In a typical CBY, and consistent with our experiences prior to the AMR, CBY residents have limited exposure to each other and almost no opportunities for team building. The residents in the CBY are all participating in different rotations, sometimes at different hospitals, and have limited time to share in learning experiences. This course brought cohesiveness to these anesthesia cohorts and was unintentionally a great team building experience. Although team development was not an intended benefit of this course, it is now considered a very important measure of course success.

Suggestions for Others and Lessons Learned

The themes of the curriculum can apply to all medical specialties with appropriate modification of the professional development section. There are obstacles to overcome to successfully initiate a curriculum such as the AMR. However with the right personnel and motivated expert session leaders, we believe this course can be reproduced and have a large impact on trainees while enhancing the academic profile of the resident training program. There are a few things that we believe optimized our success. We found core contributors from the School of Public Health and the Health Sciences Library who gave freely of their time and brought a unique expertise and enthusiasm to both planning the curriculum and implementation. Upon initial discussion of the AMR with our session leaders, many of them helped to recommend important topics for inclusion in the rotation and worked to identify experts to lead sessions. Although we are

fortunate to not be limited by available faculty contributors, this could easily be a significant challenge for other departments attempting to replicate this curriculum. Not all institutions have the support of a health sciences library or a school of public health. Institutions with these limitations could collaborate with other departments within or outside of their institution for certain sessions. Some sessions are amenable to web based modules or videotaped lectures. If this is the route to be taken, it is extremely important to maintain the group dynamic of the students. As previously discussed, one of the major benefits of the course was the team dynamic that developed throughout the course. We argue this is only possible by utilizing small group discussions as the *primary* teaching method.

Approval from the institution and the department are also of vital importance. During the AMR, CBY residents are not participating in patient care in the health care system. This shifts the patient care workload in our off-service CBY rotations to the host service. This must be acknowledged ahead of time.

Conclusions

We believe that focused comprehensive instruction of academic medicine topics centered on the ACGME core competencies in the CBY will increase the residents' academic medicine confidence and productivity over time. Early immersion into the full range of competencies will strengthen the development of anesthesia consultants and aid in differentiating them from other anesthesia providers. Our cohorts of recent medical school graduates identified weaknesses in the domains of critical appraisal of literature, quality improvement, teaching, and professional development. Future work will investigate if this curriculum, with total focus on project development and non-patient contact related skills acquisition, will help our CBY residents be more academically minded leaders in our field on the local, regional, and national level.

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