GME Concentrations: A Collaborative Interdisciplinary Approach to Learner-Driven Education

Alisa Nagler, EdD, JD
Saumil M. Chudgar, MD, MS
Mariah Rudd, BS
Shari A. Whicker, EdD, MEd
Jane P. Gagliardi, MD, MHS
Aditee Narayan, MD, MPH
Mitchell T. Heflin, MD, MHS
David C. Gordon, MD
Kathryn M. Andolsek, MD, MPH

ABSTRACT

Background Graduate medical education (GME) programs may struggle to provide the knowledge, skills, and experiences necessary to meet trainee career interests and goals beyond a clinical focus. Sponsoring institutions can partner with programs to deliver content not included in typical clinical experiences of GME programs.

Objective To perform a needs assessment and to develop, implement, and measure acceptability and feasibility of an institution-wide GME Concentrations curriculum.

Methods In response to the needs assessment, GME leadership developed 4 concentrations: (1) Resident-as-Teacher; (2) Patient Safety and Quality Improvement; (3) Law, Ethics, and Health Policy; and (4) Leaders in Medicine. We formed advisory committees that developed curricula for each concentration, including didactics, experiential learning, and individual project mentoring. Participants completed pre- and postassessments. We assessed feasibility and evaluated participant presentations and final projects.

Results Over the course of 3 years, 91 trainees (of approximately 1000 trainees each year) from 36 GME programs (of 82 accredited programs) have participated in the program. The number of participants has increased each year, and 22 participants have completed the program overall. Cost for each participant is estimated at $500. Participant projects addressed a variety of education and health care areas, including curriculum development, quality improvement, and national needs assessments. Participants reported that their GME Concentrations experience enhanced their training and fostered career interests.

Conclusions The GME Concentrations program provides a feasible, institutionally based approach for educating trainees in additional interest areas. Institutional resources are leveraged to provide and customize content important to participants' career interests beyond their specialty.

Introduction

Trainees commonly report career interests that transcend their chosen specialty, and smaller or resource-limited programs may be challenged to respond. Several academic medical centers have attempted to address gaps in the graduate medical education (GME) curriculum and individual needs with institution-wide offerings.[1–8] However, many of these include only 1 content area.

Here we describe the development and implementation of an institution-wide program for trainees in response to resident and program preferences. The Duke University Hospital GME Concentrations program has an emphasis on content not traditionally included in GME, with a goal of partnerships to provide interdisciplinary content and mentorship. Institutions may benefit from utilizing the program described here as a model to implement similar offerings.

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Editor's Note: The online version of this article contains the 13-question survey of GME Concentrations program and the 2014 GME Concentrations program final evaluation tool.

Methods

Needs Assessment

A 13-question survey (provided as online supplemental material) was sent electronically to all 93 existing Accreditation Council for Graduate Medical Education (ACGME) accredited and internally sponsored GME program directors querying their program needs, current related initiatives, and suggestions for content and format.

A total of 33 of 93 (35%) program directors completed the survey, with 19 (58%) indicating their departments lacked a program to educate residents in nonclinical interest areas. Respondents noted that an

institution-wide initiative would help fulfill GME requirements and better prepare trainees for what lies ahead. We also asked respondents to volunteer or suggest advisory committee members.

Development

The needs assessment identified 4 areas: (1) Resident-as-Teacher; (2) Patient Safety and Quality Improvement; (3) Law, Ethics, and Health Policy; and (4) Leaders in Medicine. Individuals were recruited from those identified in the needs assessment along with other experts across the institution to participate on concentration-specific advisory committees. Forty individuals, representing 7 clinical departments and a variety of leadership positions, were asked to serve on the 4 advisory committees.

Advisory committee members identified program objectives for each concentration. To address each learning objective, the advisory committees used literature reviews, their content expertise, and the needs assessment data to develop curricula. Committees were encouraged to incorporate a variety of activities to meet different learning styles, and the committees created concentration requirements involving didactics, group activities, practical experiences, readings, and a capstone project (TABLE 1).

Guidelines for program format and rigor were provided by the program manager (M.R.) and first author (A.N.) who have experience in curriculum development and GME.

Common Curriculum

All concentrations have the following common curricular expectations:

Directed Readings: The advisory committees maintain a core list of required readings for each concentration.[9]

Committee Participation: Participants are expected to observe or participate in program, departmental, and institutional committees related to their specific interests.

Individual Project: With mentor guidance, an emphasis on outcomes, and an eye toward publication-worthy scholarship, each trainee is expected to develop a capstone project anticipated to benefit the program or institution. Institutional Review Board approval, data collection, data analysis, and preparation of an abstract or manuscript are expected. In lieu of a project, the Leaders in Medicine participants work through team-based case studies.

What was known and gap

There are few descriptions of programs that address trainee career interests and goals beyond a clinical focus.

What is new

A needs assessment resulted in an institutional program with 4 areas of emphasis to address learner interest and learning needs.

Limitations

Requirements for financial support and resident time commitment reduce feasibility for some institutions or specialties.

Bottom line

The program provides an institutionally based approach for meeting trainees' nonclinical learning interests.

Concentration-Specific Curricula

Each concentration has specific goals, objectives, learning activities, and evaluation methods to meet unique learning needs. Participants upload documentation of completed work into a personal online portfolio for review by advisory committee members. Examples of concentration-specific curricula include the following:

Teaching Triangles (RAT): Modeled after work in the Duke University Graduate School,[10] Resident-as-Teacher (RAT) participants form triads responsible for observing and providing feedback on teaching encounters.

Journal Club (RAT): Each RAT trainee presents once yearly during the quarterly journal club, using a template to organize his or her 20-minute presentation followed by 10 minutes of discussion. Evaluations include peer feedback on teaching skills.

Patient Safety and Quality Improvement Training (PSQI): Participants complete TeamSTEPPS Essentials or Master Trainer courses and the Physician Leadership in Patient Safety and Quality course. Members also participate on the Resident Institutional Patient Safety and Quality Committee.

Health Policy Lecture Series (LEHP): Participants attend the GME Health Policy Lecture Series consisting of ten 1-hour lectures.

Leadership Book Club (LIM): Participants read and analyze books related to leadership skills and effective leadership.

TABLE 1
Concentrations Learning Objectives and Requirements

	Objectives	Requirements
Resident-as-Teacher	▪ Review key elements of adult learning theory ▪ Identify and apply effective teaching skills (bedside, small group, and lecture) ▪ Describe and utilize formative evaluation methods ▪ Comprehend techniques of summative evaluation ▪ Recognize and utilize innovation in teaching and learning (to best meet individual learner needs) ▪ Employ elements of curriculum design to create a didactic session or equivalent ▪ Identify effective educational, administrative, and leadership skills ▪ Contribute to medical education through scholarship	▪ Teaching Triangles ▪ Education-related committee work ▪ Resident-as-Teacher Journal Club ▪ GME Program Review ▪ Medical education readings (4 required) ▪ Final project presented (developed, implemented, and assessed throughout the year with a mentor) ▪ Development and submission of a medical education abstract ▪ Attend a medical education conference (strongly encouraged but not required) ▪ Adult Learning Workshop Series
Law, Ethics, and Health Policy	▪ Interpret laws and legislation, and accreditation that impact health care, teaching institutions, and the role of physicians (eg, HIPAA, Medicare/Medicaid, Joint Commission, North Carolina Medical Board) ▪ Identify and analyze ethical issues faced by health care providers ▪ Understand how physicians can impact related laws/policies ▪ Analyze the intersection of law and medicine on individual and broad levels ▪ Determine personal action plan	▪ Attend the GME Health Policy Lecture Series ▪ Participate in three 90-minute live discussions ▪ Introduction to Health and Law ▪ Anil Potti Case Study ▪ Terri Schiavo Case Study ▪ Attend 6 Hospital Ethics Committee meetings ▪ Related readings (7 required) ▪ Final project presented (developed, implemented, and assessed throughout the year with a mentor) ▪ Attend a health care policy/law/ethics conference (strongly encouraged but not required)
Patient Safety and Quality Improvement	▪ Recognize the role and impact of the health care team on patient safety ▪ Appraise national, health system, and specialty-specific efforts in PS/QI ▪ Compare major PS/QI issues at DUHS, DUH, and the departmental level ▪ Identify opportunities to improve patient safety efforts at a divisional or clinical specialties unit level ▪ Describe how future physician reimbursement may be tied to quality and safety ▪ Analyze strategies to prevent and improve medical errors	▪ Serve on Patient Safety and Quality Council, either as a task force chair or in an active role ▪ Selected modules from the Institute of Healthcare Improvement ▪ TeamSTEPPS Essentials (4-hour course) ▪ TeamSTEPPS Train the Trainer (2 full days) ▪ Physician Leadership in Patient Safety and Quality (1-day) course ▪ Duke Annual Patient Safety Conference ▪ Duke Women's Core Safety meetings ▪ Leader Patient Safety Walkrounds once quarterly ▪ Just Culture for Healthcare Managers ▪ Just Culture: Manager Work Sessions (2-hour) course ▪ Related readings (16 required)
Leaders in Medicine	▪ Describe organizational structure and health care operations ▪ Understand hospital governance through exposure to physician leadership ▪ Analyze current challenges to health care leadership and formulate solutions ▪ Recognize your role as physician leader in situations without a formal title ▪ Appraise your personal leadership style and obtain skills to accommodate ▪ Recognize the importance of ethics in oversight and function ▪ Summarize and utilize effective interpersonal communication skills ▪ Identify your contributions to a health care team	▪ Develop a leadership development plan ▪ Attend "Lunch with Hospital Leaders" sessions ▪ Shadow a senior leader ▪ Attend core management skills lectures ▪ Attend and participate in a leadership book club ▪ Complete MBTI with certified facilitator ▪ Complete and present: o Paul Levy Case Study o Cleveland Clinic Case Study ▪ Related readings (5 required)

Abbreviations: GME, graduate medical education; HIPAA, Health Insurance Portability and Accountability Act; PS/QI, Patient Safety and Quality Improvement; DUHS, Duke University Health System; DUH, Duke University Hospital; MBTI, Myers-Briggs Type Indicator.

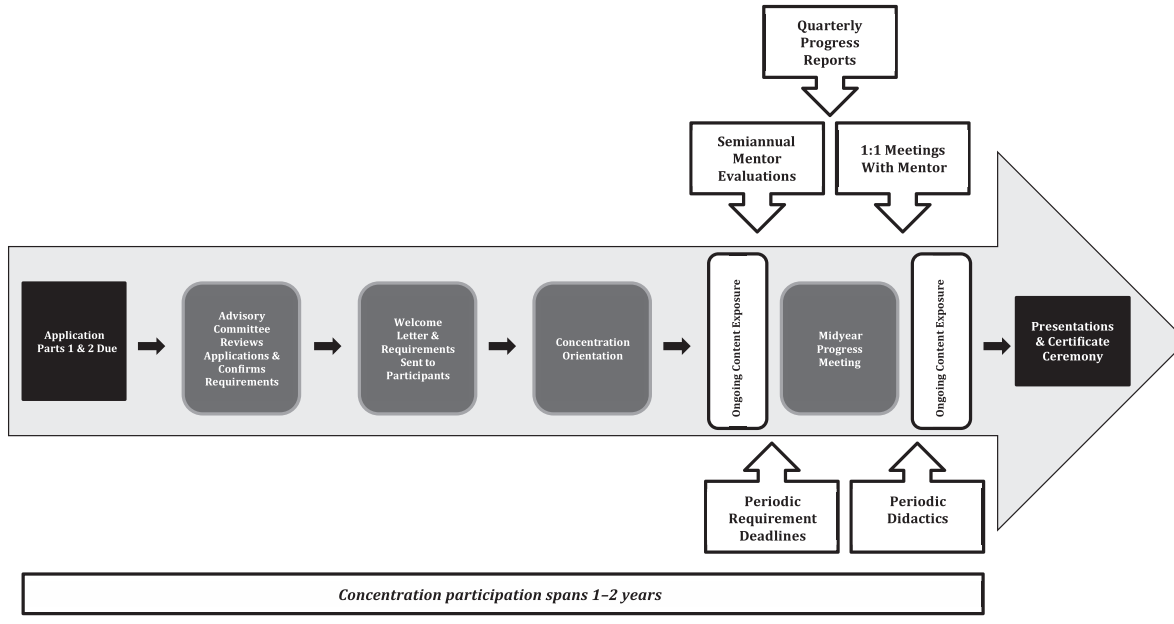

FIGURE
Components and Requirements for Successful Completion of Concentrations Program

Implementation

A 0.25 full-time equivalent project manager, with a bachelor's degree and 5 years of experience in medical education program planning and implementation, facilitates all logistics. This includes, but is not limited to, development of marketing materials, in-person events, evaluation, and a webpage housing curricular components, resources, and an electronic portfolio for each participant. Marketing materials are provided to GME programs to assist with recruitment efforts.

Enrollment

Interested trainees complete an application, which is reviewed by the pertinent advisory committee. As long as the program director supports participation, and applicants have completed all paperwork, they are extended an invitation to participate. The advisory committee also identifies mentors for each participant. In the initial proposal for funding, the investigators estimated 10 participants per concentration area per year for 3 years, with some expected variability.

The design of each program includes a number of components and requirements for successful completion (FIGURE), beginning with an orientation. The program can span 1 to 2 years with periodic deadlines, group meetings, and mentoring. A final session culminating in project presentations and the awarding of Certificates of Completion is held at the end of the academic year.

Evaluation

An evaluation tool (provided as online supplemental material) was developed to gather feedback from participants and attempted to determine success of the program. In addition, there is monitoring of the number of applications, completion rates, faculty participation and time, any costs, and related scholarly productivity. Participants answer 2 open-ended questions regarding expectations for their experience, and the concentration component they believe will (pre) and has (post) been most meaningful. Participants' project presentations are evaluated on clarity, content, and overall presentation skills.

Our study was declared exempt by the Duke Hospital Institutional Review Board.

Analysis

Due to the relatively small number of graduates in each concentration area, we report descriptive statistics, aggregate outcomes, and qualitative findings.

Results

Feasibility

The program is currently funded from a previously described Quasi-Endowment[11] with plans to move to

TABLE 2
Participants by Concentration and Year

	July 2012 Cohort	July 2013 Cohort	July 2014 Cohort	Current Status
Resident-as-Teacher	10 accepted	9 accepted	21 accepted	8 graduated
	3 withdrew	1 withdrew	2 withdrew	26 current
Law, Ethics, and Health Policy	5 accepted	5 accepted	4 accepted	3 graduated
	1 withdrew	1 withdrew		9 current
Patient Safety and Quality Improvement	2 accepted	8 accepted	8 accepted	4 graduated
	1 withdrew	1 withdrew		12 current
Leaders in Medicine	N/A	9 accepted	10 accepted	7 graduated
		1 withdrew	1 withdrew	10 current

Abbreviation: N/A, not applicable.

more permanent funding sources through the institutional hospital budget. Advisory committee members (semiannual 90-minute meetings and periodic e-mail correspondence) and mentors (2 to 4 hours per month with mentee) volunteer their time. Cost per participant is estimated at $500. Funds are allocated to refreshments, general and specific research support, books and other resources for participants, and certificate framing.

To date, all trainees who applied and received program director approval have been accepted into the program. While funding initially supported 10 participants per concentration area per year, we have been able to use existing resources and exercise fiscal responsibility to increase the number of participants. Seventeen trainees began the program in July 2012; 31 in July 2013; and 45 in July 2014 (TABLE 2). Five participants in 2013 and 16 in 2014 successfully completed their requirements and graduated from the program. Graduates reported that participation in the program required a 2- to 6-hour monthly time commitment. Another 29 participants graduated in June 2015 whose survey results and project outcomes are not included in this article.

Effectiveness

Participants' individual projects have included enduring educational initiatives, practice improvement recommendations, and administrative oversight (TABLE 3).

To date, 13 of 16 graduates have completed a pre and post self-assessment and evaluation to gather feedback on opportunities for program enhancement. Prior to participating, individuals predicted that *live sessions* and *personal project* components would be the most meaningful. Postsurvey, most trainees reported that the greatest impact was from *personal projects* and *mentor relationships*. A majority of respondents (71%, 10 of 14) noted the critical importance of the mentor-mentee relationship, and 64% (9 of 14) reported that they built relationships with individuals outside their specialty that enhanced their training and or patient care.

Many respondents (57%, 8 of 14) indicated that they incorporated new skills and knowledge acquired into daily work, and 36% (5 of 14) anticipated encouraging others to pursue knowledge and skills in the concentration area. The program met the expectations of all respondents.

Discussion

The GME Concentrations program experience has been positive. The program provides a unique, collaborative, institutionally based approach to providing 4 critical content areas. It allows participants to learn in multidisciplinary communities and have mentor relationships with content experts from different specialties and health professions. While a small percentage of residents participate overall (given Duke has approximately 1000 trainees), the GME Concentrations program meets the needs of trainees motivated to gain additional skills and knowledge in 1 of these areas.

Specific ACGME requirements, including scholarly activity, can be addressed through work in concentrations such as the ones we developed. Participants' online portfolio can be used as evidence of scholarship. Many individual projects have resulted in national presentations and manuscripts, and individual trainees can build a portfolio and networks tailored to their career goals.

Harnessing interdisciplinary resources and expertise and encouraging collaboration provides efficiencies that individual departments cannot easily offer.

TABLE 3
Graduate Final Projects

Concentration	Final Project
RAT	Developed an online pressure ulcer module with applied learning exercises for internal medicine residents to complete during the geriatrics rotation
	Assessed the degree of confidence of pediatrics residents in managing common pediatric neurology cases
	Developed a resident-led RAT curriculum for obstetrics and gynecology residents
	Utilized virtual reality simulation to assess retention of robotic skills competency in surgery residents
	Developed and implemented an educational intervention aimed to improve knowledge, self-efficacy, and screening behaviors for delirium among ICU nurses
	Implemented an evaluation tool for emergency medicine residents to gain an understanding of clinical reasoning during patient encounters
	Used ACGME milestone format as a template to develop cross-specialty milestones specific to resident teaching performance skills
	Created and disseminated a 40-question online survey to identify the types of technologies integrated into pathology residency programs nationwide
PSQI	Investigated conformance across quality measures for oncology fellows and attending physicians at the Durham VA Medical Center to inform best practices
	Developed and implemented a resiliency training curriculum for obstetrics and gynecology residents and studied it using a validated instrument
	Identified quality improvement practices to result in higher vaccination documentation and implementation in an outpatient clinic
	Created standardized handover processes for postoperative care in the pediatric ICU intended to decrease errors and medication delays
LEHP	Completed a thorough analysis of cost savings in pathology laboratories with the purchase and utilization of specific digital pathology equipment
	Utilized a mixed-methods approach to understand critical concepts and patterns in the use of health care for chronic diseases in the Kilimanjaro Region of Tanzania
	Developed health disparities modules for trainee use focusing on services for non–English-speaking patients

Abbreviations: RAT, Resident-as-Teacher; ICU, intensive care unit; ACGME, Accreditation Council for Graduate Medical Education; PSQI, Patient Safety and Quality Improvement; VA, Veterans Affairs; LEHP, Health Policy Lecture Series.

The institution benefits from participants' projects, some of which have yielded sustainable hospital process changes and enhanced educational programs (eg, a resiliency program, national survey data regarding specialty-specific training needs, new medical student rotations, and education modules). In terms of Kirkpatrick's hierarchy of program evaluation, products of the GME Concentrations program generate changes at the levels of individual behavior and the system.[12]

Participants reported the mentored projects as the most impactful component, with the program creating a system that promotes collaborative efforts among programs much in the same way that faculty academies improve networking and collaboration in academic medical centers.[13] We are hopeful that the program provides an infrastructure for long-term projects with multiple collaborators and sustainable interventions in quality, safety, and medical education research.[14,15] These activities have the potential to impact patient care by improving collaboration among trainees and their mentors.[6,16]

An exciting and unintended consequence of the GME Concentrations program is interdepartmental faculty collaboration, and additional faculty members have asked to join. We are hopeful that relationships will persist and result in interdepartmental efforts beyond the program.

The intervention has some limitations in terms of generalizability. We are fortunate to have strong institutional support through the Innovations Grant process, allowing for statistical support, meals during meetings, relevant books, and small travel grants. Funding may be challenging to sustain in increasingly resource-constrained academic medical centers. As interest grows, we face the possibility of a program that outgrows its resources. We have not at this time capped participation, but would have to consider doing so if interest exceeded funds and available resources such as time and mentors.

An important component of this program is capitalizing on freely available institutional resources, such as TeamSTEPPS and monthly health policy lectures sponsored by the GME office. Partnering with other educators and sharing resources will be important to successfully implementing and sustaining similar programs.

We learned that identifying reasonable criteria and deadlines for participants is critical to the success of individuals and the program as a whole. Initially, participants were allowed to select the length of time (up to 3 years) to complete the requirements, yet we experienced an unexpectedly low graduation rate. This led us to institute more stringent completion criteria with concrete deadlines, which has resulted in improvements in successful completion as illustrated by 29 participants who graduated in June 2015.

Conclusion

The GME Concentrations program leverages institutional resources and faculty, helps trainees identify and deepen areas of nonclinical interest, and results in sustainable projects. Other institutions may be able to replicate our approach to the benefit of institutions, programs, and trainees.

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Alisa Nagler, EdD, JD, is Assistant Professor, Professor of the Practice of Medical Education, Duke University School of Medicine; **Saumil M. Chudgar, MD, MS,** is Assistant Professor, Department of Medicine, Duke University School of Medicine; **Mariah Rudd, BS,** is Project Manager, Graduate Medical Education, Duke University School of Medicine; **Shari A. Whicker, EdD, MEd,** is Assistant Professor, Office of Continuing Professional Development, Virginia Tech Carilion School of Medicine; **Jane P. Gagliardi, MD, MHS,** is Associate Professor, Department of Psychiatry and Medicine, Duke University School of Medicine; **Aditee Narayan, MD, MPH,** is Associate Professor, Department of Pediatrics, Duke University School of Medicine; **Mitchell T. Heflin, MD, MHS,** is Associate Professor, Department of Medicine, Duke University School of Medicine; **David C. Gordon, MD,** is Associate Professor, Department of Surgery,

Duke University School of Medicine; and **Kathryn M. Andolsek, MD, MPH,** is Professor, Department of Community and Family Medicine, Duke University School of Medicine.

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Corresponding author: Alisa Nagler, EdD, JD, Duke University Hospital, Graduate Medical Education, PO Box 3951, Durham, NC 27710, 224.240.3028, nagleralisa@gmail.com

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