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## Abstract

*Background:* The Accreditation Council for Graduate Medical Education (ACGME) common and specialty program requirements stipulate that residents/fellows participate in scholarly activities. The ACGME provides a reporting template tool for scholarly activity to be utilized by all specialties for evaluation annually. In this study, we aimed to: 1) Conduct a content analysis of the specialty scholarly activity requirements for all ACGME-accredited training programs to identify commonalities and variations, and 2) Assess alignment between the specialty scholarly activity requirements and the reporting template tool provided by the ACGME.

*Methods:* The scholarly activity requirements for all ACGME-accredited residency and fellowship specialties in the United States were reviewed. Three authors reviewed these requirements and reached consensus on a codebook. Using a content analytic approach, the requirements were then iteratively coded by two authors and reviewed by a third author until all three reached consensus. Frequency counts were analyzed using descriptive statistics. The verbiage in the requirements was also reviewed for alignment with the ACGME reporting template tool.

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*Conclusion:* The variability in requirements among the programs allows for flexibility; however, some of the stated scholarly activity requirements may not be easily assessed with the current ACGME reporting template tool.

## Keywords

Residency, Fellowship, Scholarly Activity, ACGME

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# A Content Analysis of the Scholarly Activity Requirements in ACGME-Accredited Residency and Fellowship Programs

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## Abstract

**Background:** The Accreditation Council for Graduate Medical Education (ACGME) common and specialty program requirements stipulate that residents/fellows participate in scholarly activities. The ACGME provides a reporting template tool for scholarly activity to be utilized by all specialties for evaluation annually. In this study, we aimed to 1) Conduct a content analysis of the specialty scholarly activity requirements for all ACGME-accredited training programs to identify commonalities and variations, and 2) Assess alignment between the specialty scholarly activity requirements and the reporting template tool provided by the ACGME.

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## Introduction

The Accreditation Council for Graduate Medical Education (ACGME) is a not-for-profit organization that sets standards for

graduate medical education (GME) specialty programs and provides accreditation through voluntary evaluation.<sup>1</sup> Scholarly activity is considered an integral component of GME training. The primary goals of scholarly activity are to foster critical thinking, literature evaluation, knowledge assimilation, and lifelong learning. The ACGME recognizes the diversity of residencies and future physician roles and permits a broad range of scholarly activities, including quality improvement, population health and teaching, and biomedical research, among others.<sup>2</sup> Participation in research during residency/fellowship can be associated with many benefits, not only during the program, but also after graduation and likely for the entirety of the physician's career. For example, designing research studies and protocols can stimulate the development of critical thinking and analytical skills, which enables trainees/physicians to address clinical problems or educational gaps in real-time.<sup>3-6</sup> Previous studies also demonstrate that residents who participated in research had improved satisfaction, improved clinical care, and were more likely to pursue an academic career.<sup>3,7-8</sup> Participating in scholarly activities may also enhance physicians' abilities to interpret the value and merit of published literature and how it might affect their day-to-day practice.

The ACGME provides a means to evaluate each program's accomplishments in this area via a scholarly activity template tool, to be utilized by all GME specialties each academic year during their annual program evaluation. The ACGME has Common Program Requirements (CPR) for all residencies and fellowships. The CPR for residency programs is stated as, "residents must participate in scholarship" while the CPR for fellowship programs is stated as, "Fellow scholarly activity [The Review Committee may further specify]."<sup>2</sup> This permits a broad scope of activity to be defined within each program.

Beyond the CPR, each specialty Residency Review Committee (RRC) can further detail the scholarly activity requirements pertaining to their specialty. These requirements extend across the spectrum, including categories related to publications, presentations, and research.<sup>9</sup> The 29 RRCs of the ACGME provide scaffoldings of scholarly activity

requirements, which can be highly variable depending upon the specialty. This is beneficial because the specialties themselves can be highly variable. Designated Institutional Officials (DIOs), program directors (PDs), and other GME personnel proactively monitor these varying lists of scholarly activity requirements to ensure compliance and thereby avoid citations.

The aim of our study was two-fold: (1) to complete a content analysis of the specialty scholarly activity requirements for all the ACGME-accredited training programs to identify commonalities and variations in requirements. We anticipate this document could be a valuable one-stop resource for viewing and comparing the scholarly activity requirements across all ACGME training programs, which could be valuable for RRCs, DIOs, PDs, assistant program directors (APDs), program coordinators (PCs), and other GME support staff; (2) to examine how the stated requirements by specialty align with the scholarly activity template tool provided by the ACGME for annual reporting.<sup>10</sup> Specifically, we were interested in comparing the verbiage utilized in the specialty program requirements to determine if it aligns with the verbiage included in the scholarly activity reporting template tool to determine functionality of the tool and any potential areas for improvement.

## Methods

### *Assessing Requirements and Categorizing Training Programs*

To conduct a content analysis of the scholarly activity requirements for all ACGME-accredited residency and fellowship specialties, we accessed the specialty-specific program requirements via the ACGME website during the year 2020.<sup>9</sup> The ACGME scholarly activity requirements are publicly available and are not human subjects research; therefore, we did not seek Institutional Review Board approval. We obtained data about the scholarly activity requirements as specified in the Educational Program, Scholarship section for each specialty program and placed it into two separate categories, residencies and fellowships, for comparison within and between each category.<sup>9</sup> Any

training that required prior, multi-year GME training (other than a transitional year), was classified as a fellowship. For example, Allergy and Immunology, Colorectal Surgery, Thoracic Surgery (independent) and Plastic Surgery (independent) were categorized under fellowship specialties because these programs can only be entered by completing a prior, multi-year residency program. Any specialties classified as “integrated” were categorized with the residencies because they may be entered directly after completion of medical school. Additionally, specialties that included a single transitional year were also classified as residencies. Therefore, a total of 29 specialties were classified as residencies (Table 1). Of these 29 residency specialties, we classified 21 as core residencies because they provide a pathway to fellowship programs (Supplemental Table 1).

### Content Analysis

Starting with the residency specialties, we performed a conceptual content analysis on all items related to “scholarship,” “scholarly activity,” and “research” within each set of ACGME program requirements.<sup>11</sup> We did not include the CPRs for scholarly activity in this evaluation, since CPRs are consistent across all specialties; rather, we focused on the specialty program scholarly activity requirements. Three authors reviewed the requirements multiple times to arrive at an initial consensus on a codebook to tabulate these requirements for all residency specialties. Using an inductive content analytic approach, the scholarly activity requirements were then iteratively coded by two authors and subsequently reviewed by a third author until all three authors reached final consensus.<sup>11</sup> This process was inductive because the authors developed codes based on the data itself rather than starting with fixed codes. Frequency counts were analyzed using descriptive statistics. Two senior authors utilized the codes to design the tables for reporting the results.

The 112 fellowship specialties were analyzed using a similar inductive content analytic method. The fellowships were more complex to evaluate because, after completion of a core residency program, graduates become eligible to enter several related fellowships. Similarly, several fellowships can be entered via multiple training pathways. For example, after completion of an Anesthesiology residency program, a physician can enter nine different ACGME-accredited fellowship specialties. Some of these nine fellowship specialties can be matriculated into after graduating from core residency specialties other than Anesthesiology. To ensure accuracy and avoid

redundancy, each fellowship was counted only once for analysis. A list of all fellowships and their core residency specialties can be found in Supplemental Table 1.

### Alignment to ACGME Scholarly Activity Template

We then compared the requirements in each specialty to those on the ACGME scholarly activity template tool, which includes the following categories: “PubMed ID (PMID), Other Publications (not recognized by National Library of Medicine (NLM)), Conference Presentations, Chapters/Textbooks, Participate in Research, and Teaching/Presentations” (Supplemental Table 2).<sup>10</sup> Only scholarly activity requirements that were *explicitly stated* in the specialty requirements were captured in our evaluation, wording was taken verbatim. The use of “OR” and “SHOULD” statements were commonly encountered in our evaluation, as these statements provide versatility and flexibility for trainees when completing scholarly activities. We were aware of these statements; however, coding to include all nuances such as these would have made our results even more complicated and tables lengthier. Simply put, our coding technique recorded the specific verbiage utilized in the specialty scholarly activity requirements.

## Results

### Residency Specialty Scholarly Activity Requirements

A total of 29 specialties were classified as residencies. We noted that there were several commonalities within the scholarly activity requirements, but at the same time there were many variations in the details of those requirements depending upon the specialty. Table 1 outlines the scholarly activity requirements for the residency training programs as they relate to the ACGME scholarly activity template tool. If we consider PMID and Other Publications, (which do not have a PMID), as mutually exclusive categories (must publish in one form or the other), only five specialties (Anesthesiology, Emergency Medicine, Internal Medicine, Plastic Surgery (integrated) and Thoracic Surgery (integrated)) utilize verbiage that aligns with all the ACGME-specified categories of scholarly activity included in the template tool.

The most common ACGME-specified category used by the specialties was “participate in research” (n=21; 72%). These specialties used a variety of language, ranging from a few sentences to a very detailed, descriptive paragraph. The least common

ACGME category articulated by specialties was the requirement of a publication with a PubMed ID (7%). Specifically, Plastic Surgery (integrated) and Thoracic Surgery (integrated) require residents to demonstrate publication with a PMID, whereas 48% of specialties require other publications (not recognized by the NLM). Eight specialties, (28%) did not include verbiage that directly matched the wording in the ACGME scholarly activity template tool and therefore have no categories selected in Table 1 nor Figure 1. The majority of these eight programs simply used the indistinct phrase, “residents must participate in scholarship,” which is also the verbiage in the CPRs.

We further delineated the reporting requirements for residencies (Table 2) by breaking them down into written reporting (manuscripts, chapters, etc.) or oral reporting (presentations at meetings) when these details were available. Approximately 55% of the specialties required some form of written scholarly activity. Furthermore, 10 specialties (34%) specified the need for a peer-reviewed publication, whereas six specialties (21%) supported publication of chapters. Eleven specialties (38%) specified the forum for oral presentations, ranging from journal club to state, regional, national, and international scientific meetings. Most specialties that have written or oral reporting requirements (out of 29 specialties, 16 provide details related to reporting of scholarly activity) also state that publications or presentations will meet this requirement (93% or 15/16).

Additional information regarding residency requirements for scholarly activity can be seen in Supplemental Table 3. Beyond the broad, general requirements, several specialties outlined additional details pertaining to the amount of time to be allotted for scholarly activity and/or specifics regarding what the scholarly activity should constitute. Twelve specialties (41%) had some description of the length of time during residency that may be allotted for participation in scholarly activity. This varied from a range of 8 weeks to a maximum of 16 months with 3 to 6 months being the most specified timeframe. Nineteen specialties (66%) outlined specific conditions of scholarly activity. The most common statement was residents “will participate in at least one project under the supervision of faculty.” A minority of specialties (up to 10%) also specified that residents should be involved in study design/proposal development, data collection/methodology, data analysis, and securing funding/grant involvement (Emergency Medicine, Internal Medicine and Pathology Anatomic and

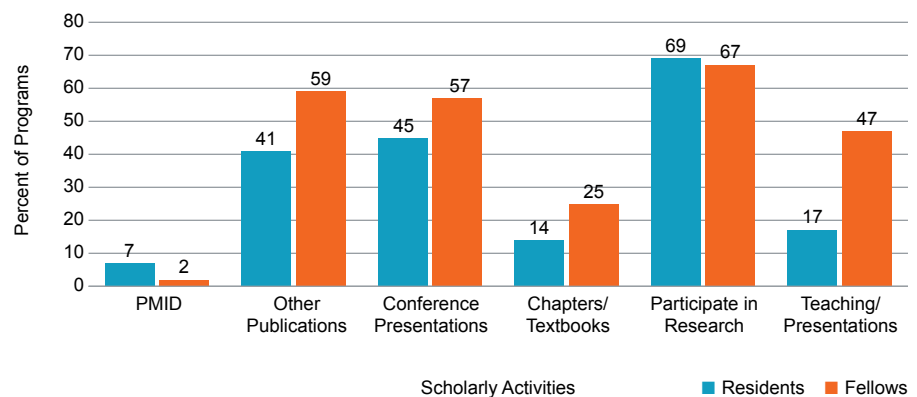
**Table 1.**

The six ACGME-specified categories of scholarly activity required of residency programs, as detailed in the scholarly activity template tool. Tick marks were only included when the program explicitly stated the requirement in the specialty program requirements. All program requirements are for the year 2020.

Program Name	PMID	Other Publications (not recognized by NLM)	Conference Presentations	Chapters/ Textbooks	Participate in Research	Teaching/ Presentations
Anesthesiology		X	X	X	X	X
Dermatology		X	X		X	
Emergency Medicine		X	X	X	X	X
Family Medicine					X	
Internal Medicine		X	X	X	X	X
Internal Medicine-Pediatrics						
Medical Genetics & Genomics		X	X		X	
Neurological Surgery		X		X	X	X
Neurology						
Child Neurology						
Nuclear Medicine		X	X		X	
Obstetrics & Gynecology						
Ophthalmology						
Orthopedic Surgery		X	X		X	
Osteopathic Neuromusculo-skeletal Medicine		X	X		X	
Otolaryngology		X			X	
Pathology - Anatomic & Clinical		X	X		X	X
Pediatrics						
Physical Medicine & Rehabilitation						
Plastic Surgery (integrated)	X		X	X	X	X
Preventative Medicine						
Psychiatry					X	
Radiation Oncology		X	X		X	
Diagnostic Radiology		X	X		X	
Interventional Radiology		X	X		X	
General Surgery					X	
Vascular Surgery (Integrated)					X	
Thoracic Surgery (Integrated)	X		X	X	X	X
Urology					X	
<b>Total N (% of programs)</b>	<b>2 (7%)</b>	<b>14 (48%)</b>	<b>14 (48%)</b>	<b>6 (21%)</b>	<b>21 (72%)</b>	<b>7 (24%)</b>

Clinical). Some specialties (7/29; 24%) did not provide any additional details related to time or conditions of the scholarly activity in their written requirements (Supplemental Table 3).

Teaching/Presentations is one of the six ACGME-specified defined categories of scholarly activity. Six specialties (21%) specified that residents should participate in teaching (didactics, etc.) or presentations (grand rounds, etc.). A minority of specialties had further requirements such as leadership roles (2/29; 7%, Emergency Medicine and Internal Medicine), participating in professional committees (3/29; 10%, Emergency Medicine, Internal Medicine and Osteopathic Neuromusculoskeletal Medicine),



**Figure 1.** Scholarly activity requirements for residents and fellows as they correspond to the ACGME scholarly activity template.

**Table 2.**

Detailed description of reporting requirements for residencies divided into two categories: Written reporting and Oral reporting if provided within the ACGME specialty program requirements.

Program Name	WRITTEN REPORTING				ORAL REPORTING		Details
	Peer-reviewed	Non peer-reviewed	Required but not specified	Book chapter	Type of meeting	Required but not specified	
Anesthesiology	X			X	Local, regional, or national		Publication and/or presentation
Dermatology	X				National (*only attendance required)		Oral or poster presentation or publication
Emergency Medicine	X	X		X		X	QI, presentations, posters, workshops, podium presentations,
Family Medicine							
Internal Medicine		X		X			Posters, workshops, QI, or podium presentations
Internal Medicine-Pediatrics							
Medical Genetics & Genomics			X			X	Presentation or publication
Neurological Surgery	X	X		X		X	Presentation or publication
Neurology							
Child Neurology							
Nuclear Medicine			X		Institutional, local, regional, or national		Published or presented
Obstetrics & Gynecology							
Ophthalmology							
Orthopedic Surgery	X				Regional or national		Article, presentation, or participation in lit review
Osteopathic Neuromusculoskeletal Medicine			X		State, regional, or national		Original paper or presentation
Otolaryngology	X						Publication
Pathology - Anatomic & Clinical	X				Journal club, local, regional, or national		Presentation or publication
Pediatrics							
Physical Medicine & Rehabilitation							
Plastic Surgery (integrated)	X			X	Regional, national, or international		Publications or presentations
Preventative Medicine							
Psychiatry							
Radiation Oncology	X				Scientific		Publication or presentation
Diagnostic Radiology			X		Institutional, local, regional, national, or international		Published or presentation
Interventional Radiology			X		Institutional, local, regional, national, or international		Published or presentation
General Surgery							
Vascular Surgery (Integrated)							
Thoracic Surgery (Integrated)	X			X	Regional, national, or international		Publications or presentations
Urology							
<b>Total N(% of Programs)</b>	<b>10 (34%)</b>	<b>3 (10%)</b>	<b>5 (17%)</b>	<b>6 (21%)</b>	<b>11 (38%)</b>	<b>3 (10%)</b>	

**Table 3.**

The six ACGME-specified categories of scholarly activity for fellowship programs as detailed in the scholarly activity template tool. Numbers expressed in ( ) in the first column indicate the number of fellowships that may be entered under that program. Numbers in columns 2-6 indicate % of fellowships that mention the requirement within the specific program.

Name of Program Preceding Fellowship (# of fellowships under program)	PMID	Other Publication (not recognized by NLM)	Conference Presentations	Chapter/ Textbooks	Participated in Research	Teaching/ Presentations
Anesthesiology (9)	0	78	78	0	67	22
Dermatology (2)	0	100	100	0	0	0
Emergency Medicine (7)	0	71	71	0	100	29
Family Medicine (5)	0	40	40	0	80	20
Internal Medicine (22)	0	82	82	73	36	68
Medical Genetics & Genomics (5)	0	80	80	0	40	20
Neurological Surg (2)	50	0	50	50	100	50
Neurology (9)	0	22	22	0	33	0
Ob & Gynecology (5)	0	0	0	0	100	100
Ophthalmology (1)	0	100	0	0	100	100
Orthopaedic Surg (9)	11	89	100	100	89	100
Otolaryngology (3)	33	67	33	67	33	100
Pathology- Anat & Clinical (12)	0	100	100	0	92	83
Pediatrics (22)	0	14	14	0	91	14
Physical Medicine & Rehabilitation (6)	0	83	83	0	67	33
Plastic Surgery (2)	0	50	50	50	0	100
Psychiatry (9)	0	11	22	0	89	33
Radiology (8)	0	100	100	0	88	0
Surgery (8)	25	25	50	50	63	50
Thoracic Surgery (3)	67	0	67	67	67	67
Urology (3)	33	0	33	33	100	3
<b>All fellowships (112)</b>	<b>2</b>	<b>59</b>	<b>57</b>	<b>25</b>	<b>67</b>	<b>47</b>

and serving as a reviewer or on an editorial board (2/29; 7%, Emergency Medicine and Internal Medicine).

### ***Fellowship Specialty Scholarly Activity Requirements***

Table 3 and Figure 1 outline the scholarly activity requirements for the 112 fellowship training specialties as they align with the ACGME scholarly activity template tool. The most common ACGME-specified category proposed by the fellowship specialties is to “Participate in research” (67%). This is very similar to the percentage of residency specialties with this requirement (72%). The least common ACGME-specified category for fellowships is to have a “PMID” (2%), which was also the least common requirement for residency specialties.

We further evaluated the details of the written requirements (type of publication, peer

review, etc.) for the fellowship specialties (Figure 2a and Supplemental Table 4). The most common requirement (61%) is that fellows must generate a publication of some form during their training. This is much higher than the requirement for the residency specialties (up to 34%). The least common specifications for fellows in terms of written requirements were case reports (2%) and original research or review articles (5%). The oral reporting requirements for fellowships are further detailed in Figure 2b and Supplemental Table 4. Nearly 77% of fellowship specialties expect the fellows to participate in presentation of the scholarly material, which again is notably higher than for the residency specialties (38%).

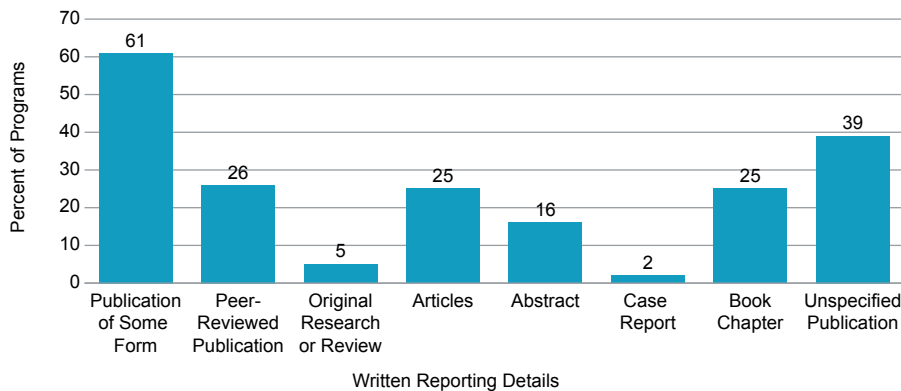
Teaching is a valuable part of fellowship training, and it is generally expected that fellows serve a major role in teaching residents, medical students, and other learners.

Nearly 47% of specialties propose teaching requirements ranging from delivering grand rounds, engaging in teaching, or participating in formal presentations and workshops.

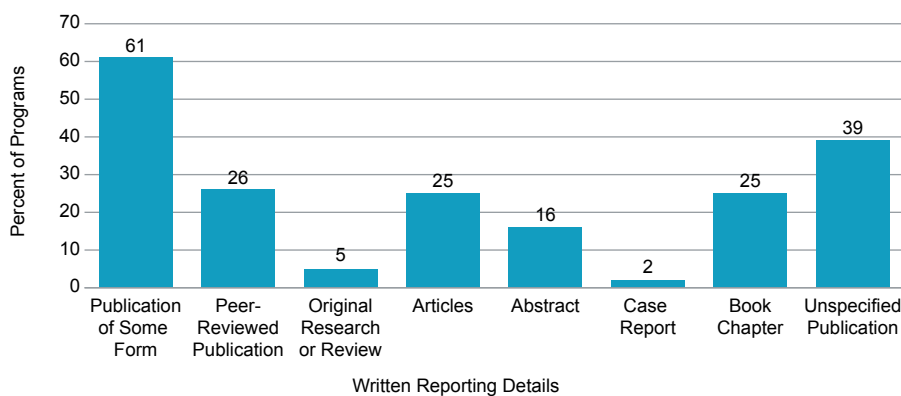
A smaller fraction of fellowship specialties (up to 32%) had further specific requirements that included, participation in quality improvement projects, scholarly activity related to specialty or development of scientific methods, thesis generation, securing funding and serving as a reviewer or editorial board member.

### **Discussion**

The results of our study demonstrate the value the ACGME places on incorporation of scholarly activity into graduate medical education training. We noted that there were many similarities in these scholarly activity requirements across all the residencies



**Figure 2A.** Written reporting requirements for fellowship programs as provided on the ACGME site.



**Figure 2B.** Oral reporting requirements for fellowship programs as provided on the ACGME site.

and fellowships. At the same time, we also found multiple variations in the depth and breadth of these requirements such as those noted between residencies and fellowships. In addition, we noted some areas of incongruence in the verbiage between the specialty program scholarly activity requirements and the reporting template tool provided by the ACGME for annual reporting of scholarly activity. As stated, eight specialties (28%) use the phrase “Residents must participate in scholarship” as the only elucidatory language to describe the required scholarly activities. This broad statement is beneficial for promoting flexibility; however, it could be difficult to categorize within the reporting template tool, as the word, “scholarship” can have many interpretations.

Variations were noted in all six ACGME-defined categories of scholarly activity. For example, some specialties focused on conference presentations whereas a few laid emphases on PMID publications. Another variation was the level of detail outlined in these categories. For some, we noted very

specific requirements such as the clearly documented “amount of time” that should be allocated for research. Whereas for others, the requirements were less detailed such as noting that “residents should participate in research.” While the lack of detail in some categories may lend to confusion, it can also be viewed as the beneficial latitude of freedom afforded by the ACGME and the RRCs to the specialties to determine the best approach for stimulating research in their trainees. Many residency and fellowship specialties differ considerably in terms of clinical demands and length of program, so it is not surprising that there are variable requirements for scholarly activity as well. Because the ACGME has afforded each RRC flexibility to construct requirements appropriate for their specialty, successful participation by the resident/fellow is more likely than it would be with uniform requirements across all specialties. Whereas for others, the requirements were less detailed such as noting that, “residents should participate in research,” which could make it difficult for a program to ensure that they are in compliance with the requirements.

We also noted some variation in the requirements and levels of emphasis between residency and fellowship specialties for some of the six ACGME-defined categories of scholarly activity. In general, we noted that number of requirements and level of emphasis was greater for fellowships when compared to residency specialties. For example, nearly 61% of fellowship specialties stipulated a publication requirement of some form when compared to 55% for residency specialties. Not surprisingly, a much higher number of fellowships (47%) required fellows to participate in teaching/presentations when compared to 24% for residency specialties. This differential emphasis in teaching responsibility for fellows would support the natural progression to their next stage of independent practice and assumption of greater teaching responsibilities. A variation that does not appear to be considered, however, is the duration of the program. A one-year fellowship of specialty training is a relatively short amount of time for trainees to gain the necessary educational training in addition to completing some of the more rigorous scholarly activity requirements.

There are many compelling reasons for promoting residents’ and fellows’ participation in scholarly activity.<sup>12</sup> Most notably, there are a multitude of benefits derived from research-oriented intellectual curiosity, which range from enhancing analytical skills, improving patient care, furthering educational innovation, and fostering a well-balanced path to career growth and satisfaction, among others. Many residency training programs have incorporated mandatory research education or research rotations, which have been shown to cultivate research skills and inquiry.<sup>3-4,7-8,13-14</sup> The ACGME scholarly activity requirements add another highly valuable educational dimension to graduate medical education that will result in producing well-rounded physicians suitable for practice. It is hopeful that over time, these ACGME requirements will not only enhance the career prospects of residents/fellows but also benefit the profession by preparing physicians who are adept at critically evaluating scholarly works, which leads to evidence-based medical care.

An additional area for consideration, however, relates to how specialties are evaluated for successful participation in scholarly activities. Although there is some variability in the scholarly activity requirements between specialties, the ACGME template tool for reporting scholarly activity is constant across all specialties. Many of the scholarly activity requirements can easily be matched into one



or more categories in the ACGME reporting template tool. On the other hand, for some of the scholarly activity requirements, they may require some deliberation to determine the best fit into one or more of the domains in the ACGME template tool for reporting. As RRCs continue to edit and refine the requirements for their specialties, it may be appropriate to continue to refine the scholarly activity template tool to ensure that the stated scholarly activity requirements and the evaluation tools are as closely aligned as possible. Just as educational curriculum and objectives should align with evaluations, we suggest so too should the requirements of programs and the evaluation tool (e.g., the scholarly activity template tool). If these do not align, it could lead to confusion regarding what the program should require of the residents, issues during the annual reporting of activities that have been completed, or even erroneous citations.

There are some limitations in our study. The results of the study are a snapshot of the requirements in effect at this time and may not be applicable in the future if they are modified by the ACGME or the individual RRCs. The variations in the depth of detail of requirements between the individual RRCs sometimes made it difficult to comprehensively summarize or characterize the data.

## Conclusions

The ACGME-defined research requirements are highly valuable and aim to promote scholarly activities for residents/fellows during their training. It is envisaged that satisfying these ACGME-defined research requirements will help to train well rounded physicians. Because the requirements vary for many specialties, having an evaluation tool that aligns with the requirements of each specialty may promote ease and accuracy of reporting scholarly activity. We hope this document will serve as a reference guide to the DIOs, PDs, and other GME staff in their attempts to ensure that all their trainees satisfy the ACGME-defined research requirements. An investigation of faculty scholarly activity requirements would be a natural follow-up to this current work. ■

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