IMPROVEMENT OF RESIDENT SCHOLARSHIP IN AN INTERNAL MEDICINE TRAINING PROGRAM

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INTRODUCTION

The Accreditation Council for Graduate Medical Education (ACGME) stipulates that residents must participate in scholarship, and programs must provide curricula to accomplish this. Residents understand that they should participate in scholarly activity, but are often dissatisfied with their program’s approach.1 Evidence of effective interventions that lead to tangible scholarship in 3-year residencies is inconsistent. Recent systematic reviews have described initiatives utilized by ACGME programs to increase scholarship.2,3 Tripler Army Medical Center (TAMC) Internal Medicine (IM) residency program educates a diverse group of civilian and active duty military residents. We initiated simple, reproducible interventions to improve resident participation in and understanding of the medical research process, based on previously published methods.2–6

METHODS

As a process improvement study, a structural framework was developed for scholarly activity within the TAMC IM residency program. A total of 32–39 IM residents per year participated. The interventions took place at the start of the 2016–2017 academic year. Metrics were collected from July 2016 to June 2019. Metrics from July 2015 to June 2016, before interventions occurred, served as the control. No additional monetary funding was provided.

A Scholarly Activity Council (SAC) was assembled, with a volunteer faculty member serving as Chair (CSAC). The council contained representatives from each IM subspecialty, to act as human resources for projects in their area of expertise. All SAC members were volunteers. The CSAC created a shared access database, including a bulletin of projects needing assistance, deadlines, and a list of project statuses and pending tasks. It was reviewed and updated monthly at a dedicated research conference on the academic schedule, where residents also practiced presentations and discussed projects. Faculty members in attendance at the meeting could give feedback and advice for these presentations or projects. A research curriculum was designed, including monthly lectures on statistical analysis, critical literature appraisal, and guides for manuscript writing. Protected longitudinal research time was added to resident schedules, with 4 weeks of dedicated time per academic year. This time replaced one elective rotation block.

From July 2016 to June 2019, residents were requested to report any new scholarly activity to the Chief of Medical Residents. Metrics collected to evaluate participation included quantity and type of manuscripts published, presentations at local/regional/national conferences, and ongoing or new Institutional Review Board (IRB)-reviewed studies. Abstracts’ or manuscripts’ pending acceptance and in-house scholarship, such as morning report or grand rounds, were excluded.

RESULTS

From July 2015 to June 2016, 4 manuscripts and 2 book chapters were published, and 22 presentations were given. This represented the program’s baseline scholarly activity. During the 2016–2017 academic year, presentations increased to 45 (Table 1). This increase remained stable, with overall 186% growth over 3 years. Accepted peer-reviewed manuscripts surged to 8, and then 14. This represents a 350% growth from the initiation of interventions. In June 2016, an
additional 8 manuscripts were pending acceptance. No active IRB research protocols existed in 2015, but rose to 4 by 2019.

**DISCUSSION**

Scholarship increased within the TAMC IM residency program after instituting reproducible, evidenced-based interventions requiring minimal resources. Overall, the interventions described established a collaborative environment between faculty and residents (Table 2).

Other programs have utilized similar interventions to improve scholarly activity. Among primary care specialties, lack of mentorship and protected time to complete scholarship impacts their ability to fulfill the requirement. Other factors, e.g., prior research experience and desire for fellowship training, may also affect scholarship. Our project presents a standardized, literature-derived approach that is transferable across ACGME programs.

Limitations include a small sample size and limited pre-intervention data. It is difficult to quantify which aspects of the multi-pronged interventions were most successful, and to what degree the culture change, signaled by an overt focus on scholarship, augmented the individual interventions. We posit that the cumulative effect of the interventions outweighed the sum of their parts.

By developing a stable research environment with designated mentors, we increased our production of peer-reviewed publications. Key to the success of the program was the designation of the CSAC, who was empowered to make substantial, meaningful changes. Further work is needed to evaluate how other specialties may benefit from similar interventions, and to refine further the approach to scholarship across ACGME programs.

| Interventions                                      | Purpose                                                                 | Outcome                                                                 |
|----------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------|
| Scholarly Activity Council (SAC)                   | Assemble faculty to act as mentors                                      | Encouraged faculty and resident cooperation and idea sharing           |
|                                                    | Able to assist with scholarship in their subspecialties                 | Facilitated scholarship dedication and completion                      |
|                                                    | Create a standardized review process for manuscript submissions         | Abstract/manuscript submissions were reviewed by multiple faculty members |
| Chair of Scholarly Activity (CSAC)                 | Coordinate assembly of the SAC                                           | Changed the culture of the training program                            |
|                                                    | Lead monthly research meeting                                           | Held individuals accountable                                          |
|                                                    | Rotation director for research block                                    | Fostered professional relationships and promoted academic growth       |
|                                                    | Write and institute research curriculum                                  |                                                                        |
| Comprehensive shared scholarship database          | Track new/ongoing projects and pending tasks                            | Changed the culture of the training program                            |
|                                                    | Introduce residents without experience to process of scholarly activity  | Made scholarship more tangible and accessible for trainees             |
|                                                    | in low-risk, public forum                                               | Encouraged mutual accountability for project tasks                     |
|                                                    | Give residents opportunities to join projects                           |                                                                        |
| Monthly research meeting                           | Remind participants of deadlines for projects                            | Changed the culture of the training program                            |
|                                                    | Discuss and address barriers to project progression                    | Encouraged mutual accountability                                       |
|                                                    | Allow residents to practice presentations                               |                                                                        |
| Scholarship curriculum                             | Educate residents in scholarship, including statistical analysis        | Improved scholarship quality and quantity                              |
|                                                    | critical literature appraisal                                           |                                                                        |
|                                                    | Instruct residents in effective manuscript writing by using multiple    | Improved resident understanding of commonly used statistical methods   |
|                                                    | staff with publication experience, specific journals’ author instructions, standardized templates (i.e., cover letters, quality improvement fishbone designs, etc.) | (correlation, comparison of means, and regression), study design, study population and size, bias, applicability to clinical practice, and clarity of original data presentation |
| Protected research time                            | Grant residents 4 weeks per academic year dedicated to scholarship      | Increased productivity                                                |
|                                                    |                                                                        | Allowed residents to focus on scholarship efforts                      |
|                                                    |                                                                        | Enabled residents to maintain purpose and direction in long-term projects |

Table 1: Scholarly Activities by Type, July 2015 to June 2019. Quantities of Posters, Presentations, Book Chapters, Manuscripts Accepted for Publication, and Active IRB Protocols, in Chronological Order. 2015–2016 Refers to the Pre-intervention Academic Year, with the Three Subsequent Columns Representing Academic Years During which Interventions Were Active

| Academic year | 2015–2016 | 2016–2017 | 2017–2018 | 2018–2019 |
|---------------|-----------|-----------|-----------|-----------|
| Posters/presentations | 22        | 45        | 39        | 41        |
| Book chapters | 2         | 0         | 1         | 2         |
| Accepted manuscripts | 4        | 3         | 8         | 14        |
| Active IRB protocols | 0        | 3         | 3         | 4         |
| Number residents as first author | 4        | 3         | 8         | 14        |
| Number of residents per year | 32        | 34        | 39        | 39        |
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Declarations:

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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