Resident Assembly Advisory Opinion #3

State Main Purpose/Title	Development of a Formal "Residents as Educators" Curriculum

Resident's Name(s)	Daniel London, MD, MS [1] Katherine Mallet, MD [2] Austin Beason, MD [3]	Residency Program	1. University of Cincinnati 2. Mayo Clinic 3. Southern Illinois University

Are you a Resident Delegate?	Yes	Classification of Proposed AO (To the AAOS, to the RA or Other)	AAOS

WHEREAS: The AAOS and AAOS Resident Assembly consistently strive to be leaders in musculoskeletal and surgical education. As residents advance through their training, there is limited time for exploration of teaching methodology while also refining surgical and clinical skills. Despite this, residents are by definition both trainees and educators, as senior residents are required to coach and mentor junior residents and medical students in Orthopaedic Surgery programs across the country. A majority of residents' training as educators is learned on-the-job and by modeling teaching methods used by mentors and faculty.

WHEREAS: The Accreditation Council for Graduate Medical Education (ACGME) expects residents to participate in the education of students, peer residents, and other health care professionals[1]; however, few resources exist for developing the skills needed to do this effectively in Orthopaedic Surgery residency.[1]

WHEREAS: A Governance Principle of the AAOS states, "The Academy represents and supports its members, all orthopaedic surgeons, and the orthopaedic care team through education, advocacy, membership, communication and quality resources and tools." While the priority for education is evident, few tools and limited opportunities for participation in a formal curriculum exist to support resident members in becoming better educators.

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WHEREAS: The AAOS Resident Assembly believes it is essential to provide current residents with evidence-based education on how to teach in the operating room, clinic, and emergency room. Now, therefore, be it resolved:

RESOLVED A: That the AAOS consider providing the AAOS Resident Assembly with resources to develop a "Residents as Educators" virtual curriculum based on core learning principles taught during the AAOS Course for Orthopaedic Educators. Such a curriculum could be created in coordination with AAOS Education Staff and the Education Council or Education Course Committees. This could include a series of quarterly webinars and role-played examples, moderated by AAOS faculty and Resident Assembly Education Committee members, to provide residents with concrete educational tools and skills to effectively teach and lead in the clinical setting. And be it further,

RESOLVED B: That the AAOS consider providing a forum for discussions on the role of the resident as an educator and leader, and sharing methods for teaching, providing feedback, and leading a team in residency and beyond.

[1] McKeon BA, Ricciotti HA, Sandora TJ, et al. A Consensus Guideline to Support Resident-as-Teacher Programs and Enhance the Culture of Teaching and Learning. *J Grad Med Educ*. 2019;11(3):313-318. doi:10.4300/JGME-D-18-00612.1

A Consensus Guideline to Support Resident-as-Teacher Programs and Enhance the Culture of Teaching and Learning

Bri Anne McKeon, MD*
Hope A. Ricciotti, MD*
Thomas J. Sandora, MD, MPH
Subha Ramani, MBBS, PhD, MPH

Richard Pels, MD
Eli M. Miloslavsky, MD
Miriam J. Haviland, MSPH
Tracey A. Cho, MD

ABSTRACT

Background Methods for assessing residents as teachers are limited, and it can be difficult to discern optimal curricula for training residents as educators. A guideline may be a tool to assess resident-as-teacher programs and to help enhance a culture of teaching and learning.

Objective We developed a consensus guideline to assess academic medical centers' resident-as-teacher programs and teaching environments.

Methods Faculty representing 8 specialties from 5 teaching hospitals created a guideline for resident-as-teacher programs through an iterative expert consensus development process. To assess local resident-as-teacher practices, the guideline was administered as an online survey to program directors from 47 residency programs at 5 hospitals. The survey included 26 items addressing curricula, educational climate, financial support, assessment, professional development, and promotion.

Results Forty-nine percent of residency programs surveyed completed the questionnaire, representing 65% of specialties (17 of 26). Respondents reported that residents were required to participate in a teaching orientation in 78% of programs (18 of 23) and were evaluated on teaching in 91% (21 of 23). There were special educational programs and teaching awards in 91% of programs (21 of 23), respectively. All programs included evaluations of faculty teaching, which were linked to faculty annual reviews in 52% of programs (12 of 23), but to faculty promotion or salary in only 22% of programs (5 of 23).

Conclusions We developed a resident-as-teacher consensus guideline that could provide a road map for program directors and institutions to think broadly about how they educate residents and fellows as teachers.

Introduction

The Accreditation Council for Graduate Medical Education (ACGME) expects residents to participate in the education of students, peer residents, and other health care professionals.[1] The Liaison Committee on Medical Education requires residents to demonstrate familiarity with clerkship educational objectives and be prepared for their roles in teaching and assessment.[2] In response to these expectations and requirements, and to enhance residents' teaching skills, many residency programs have implemented dedicated resident-as-teacher programs.[3] Curricular components for such training vary across departments, specialties, and institutions. Some programs have achieved excellence in training residents as educators extending well beyond the minimal ACGME requirements.[4,5] Lectures, seminars, workshops, objective structured teaching exercises, dedicated teaching rotations, and clinician-educator tracks have been described in the literature as programs to improve resident teaching skills.[3–10] Multiple specialties have also incorporated clinical skills teaching in the ACGME Milestones, emphasizing the importance of teaching skills in resident assessment.

To our knowledge, resident-as-teacher assessment methods and optimal curricular elements for training residents as educators are limited.[11] The objective of this study was to develop a consensus guideline to serve as a road map in designing and evaluating resident-as-teacher programs and curricula, which can help enhance the culture of teaching and learning for trainees and faculty.

Methods

This study was conducted at Harvard Medical School in Boston, Massachusetts. Through a resident-as-teacher interest group, we convened a multispecialty study group representing 8 clinical specialties (anesthesiology, emergency medicine, medicine, neurology, obstetrics and gynecology, pediatrics, radiology, and surgery) from 5 major teaching hospitals, including 3 tertiary care centers, a dedicated children's hospital,

and a community hospital. We approached the task of creating a consensus guideline for resident-as-teacher training programs based on our collective experience as medical education leaders and faculty experts in a variety of core educator roles, such as clerkship directors, residency program directors, fellowship directors, specialized education pathway directors, and vice chairs for education. The experts involved in the guideline creation were educators who led resident-as-teacher initiatives at their own programs. We used an informal expert consensus development process that involved 5 to 10 participants who met 4 times during the 2014–2015 academic year to arrive at a set of best-practice components that all participants agreed on through an iterative process of discussion, feedback, and revisions.

Data were synthesized by 3 investigators (B.A.M., H.A.R., T.A.C.) and presented at the meetings for consensus and aggregation. In addition to specific programs targeting residents, the group included items related to the overall teaching environment because faculty role modeling was thought to be a key aspect of fostering resident teaching skills. After finalizing the guideline, it was converted to an online survey in REDCap and pilot tested by several residency program directors not involved in its development.[12] Revisions were made based on feedback about clarity and length. To assess local practices regarding resident-as-teacher curricula, the survey was distributed from June through August 2016 using a link e-mailed to 47 residency program directors, representing 26 specialties at 5 affiliated teaching hospitals.

The institutional review board at Beth Israel Deaconess Medical Center (to whom other institutions ceded review) reviewed the study and deemed it exempt.

Descriptive analyses of survey responses were compiled for each item. Descriptive statistics were calculated using SAS 9.4 (SAS Institute Inc, Cary, NC).

Results

The final guideline included 26 items addressing components of curricula, educational climate, financial support, assessment, professional development for teaching faculty, and promotion for teaching (FIGURE).

Forty-nine percent of residency programs surveyed (23 of 47), representing 17 clinical specialties and all 5 hospitals, completed the questionnaire. TABLE 1 shows the number of programs in each specialty that were invited and responded to the survey as well as the proportion of respondents each specialty

What was known and gap
Residents are required to participate in the education of students, peers, and other health care professionals, but methods for assessing residents as teachers are limited, and it is difficult to discern optimal curricula for training residents as educators.

What is new
A consensus guideline to assess academic medical centers' resident-as-teacher programs and teaching environments.

Limitations
Reporting bias may have affected results of the survey, which was limited by a 49% response rate and lacked strong validity evidence.

Bottom line
A resident-as-teacher consensus guideline could provide a road map for educating residents and fellows as teachers.

represented. Specialties with the largest proportion of respondents reporting resident-as-teacher programs were internal medicine, adult neurology, obstetrics and gynecology, pediatrics, adult psychiatry, and general surgery (each formed 8.7%, 2 of 23 total respondents).

Results are summarized in TABLE 2. Many programs reported that greater than 50% of resident time was spent teaching medical students (22%, 5 of 23) or other residents (43%, 10 of 23) through clinical supervision and formal teaching. In terms of curricula, items included specific medical education curricula, grand rounds on medical education topics, evaluation of teaching by faculty and residents, special programs for residents interested in medical education careers, teaching awards, and support for faculty development as teachers.

The majority of programs (78%, 18 of 23) reported that residents were required to participate in an orientation to teaching. Residents were evaluated on teaching skills in 91% of residency programs (21 of 23), most frequently through direct observation (70%, 16 of 23), video assessment (26%, 6 of 23), and/or an objective structured teaching exercise (17%, 4 of 23). Advanced educational programs (including teaching tracks, mentorship, educational research support, interest groups, or trainee-initiated teaching programs) were noted by 91% (21 of 23) of programs. Teaching awards for residents and faculty were also given in 91% (21 of 23) of programs. All programs used evaluations of faculty teaching written by residents and medical students, which were linked to faculty annual reviews in 52% of programs (12 of 23). Only 22% of programs (5 of 23) reported that evaluations were linked to faculty promotion and salary.

The top 3 future professional development activities (ranked as most valuable from the items on the

Formal Curriculum	Culture and Learning Environment	Assessment
□ New trainee orientation for teaching role □ Overview of medical student curriculum □ Expectations for residents-as-teachers □ Introduction to clinical teaching □ Characteristics of effective teachers □ Adult learning theory □ Setting expectations and educational contracts □ Teaching in small groups □ Teaching in large groups □ Giving effective feedback □ Mistreatment/enhancing the learning environment □ Teaching clinical reasoning and critical thinking □ Teaching in the ambulatory setting □ Procedural teaching □ Bedside teaching □ Clinical skills teaching □ Hidden curriculum/modeling professionalism □ Challenging learning and teaching situations □ Teaching and assessing professionalism □ Grand rounds on education at least once per year	Special Teaching or Educational Offerings □ Specialized teaching track □ Mentorship program for trainees with educational leadership goals □ Educational research project support □ Trainee medical education interest group □ Trainee-initiated teaching programs □ Time and financial support for faculty and trainees to attend educational conferences (either locally at institution, regionally, or nationally) □ Academy of teachers within hospital or medical school for faculty and trainees to develop, award, and recognize teaching □ Department-based system for handling reports of mistreatment Faculty Compensation and Promotion □ Faculty financially reimbursed for teaching □ Written evaluations or faculty teaching linked to faculty promotion and salary Teaching Awards □ Department-based faculty awards for teaching residents □ Department-based faculty awards for teaching medical students □ Department-based resident awards for teaching other residents □ Department-based resident awards for teaching medical students □ Hospital-based teaching awards given to residents from rotating medical students □ Hospital-based teaching awards given to faculty from rotating medical students □ Other teaching awards	Trainees Evaluated on Teaching Skills □ By core faculty □ By residents/fellows □ By medical students Evaluation of Trainee Teaching Skills □ Objective structured teaching evaluations □ Video of teaching with feedback □ Direct observation of teaching with feedback □ Teaching evaluations used in semiannual trainee review meetings Faculty Evaluated on Teaching Skills □ By residents/fellows □ By medical students Faculty Development of Teaching Skills □ Workshops or didactics in medical education □ Peer observation of teaching available External Assessment □ External review of department's educational programs by consultants or invited faculty experts to ensure quality

FIGURE

Resident-as-Teacher Consensus Guideline

guideline) were providing residents with effective feedback on teaching, teaching active learning methods through higher order questioning, and enhancing resident small group teaching.

Discussion

We leveraged a multispecialty resident-as-teacher interest group of experienced medical educators to reach consensus on elements that would define a comprehensive resident-as-teacher program. The resulting guideline can be used by residency and fellowship training programs to develop new resident-as-teacher programming, evaluate current offerings, and further enhance the culture of teaching. It might also help medical schools and affiliated hospitals document resident-as-teacher programs for accreditation purposes.

Overall, program directors at 5 teaching hospitals reported a wide variety of offerings for training

TABLE 1

Responding Residency Programs

Specialty	Invited (No.)	Responded (No.)	Proportion of Total Responding (%)
Anesthesiology	3	1	4.3
Dermatology	1	0	0
Emergency medicine	2	1	4.3
Family medicine	1	1	4.3
Internal medicine	4	2	8.7
Internal medicine–pediatrics	1	0	0
Medical genetics	1	0	0
Neurological surgery	2	1	4.3
Neurology, adult	2	2	8.7
Neurology, child	2	1	4.3
Nuclear medicine	1	1	4.3
Obstetrics and gynecology	2	2	8.7
Orthopedic surgery	1	1	4.3
Otolaryngology	1	0	0
Pathology	3	1	4.3
Pediatrics	2	2	8.7
Plastic surgery	1	0	0
Psychiatry, adult	3	2	8.7
Psychiatry, child	1	0	0
Diagnostic radiology	3	1	4.3
Radiation oncology	1	0	0
General surgery	3	2	8.7
Thoracic surgery	2	0	0
Vascular surgery	1	0	0
Transitional year	1	1	4.3
Urology	2	1	4.3
Total	47	23	100

residents as teachers, many of which were well beyond that required by the Liaison Committee on Medical Education. Previous studies have shown that residents spend at least 25% of their time teaching, and medical students attribute up to two-thirds of their education to resident teaching.[13,14] Residents report that they enjoy teaching, consider teaching important, and think teaching improves their knowledge and skills.[9] In our study, the core specialties of internal medicine, adult neurology, obstetrics and gynecology, pediatrics, adult psychiatry, and general surgery had the highest proportion of respondents who reported current resident-as-teacher programs. This finding is similar to that of a national survey by Achkar et al[15] on the prevalence of resident-as-teacher programs, where the highest proportions of responding programs were in medicine (20.4%), pediatrics (15.4%), and emergency medicine (11.8%). Given the ACGME mandate, it is not surprising that residency core specialties are more likely to report having resident-as-teacher programs. In our study, there did not appear to be a difference in response rates between surgical and medical specialties.

Little published guidance is available regarding what components of resident-as-teacher curricula are considered best practices. The components of our resident-as-teacher guidelines need further validation beyond single institution expert consensus. Srinivasan and colleagues[16] described competencies for faculty who are medical educators, which included medical (or content) knowledge, learner centeredness, interpersonal and communication skills, professionalism and role modeling, practice-based reflection, and systems-based practice. The topics included in our guideline for training residents as teachers show considerable overlap with these. Developing a better understanding of the foundational skills necessary for success as a medical educator is an important advance that could result in the improved quality of teaching and enhanced

TABLE **2**

Guideline Item Responses

Guideline Item	Responding Programs, No. (%)
More than 50% of resident time spent teaching medical students	5 (22)
More than 50% of resident time spent teaching other residents	10 (43)
Residents required to participate in orientation to teaching	18 (78)
Residents evaluated on teaching skills	21 (91)
Direct observation	16 (70)
Video assessment	6 (26)
Objective structured teaching exercise	4 (17)
Presence of advanced educational programs	21 (91)
Awards for residents and faculty as teachers	21 (91)
Written evaluations of faculty teaching by both medical students and residents	23 (100)
Linked to faculty annual review	12 (52)
Linked to faculty promotion and salary	5 (22)

learner outcomes. Standardized tools to assess resident-as-teacher programs may help achieve this goal.

In addition to targeting residents, our guidelines addressed faculty programs to support and promote teaching effectiveness and a culture of teaching. Though all residency programs in our study reported that they evaluated faculty teaching skills, only half of these evaluations were linked to faculty reviews. An even smaller proportion of teaching evaluations were linked to academic advancement. Medical education has entered a new era in which residency program faculty are increasingly acquiring advanced educational skills and tools through both formal and informal means.[17] The hiring and promoting of faculty with core skills, grounded in the science of adult learning, should be recognized and valued. Our data suggest that there is an opportunity to further promote the institutional value and importance of teaching by including it in annual faculty reviews and universally considering it part of promotion and leadership roles.

Assessment of our survey data was limited by the 49% response rate. It is possible that nonrespondents were less likely to have formal resident-as-teacher programs or other key elements contributing to a robust educational culture. It is also possible that the length of the 26-item survey was burdensome to respondents, which may limit implementation. Reporting bias may have affected our results; we did not survey individual residents or faculty. Program directors may overestimate offerings or residents may not be aware of them. There is little validity evidence to support that the survey respondents interpreted the survey items as we intended. Additionally, the survey may not be comprehensive. We did not capture mandatory versus voluntary curricular elements, nor did we specifically look at dedicated

fellowship programs. Our study may not be generalizable to smaller programs without access to the same resources as our larger academic hospitals. Finally, the experts in the interest group who developed the survey were all from the same academic institution and may not reflect best practices in other areas of the United States.

Future directions may include looking at outcomes data to assess what aspects of the guideline are most closely linked to excellence in teaching skills and have the greatest impact when trainees go on to become faculty. We may also explore the generalizability of the guideline and the survey assessment through collaboration with other institutions in varied geographic and academic settings. This consensus guideline can be used as a template for the development and assessment of new and existing resident-as-teacher programs and curricula. These curricula may inspire further training in medical education skills for residents and fellows.

Conclusion

We have developed a consensus guideline for resident-as-teacher training that could serve as a road map for program directors and institutions to think broadly about how they educate residents and fellows as teachers.

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Bri Anne McKeon, MD*, is Assistant Professor, Department of Obstetrics and Gynecology, University of South Florida; **Hope A. Ricciotti, MD*,** is Associate Professor, Department of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center, and Department of Obstetrics, Gynecology, and Reproductive Biology, Harvard Medical School; **Thomas J. Sandora, MD, MPH,** is Associate Professor, Department of Pediatrics, Boston Children's Hospital; **Subha Ramani, MBBS, PhD, MPH,** is Associate Professor, Department of Medicine, Brigham and Women's Hospital; **Richard Pels, MD,** is Assistant Professor, Department of Medicine, Cambridge Health Alliance; **Eli M. Miloslavsky, MD,** is Assistant Professor, Department of Medicine, Massachusetts General Hospital; **Miriam J. Haviland, MSPH,** is Lecturer, Department of Obstetrics and Gynecology, Beth Israel Deaconess Medical Center, and Department of Obstetrics, Gynecology, and Reproductive Biology, Harvard Medical School; and **Tracey A. Cho, MD,** is Associate Professor, Department of Neurology, University of Iowa Hospitals and Clinics.

* These authors contributed equally to the work.