Medical Student Learning From Residents in the Workplace

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THESIS

Submitted as partial fulfillment of the requirements
for the degree of Master of Health Professions Education
in the Graduate College of the
University of Illinois at Chicago, 2012

Chicago, Illinois

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This thesis is dedicated to my beloved, Helen Schaub, who through her life inspires me to always learn and put my learning to meaningful use in the service of society.

ACKNOWLEDGMENTS

I owe a tremendous debt of gratitude to the members of my thesis committee – Dr. Ilene Harris who exemplifies the very highest standards of the profession and who instructed, guided and mentored me through this study; Dr. Alan Schwartz, a gracious and critical reviewer of my data and findings; and Dr. David Muller, who generously supported me, provided much needed encouragement and offered me an academic home at Mount Sinai.

This work would not have been possible without the medical students who so willingly gave of their time to share their experiences. I am deeply indebted to them. I am also grateful to my community of scholars and friends who supported me during this journey. Dr. H. Barrett Fromme, a dear friend, colleague and co-investigator, provided invaluable intellectual and emotional guidance. Dr. Danelle Cayea, Mr. Chad Duffy, Dr. Peter Gliatto, Dr. Hilary Sanfey and Dr. David Thomas all provided crucial advice and counsel. Thanks also to Ms. Janet Settle and Ms. Laura Schaaf of the MHPE program for the care and consideration they always showed me.

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LIST OF ABBREVIATIONS

ACGME	Accreditation Council for Graduate Medical Education
LCME	Liaison Committee on Medical Education
OMP	One-Minute-Preceptor
RAT	Resident-as-Teacher
SFDP	Stanford Faculty Development Program

SUMMARY

Purpose: To explore what third year medical students learn from residents and which teaching strategies are used by residents in their interactions with students in the clinical workplace environment.

Method: In this multi-institutional qualitative study between January and March 2012, the authors conducted focus groups with medical students who were mid-way through their third year. Qualitative analysis was used to identify themes.

Results: Thirty-seven students participated. Students contributed 228 comments related to teaching methods used by residents. The authors categorized these into 20 themes within 7 domains including Role-Modeling, Focusing on Teaching, Creating a Safe Learning Environment, Providing Experiential Learning Opportunities, Giving Feedback, Setting Expectations and Stimulating Learning. Role-Modeling, the most frequently classified method of teaching in this study, was not included in the three most popular "Resident-as Teacher" (RAT) models. Strategies such as offering opportunities for safe practice, involving students in the team and providing experiential learning opportunities were not emphasized in these models. 197 student comments representing the knowledge and skills students learned from residents were categorized into 33 themes within 9 domains including Patient Care, Communication, Navigating the System, Adaptability,

Functioning as a Student/Resident, Life-Long Learning, General Comments, Career/Professional Development and Medical Content. Most areas are not emphasized in popular RAT models.

Conclusions: Residents serve as critical teachers of students in the clinical workplace. Current RAT models are based largely on the teaching behaviors of faculty. The content and teaching strategies identified by students in this study should serve as the foundation for future RAT program development.

Background

Lave and Wenger's situated learning theory suggests that learning is inextricably tied to its context and to the social relations and practices therein [1]. More broadly, this social learning theory focuses on learning through socialization into communities of practice and the impact of such engaged learning on the professional development and growth of the learner. In education for the professions, learning in the practice settings of the workplace is perhaps the signature pedagogy [2]. When applied to medical students, this learning theory suggests that clinical experiences such as clerkships provide for the beginning of entry into the professional community of medicine [3]. The clinical setting provides an environment where students can build upon their knowledge through learning in the workplace, as they develop an appreciation of the patient experience, integrate into the health care team and develop the necessary knowledge and skills for practice. In addition, students experience professional socialization as they enter into the community of practice, through observation, coaching, supervision and mentoring by their educators [2]. Many of these necessary skills and qualities are *only* expressed in practice and hence, in the clinical environment, the community of practice becomes the learning resource for the student.

Yet, the shift from predominantly classroom-based learning in the first and second years of medical school to clinical and bedside learning in the clerkships can be challenging for students. Despite curricular initiatives at many schools to reduce student stress through transition courses [4], studies have documented high levels of anxiety among medical students in the third year related to issues of adjusting to the clinical culture, understanding roles and responsibilities and performing clinical skills [3, 5-7].

The transformation of students into physicians requires the engagement of teachers who not only supervise students in their development of technical skills and applied knowledge but also serve as role models of the values, attributes, and life of a professional [8]. Residents, in particular, play a critically important role for medical students in the clinical environment [9, 10]. In addition to being most directly involved in caring for hospitalized patients at academic medical centers, they arguably spend the most time in direct contact with clerkship students. In a study by Barrow in 1966, medical students claimed that up to a third of their education was provided by residents [11]. Two follow-up studies in 1976 and 1992 confirmed this finding [12, 13] and, in a more recent study, medical students indicated that residents were their most important teachers on the wards [14]. Residents,

themselves, saw teaching medical students as one of their primary responsibilities and estimated that they spent up to 25% of their time teaching [15]. To that end, residents desired formal instruction in methods to improve their teaching skills [9].

Residents, however, face tremendous pressures in the current training environment. The rapid pace of clinical medicine, coupled with ACGME work hour regulations have residents struggling to balance their clinical, teaching and supervisory responsibilities. As a result, and in recognition of the important role residents play as teachers, accrediting bodies, including the LCME [16] and ACGME [17] have emphasized the need for programs to develop resident knowledge and skills in teaching.

“Resident-as-teacher” (RAT) programs were developed to address this critical need and as of 2001, 55% of U.S. residency programs provided some instruction on teaching for their residents [18]. However, courses vary considerably in terms of instructional methods, length, format and content [18-20]. This variability has prompted calls for programs tailored to the unique needs of residents and for “more critical evaluation to define the high priority areas in resident teacher training” [21]. With respect to content in

particular, a review of the literature indicates that reported RAT programs across the country predominantly emphasize the One-Minute Preceptor model [22], the Stanford Faculty Development Program's clinical teaching framework [23, 24] or domains shown to be essential for clinical teaching excellence by Irby et al [25]. Importantly however, actual teaching strategies included in these models are based on teaching behaviors of distinguished clinical faculty [25], derived from observations of faculty [25-28] or designed for use by faculty in encounters with residents [22]. None of the models focus on content students actually learn from their residents or include behaviors specifically identified by students as being effective teaching strategies utilized by resident teachers.

In 1997, Skeff et al argued that teaching-improvement courses should have characteristics consistent with empirical studies on effective methods and be designed to address features of the teaching role most commonly played by participants [29]. Despite this call and the central role of residents in the workplace education of medical students, to our knowledge, no studies have explored in depth what third year medical students learn from residents and which teaching strategies are used by residents in their interactions with students. We sought to address these important questions in the hopes that

our findings could help focus the content and teaching strategies emphasized in RAT programs.

Methods

To increase the general applicability of our results, we selected three U.S. medical schools with geographic and size diversity but with similar curricular structures including two preclinical and two clinical years: Mount Sinai School of Medicine (R.K., D.M.), University of Chicago Pritzker School of Medicine (H.B.F.) and Johns Hopkins University School of Medicine (D.C.). We obtained IRB approval at each institution as well as at the University of Illinois, Chicago College of Medicine, as this was the site of two authors (A.S. and I.H.) who assisted in study design and data analysis. The study was conducted between January and March 2012.

We conducted focus groups with medical students who were mid-way through their third year, to obtain the perspectives of students who had sufficient time to experience the clinical workplace environment and reflect upon their learning in these venues. Specifically, we invited those who had completed their Surgery and either their Internal Medicine or Pediatrics clerkships to provide purposeful sampling of students who had finished the

clerkships that were most dissimilar in terms of culture and tasks (procedural versus non-procedural).

Previous studies of learners' perceptions about clinical teaching required them to respond to researcher-generated lists of hypothetically important qualities or skills of the clinical teacher role [30, 31]. However, this use of lists to rank, rate or select from may prevent the discovery of qualities and skills important to students but not on the lists [32], and hence for this study we chose to conduct focus groups to allow for open-ended questions, exploration of ideas and clarification of statements.

Students were invited by email to participate in the focus groups. Two (2), hour-long focus groups of 6-12 students, each, were conducted at each site. No compensation was offered or provided. Student gender, age and career plans were obtained in a de-identified manner at each focus group session. Using a semi-structured facilitator guide, investigators asked open-ended questions designed to explore students' learning experiences with residents during the third year. While focus groups were conducted independently at each site by the site investigator, in advance of the sessions investigators reviewed approaches to group facilitation to create as much consistency

across sites as possible. The three focus group questions relevant to this study were:

a. Describe the type of things you have learned from your residents during your clerkships

b. What do you view as the most important things you learned from your residents this year?

c. Describe the qualities and skills that make a great resident teacher for medical students in the clinical workplace environment.

Each focus group was audio recorded and transcribed verbatim in a de-identified manner. Audiofiles were then destroyed. All qualitative data were analyzed using the constant comparative method associated with grounded theory [33]. Content units for analysis were words and phrases. Two coders (R.K and H.B.F) independently identified themes for the first three focus groups. The coders then estimated inter-coder reliability and reached consensus on themes through discussion. Prior to discussion, inter-coder reliability was 88% and following discussion, agreement was 100%. Coding of the last three focus groups was then divided between the two authors. Focus group data were evaluated for trustworthiness using member-checking, in which student participants were asked to review transcripts for accuracy and themes for effectiveness in capturing their perspectives.

Following coding, themes were triangulated using available published literature on clinical teaching and RAT programs to allow for an analysis of similarities and differences between our study findings and other available data and perspectives.

Results

Thirty-seven (37) students participated in the focus groups across all three sites. Nineteen (19, 51%) were male and 18 (49%) were female with a mean age of 26.6 years (range 24-33). While 19 students (51%) were undecided about their career choice, 8 indicated Internal Medicine, 4 Pediatrics, 2 Anesthesiology and 1 each Emergency Medicine, Radiology, Surgery and Plastic Surgery.

Teaching methods used by residents

We categorized 228 comments into 20 themes representing the methods used by residents to teach students in the clinical workplace environment (Table I and Appendix 1). These 20 themes were then organized into 7 domains including Role-Modeling, Focusing on Teaching, Creating a Safe Learning Environment, Providing Experiential Learning Opportunities, Giving

Feedback, Setting Expectations and Stimulating Learning.

The domain of Role-Modeling, or learning through observation and reflection, accounted for 28% of all comments (63/228). The theme Role-Modeling/By Example-Generally (47/63, 75%) included comments such as residents taught “more by-example than by explicit stating,” “naming and identifying what they were doing” and “[through] how they work.” Teaching “by-example” facilitated students’ learning of communication skills, adaptability, life-long learning and patient care. Residents’ Admitting Limitations (7/63, 11%) was another theme in this domain, with one student commenting that she learned when residents were “[being] honest with students about what [they] know and what [they] don’t know.” Applying Knowledge to Clinical Care (5/63, 8%), i.e., the process of making knowledge relevant to the daily practice of caring for patients was another theme in this domain. One student stated, “Presenting from the patient perspective or from the symptom helped us apply what we learned in the first two years.” Finally, Advocating for Patients (4/63, 6%) rounded out the themes in this domain. Students learned from residents who “push[ed] to get something done [for the patient].”

Focusing on Teaching accounted for 21% of comments regarding methods used by residents to teach (49/228). Within this domain, comments were most frequently classified (24/49, 49%) as Finding Teachable Moments, i.e., the effective use of unplanned or informal opportunities in the busy clinical environment to teach. Students commented on residents' abilities to teach "on the fly," "even while they are working," and "see opportunities as potential teaching moments." Taking Time to Teach was also identified as a theme in this domain (16/49, 33%). Students commented that residents "set aside some time to teach," even though they were busy. Showing Interest in Teaching was the final theme in the domain, Focusing on Teaching (9/49, 18%). "Someone who sees part of their role as teaching the medical student" is one example of a student comment within this theme.

Creating a Safe Learning Environment, i.e., establishment of a supportive climate to facilitate learning, accounted for 19% of all responses (44/228). The first theme in this domain, Offering Opportunities for Safe Practice, relates to experiences students were afforded by residents to practice and make mistakes in a non-threatening environment (14/44, 32%). Students commented that "it felt safe…because practicing before-hand let us test stuff out" and "[they] were given the freedom to be wrong."

The second theme in this domain, Establishing Rapport with Students focused on efforts by residents to build relationships with students (10/44, 23%). For example, a student commented, “To me the best residents are those that are actually interested in your life. It’s not like they need to be your best friend, but they care, and they’re people.” Offering Reassurance is a theme focusing on allaying students’ fears and concerns about their knowledge and confidence in the clinical workplace environment (8/44, 18%). Students commented that residents made them believe they “have potential” by encouraging them (“It’s the residents who make you feel…you’re going to improve and learn”) and empathizing with them (“We all started from nowhere. Everyone had their first day on rotation”). Another theme in this domain was Creating a Sense of Team through leadership and involvement (6/44, 14%). One student commented, “[Residents] have these really sick patients and they’d figure out who needed to do what early in the day. It was really cool to come back together at some point and all of us would say what we did and the whole thing would come together.” Comments in the theme, Being Open to Questions, were made nearly as frequently by students (5/44, 11%). Students approached residents because they felt comfortable “going to [them] with questions because we know [residents] weren’t too far from [our] shoes.” Comments in the theme, Using Humor were the least frequent in this domain (1/44, 2%).

Providing Experiential Learning Opportunities, i.e., ways for students to learn by doing and becoming involved, accounted for 11% of student comments (26/228). Through Providing Experiential Learning Opportunities-Generally, residents facilitated student participation in experiences such as procedures, examinations or literature searches (12/26, 46%). Students could make meaning from these direct experiences; as one student stated, “I learned a lot more from being allowed to do something, by working it out by myself rather than just being told how it happens. Residents let me try and that learning really stuck.” Giving Opportunities for Ownership of Patients was the second theme in this domain (7/26, 27%). A student commented, “[By residents] giving [us] the responsibility…you feel the motivation to think about, what do I want for this patient?” Involving Students in the Team was mentioned as frequently by participants (7/26, 27%). A student stated, “I think learning can occur much more naturally when the student is made to feel welcome and a part of the team.”

The domain, Giving Feedback accounted for 10% of student responses (23/228). Students commented that “feedback is absolutely critical at our point” and that residents who “took the time to think about [their] work and performance” provided “feedback the way it should be.”

Setting Expectations, comprising statements related to clarifying student roles and performance standards, accounted for 5% of comments (12/228). The theme Setting Expectations for Student Performance (8/12, 67%) included student comments about “[getting] clear expectations” from residents. Explaining Student Role Explicitly was the second theme in this domain (4/12, 33%). One student commented, “[Residents] know that if we learn how things work and what our role is then their life is easier. It helps us and it helps them.”

Stimulating Learning, i.e., encouraging students to take control of their own learning, was the final domain related to this question and accounted for 5% of respondents’ comments (11/228). The theme Challenging Students to Learn (8/11, 73%) comprised comments such as, “Residents “challenge[d] me to think not only about what’s going on….but what the next steps are and should be” and “pushed [me] toward the next level even if [I] didn’t know what to do.” The second theme in this domain, Directing Students to Seminal Literature included comments about residents directing students to the current medical literature (3/11, 27%) as reflected in this quote, “My residents pointed me toward a lot of seminal literature.”

Knowledge and Skills Learned from Residents

We categorized 197 comments into 33 themes representing the knowledge and skills students learned from residents in the clinical workplace environment (Table II and Appendix 2). These 33 themes were organized into 9 domains including Patient Care, Communication, Navigating the System, Adaptability, Functioning as a Student/Resident, Life-Long Learning, General Comments, Career/Professional Development and Medical Content.

Patient Care, i.e., the knowledge and skills pertaining to direct clinical practice and patients, accounted for 26% of comments in response to this question (52/197). The first theme in this domain was Linking Knowledge to Clinical Care (16/52, 31%) which included comments focused on the application of knowledge to actual patients. One student stated, "[Residents] taught me how to explain findings and link my formal knowledge of pathophysiology to the clinical case." Clinical Reasoning, i.e., how to discern the relevance of data and reason through cases and hypotheses, elicited the next greatest number of comments in this domain (9/52, 17%). Students learned how to "[be] rational about…why you go down certain paths with the information you are given." The next theme in this domain was "Managing Patients" (8/52, 15%); a representative comment was, "What steps are needed for management on a daily basis." Physical Exam Skills was another

theme (7/52, 13%) in the Patient Care domain as was Prioritizing, i.e., learning how to reorganize work based on importance (7/52, 13%). One student commented that residents taught her “What’s the most pressing, urgent issue.” Students also learned the Logistics of Doing Procedures (3/52, 6%) which involved the practical aspects of tasks including how to “get the materials, assemble it,” and “how do you actually do that and what are the steps?” History-Taking Skills and Reassurance and Empathy Toward Patients rounded out the themes in this domain (1/52, 2%).

Communication was the second domain and accounted for 21% of all comments (42/197). Interacting with Others was the first theme in this domain (22/42, 52%) and students learned “how to interact with other professionals,” and “what was socially appropriate to say and how to interact.” Presenting Cases was another theme in this domain (9/42, 21%) and while most students learn case presentation skills prior to their clinical clerkships, our respondents emphasized that residents helped them focus their presentations on “what’s important” and “clinically relevant.” Calling for Consults (5/42, 12%) and Writing Patient Notes (4/42, 10%) were two additional themes in this domain. One student commented that “there’s a certain skill in getting a good response on a consult, and I think residents have been great about teaching us how to do that”, while another

commented that residents “helped me a lot with my notes.” Giving Sign-Out, i.e., how to hand-over patients during transitions, rounded out the themes in this domain (2/42, 5%).

Navigating the System, i.e., the logistics, hierarchy and division of labor in the complex clinical environment, accounted for 15% of student responses (30/197). The first theme in this domain, Getting Things Done on the Floor, relates to the practical steps involved in clinical care (14/30, 47%). One representative comment was, ”You take the patient into the OR and you have to be with them the whole time, and then…you put the Foley in and you put their compression boots on.” How the System Works in the Hospital was the next theme in this domain and focused on learning how things function in hospitals (7/30, 23%). Since students are new to the clinical environment, residents help them “get acclimated to working in the hospital.” What is the Hierarchy, i.e., knowledge related to the chain of command, was another theme (5/30, 17%) and students “look[ed] to residents just to understand that.” Finally, residents taught students Who to go to for Things (4/30, 13%), including practical tips on who is responsible for what and “who to ask a certain question of.”

Comments related to Adaptability, i.e., the ability to cope and adjust to changes or challenges, accounted for 11% (22/197) of all responses. Within this domain, students learn about Balancing Work and Life from their residents (7/22, 32%). As one respondent commented, “You see…how they balance their lives during residency and you see that they still sometimes go out and have fun and things like that.” Responding to Stress, i.e., how residents cope with the many pressures they face, was another theme (6/22, 27%) in the domain of Adaptability. Students observed that “[Residents] have so much to do and they’d stop to laugh and kid around. I thought that was amazing because otherwise the stress would get to you for sure.” Responding to Criticism and Feedback was also identified as a theme in this domain (4/22, 18%). Students commented that “the way [residents] respond to feedback [served] as a model for how you might be able to take it or respond to it.” Thinking and Responding Quickly, i.e., the process of reacting in the moment when necessary (3/22, 14%), included student comments such as “how to think on your feet.” Finally Developing and Modifying a Routine, i.e., the process of creating and adapting a work routine in the demanding clinical workplace environment (2/22, 9%) was the final theme in this domain.

Functioning as a Student/Resident accounted for 10% of comments (19/197). Roles and Expectations of Students is the first theme in this domain (9/19, 47%) and students commented that residents "explained what [the student's] role should be" and "set expectations." How to Function as a Resident is a theme related to learning the expectations and responsibilities of residents (8/19, 42%). As one student commented, "[Residents] also gave me advice that taught me how to function like a resident, even though I'm still only a student." The final theme in this domain, Transitioning from Preclinical to Clinical Environment pertains to students learning how to adjust to the new learning environment of the clinical workplace from residents (2/19, 11%). As commented by one student, "I've also learned about transitioning from pre-clinical to clinical. I think that's one of the skills that the residents remember better than anyone else, and so they're able to speak in the manner of, you know, 'When I did this transition…' or, 'when I was on my surgery clerkship this is what I did'."

Life-Long Learning, i.e., the knowledge and skills required to become continuous learners, accounted for 5% of comments (9/197). Self-Directed Learning, i.e., taking control of one's own learning, was the first theme in this domain (4/9, 44%). Students gained skills in "how to be professionally curious," and "how to learn new [topics]." Finally, Technology to Use at the

Point of Care, related to learning about technological resources available to guide care (3/9, 33%) and being directed by residents to Reading the Seminal Literature, were the final two themes in the domain of Life-Long Learning.

General Comments accounted for 5% of comments in response to this question (9/197). What Not to Do included lessons students learned about how not to behave in the future (5/9, 56%). One student stated, “then there are residents that are…not good with patients. I was like okay, I’m not going to be like that. I will be the opposite of that.” The theme What to Do included positive behaviors learned from residents (4/9, 44%) as reflected in this statement by a student, “there were behaviors I learned….that I want to emulate”.

Career/Professional Development, accounted for 4% of student comments (7/197). The Career Development theme focused on knowledge related to the next steps in training and career paths in medicine (4/7, 57%). As one student commented, “The way I look at it, knowing what your eventual career is like is sort of like a step-wise process where it becomes gradually clearer. So the residents have one clearer step than us…like what our lives are actually going to be like when we finish school. So it’s good to get

perspective from around the bend that you might not otherwise have." The final theme in this domain, Culture of Different Fields, included gaining perspectives from residents about various specialties (3/7, 43%). One student commented, "Learning the actual cultures of different specialties. You hear about stuff like that before you start but you don't really know it until you see it and hear it."

The final domain, Medical Content, also accounted for 4% of student comments (7/197). This domain included learning related to general medical knowledge such as "general antibiotic review," or "shortcut diagrams for lab values."

Discussion

This study is, to the best of our knowledge, the first to qualitatively explore the perspectives of third year medical students across multiple institutions regarding teaching strategies employed by their resident educators and content they learned from residents in the clinical workplace environment.

Residents serve as essential teachers of medical students during clinical training and contribute in ways that are unique and complementary to the

contributions of attending physicians [21]. In recognition of this important role played by residents and in response to accreditation mandates to offer teacher-training, RAT programs continue to grow across the country. However, programs vary considerably and focus on content and teaching strategies largely derived from studies of faculty educators. Our study identifies particular teaching methods employed by resident educators that are unique from and underemphasized in previously known models of clinical teaching. In addition, our findings clarify exactly what students learn from residents in the clinical workplace environment and challenge an assumption that the content students learn from faculty and residents is the same.

Resident teaching strategies we identified fall into a model that includes 7 domains and 20 themes. Among these strategies are those that have not been emphasized or identified previously in models including the OMP, Irby's framework and the SFDP Clinical Teaching Program. The OMP model, originally designed for use by faculty preceptors with residents in busy ambulatory practices, includes teaching behaviors to understand the decision-making process used by the resident [22]. The five micro-skills that comprise this model include encouraging the learner to make a commitment to a diagnosis or plan, asking for evidence to support the commitment, providing general information based on gaps or mistakes, offering positive

feedback and correcting errors through constructive feedback. While this framework may facilitate teaching around a patient encounter, its applicability to the myriad other learning interactions students have with residents is less clear. As a result, giving feedback is the one teaching strategy theme identified in our study that maps directly to the OMP model.

Irby's model of clinical teaching excellence includes domains of knowledge utilized by distinguished faculty in general internal medicine in the context of teaching rounds [25]. Clinical knowledge of medicine, patients and the context of practice, as well as educational knowledge of learners, general principles of teaching and case-based teaching scripts comprise the six domains and together allow faculty to target teaching to the needs of their learners. While some of our teaching strategy themes, including showing interest in teaching, taking time to teach, giving feedback and establishing rapport with students can be classified under Irby's general principles of teaching category, others do not appear to fit. Methods such as offering opportunities for safe practice and ownership of patients, providing experiential learning opportunities and involving students in the team relate more to the longitudinal workplace-based experiences that students have with residents.

While many more of our teaching strategies can be placed under the SFDP general domains, many of these themes do not match the descriptive statements in the validated SFDP Clinical Teaching Instrument (Table III). While the SFDP framework was based on education and psychological theories of learning and empirical observations of clinical teaching [23, 24], the SFDP Clinical Teaching Instrument statements relate more to formal teaching sessions. Particular themes from our study such as offering opportunities for safe practice, involving students in the team, finding teachable moments and providing experiential learning opportunities, however, apply more to teaching and learning strategies in a work place environment rather than to a formal teaching session.

Role-modeling is the most frequently classified method of resident teaching in our study. This important theme does not fit into any of the three popular RAT models. Although learning from role-models involves a complex mix of conscious and unconscious activities [34], students offered numerous comments about learning through observation of and reflection on their residents' behaviors. Two previous, small studies have identified the importance of role-modeling as a teaching strategy. One found resident behavior to be more instructive to medical students than mere provision of facts during work rounds [35] and another study of 72 students on their

inpatient Medicine rotation found that perceived teaching effectiveness for residents correlated most strongly with being a role model [36]. Our findings highlight just how important role-modeling is in medical student clinical workplace learning. RAT programs should, therefore, include strategies identified in the literature to actively prepare for such teaching through conscious recognition of the importance of role modeling as a teaching strategy, making the implicit explicit, whenever possible, by articulating what is being modeled and facilitating reflection on clinical experiences and on the behaviors and attributes being demonstrated [34, 37].

We also identified several teaching strategies that warrant greater emphasis in RAT training programs. For example, finding teachable moments was an important theme that was identified in our study. Prior studies have shown that residents enjoy teaching and consider it to be a critical component of their own experience and education [9]. However, given the multiple competing demands they face, it is unrealistic to expect residents to devote more time to student teaching. Therefore, offering residents training on how to adapt teaching to the clinical workplace environment by “thinking out loud” and “teaching while working” are critical in resident teacher training programs.

Offering opportunities for safe practice was identified as another important teaching technique identified by students. In order for students to absorb and be absorbed into the professional culture, they must be afforded opportunities to observe, perform basic tasks and learn the practices of the profession [38]. At the same time, research has shown that the process of acculturation is a difficult one for students as they struggle to adjust to the clinical environment and learn their roles and responsibilities [3]. Therefore, teaching residents how to offer students opportunities to practice their knowledge and skills in a non-threatening environment is crucial.

Yet another effective strategy employed by resident teachers in our study is providing experiential learning opportunities for students. In the process of “learning by doing,” students participate in and acquire the knowledge and skills required for practice. Moreover, through such active engagement, novice students move from the periphery of the community of practice towards the center. This contextual learning also allows students to gain confidence and strive towards more responsibility.

This study also identified the knowledge and skills students gained from their resident educators in the clinical environment. Students turned to their residents to learn active patient management skills, communication skills,

how to navigate the complex clinical work-place environment, how to adjust and adapt, and roles and responsibilities. Notably, these content areas do not feature prominently in any of the three popular RAT models. In the OMP model, the five “micro-skills” stimulate learners to commit to and defend a diagnosis or plan [22], while the SFDP framework and instrument [23, 24]appear to fit formal clinical-content presentations better. Finally, Irby’s model emphasizes knowledge of medicine, patients and the context of practice among key domains of clinical teaching excellence [25].

Our findings about what students learn from residents are more consistent with previous research exploring students’ perceptions of the transition to clerkship years. A study by O’Brien et al found that logistics and adjusting to the culture of patient care in different specialties (including how to manage patients and problems, how to communicate appropriate information and to contribute to patient care in different settings, and what student roles and responsibilities are) were among the most prevalent struggles faced by students entering the clerkship years [3]. Our results indicate that residents are the teachers students turn to in the clinical workplace to address these important learning needs. Finally, student comments about what they learned from residents were least frequently classified as relating to medical content or general medical knowledge. While medical knowledge is critical

for outstanding clinical care, perhaps this student need is fulfilled by attending physicians or clerkship didactics rather than by residents.

There are several limitations to this study. Three different investigators led the focus groups and while we strove for consistency in questioning and facilitation style, there may have been differences that influenced students' comments. We focused on third year students who had completed some of the longest and most dissimilar inpatient clerkships in terms of culture and tasks. The generalizability to residents in other fields and to outpatient settings may, therefore, be limited. Finally, we did not include residents in this study and their perspectives may be a powerful way to capture the congruence between opinions on these important topics.

Conclusions

For medical students, the clinical clerkships provide the beginning of entry into the professional community. In this busy clinical work-place environment, students are expected to learn skills, professional behaviors, attitudes and values. The transition from preclinical training to the clinical years can, however, be very stressful for students as they determine their role, adjust to the culture of practice, adapt to new ways of learning and

navigate the complex system. Residents spend the most time in direct contact with third year students and serve as their primary teachers during clerkships. Programs developed to enhance the teaching skills of residents have, thus far, focused on models derived largely from the teaching behaviors of faculty in formal teaching encounters. We propose that together with teaching strategies utilized by residents, those content areas that have been identified by students as specific to what they learn from residents, serve as the foundation for RAT program development in the future. Not only will this address students' concerns about learning the clinical workplace environment but it will also allow for more targeted and efficient teaching by busy residents.

Table I: Domains and Themes of Teaching Methods Used by Residents

Domains and Themes	**Number of Comments in Domain (% of Comments in Domain)**	**Total Number of Comments (% of Overall Comments)**
Role modeling		63 (28)
Role Modeling/by Example-Generally	47 (75)	
Admitting Limitations	7 (11)	
Applying Knowledge to Clinical Care	5 (8)	
Advocating for Patients	4 (6)	
Focusing on teaching		49 (21)
Finding Teachable Moments	24 (49)	
Taking Time to Teach	16 (33)	
Showing Interest in Teaching	9 (18)	
Creating safe learning environment		44 (19)
Offering Opportunities for Safe Practice	14 (32)	
Establishing Rapport with Students	10 (23)	
Offering Reassurance	8 (18)	
Creating a Sense of Team	6 (14)	
Being Open to Questions	5 (11)	
Using Humor	1 (2)	

Providing experiential learning opportunities		26 (11)
Providing Experiential Learning Opportunities-Generally	12 (46)	
Giving Opportunities for Ownership of Patients	7 (27)	
Involving Student in the Team	7 (27)	
Giving feedback	23 (100)	23 (10)
Setting expectations		12 (5)
Setting Expectations for Student Performance	8 (67)	
Explaining Student Role Explicitly	4 (33)	
Stimulating learning		11 (5)
Challenging Students to Learn	8 (73)	
Directing Students to Seminal Literature	3 (27)	
Total number of comments		228 (100)

Table II: Domains and Themes of Knowledge and Skills Learned From Residents

Domain and Theme	Number of Comments in Domain (% of Comments in Domain)	Total Number of Comments (% of overall comments)
Patient Care		52 (26)
Linking Knowledge to Clinical Care	16 (31)	
Clinical Reasoning	9 (17)	
Managing Patients	8 (15)	
Physical Exam Skills	7 (13)	
Prioritizing	7 (13)	
Logistics of Doing Procedures	3 (6)	
History-Taking Skills	1 (2)	
Reassurance and Empathy Toward Patients	1 (2)	
Communication		42 (21)
Interacting with Others	22 (52)	
Presenting Cases	9 (21)	
Calling for Consults	5 (12)	
Writing Patient Notes	4 (10)	
Giving Sign-Out	2 (5)	
Navigating the System		30 (15)
Getting Things Done on the Floor	14 (47)	

How System Works in the Hospital	7 (23)	
What is the Hierarchy	5 (17)	
Who To Go To For Things	4 (13)	
Adaptability		22 (11)
Balancing Work and Life	7 (32)	
Responding to Stress	6 (27)	
Responding to Criticism and Feedback	4 (18)	
Thinking and Responding quickly	3 (14)	
Developing and Modifying Routine	2 (9)	
Functioning as a Student / Resident		19 (10)
Roles and Expectations of Students	9 (47)	
How to Function as a Resident	8 (42)	
Transitioning from Preclinical to Clinical Environment	2 (11)	
Life-Long learning		9 (5)
Self-Directed Learning	4 (44)	
Technology to Use at the Point of Care	3 (33)	
Reading the Seminal Literature	2 (22)	
General comments		9 (5)
What Not To Do	5 (56)	
What To Do	4 (44)	
Career / Professional Development		7 (4)
Career Development	4 (57)	
Culture of Different Fields	3 (43)	

Medical Content	7 (100)	7 (4)
Total Number of Comments		197 (100)

Table III: Mapping of teaching strategy themes from this study to the SFDP Framework

Stanford Faculty Development Program Domain	General Description	Validated Stanford Faculty Development Program Clinical Teaching Instrument Statements	Themes from this study
Learning Climate	Tone or atmosphere of the teaching environment	Listened to learners Encouraged learners to participate actively in discussion Encouraged learners to bring up problems	Admitting limitations Showing interest in teaching Offering opportunities for safe practice Establishing rapport with students Using humor Involving student in the team Being open to questions Taking time to teach
Control of session	Approaches teacher uses to focus and pace a teaching interaction	Called attention to time Avoided digressions Discouraged external interruptions	Finding teachable moments
Communication of goals	Process by which teachers establish and communicate expectations for students	Stated goals clearly and concisely Stated relevance of goals to learners Prioritized goals	Setting expectations for student performance Explaining student role directly

		Repeated goals periodically	
Promoting understanding and retention	Use of teaching methods to enhance understanding and retention	Presented well organized material Explained relationships in materials Used blackboard or other visual aids	Providing experiential learning opportunities Giving opportunities for ownership of patients
Evaluation	Process teacher uses to determine whether learners are achieving desired goals	Evaluated learners' knowledge of factual medical information Evaluated learners' ability to analyze or synthesize medical knowledge Evaluated learners' ability to apply medical knowledge to specific patients Evaluated learners' medical skills as they apply to specific patients	
Feedback	Process teacher uses to provide information to the learners about their behavior to improve their performance	Gave corrective feedback Explained to learners why he/she was correct or incorrect Offered learners suggestions for improvement Gave feedback	Giving feedback

		frequently	
Self-directed learning	Process teacher uses to encourage learners to continue learning	Explicitly encouraged further learning Motivated learners to learn on their own Encouraged learners to do outside reading	Directing students to seminal literature Challenging students to learn

Appendix 1: Teaching Strategies Used by Residents

Domain (no. of comments) **Description**	**Theme (no. of comments)**	**Representative comments**
Role Modeling (63) Sets an example through behaviors and actions		
	Role Modeling/By Example-Generally (47)	-"It was modeling, mostly. I watched them. My presentations changed within a week just because I was, "'Well, they're not saying this, and this isn't being done.'" I literally would adapt." -"Watching them has taught me a lot about what to do and how to behave." -"They are some very good role models, where you can look to them and what they do and say, "'Oh well, this is how I should handle a particular situation'"." -"They taught by example, like what to do with patients and attendings."
	Admitting Limitations (7)	-"If you're comfortable with yourself, if you're honest with your students about what you know and what you don't know."

		-“Self confidence to be able to not know something and be okay with that is a really important trait.” -“When people said that they didn’t know the answer or what to do.”
	Applying Knowledge to Clinical Care (5)	- [The resident] “presented from the patient perspective or from the symptom [which] helped us apply what we learned in the first two years.” -“He’d guide me and say “’Study this tonight. Focus on this one thing’” and then the next day we’d talk about it and try to apply it to the patient.” -“There were some who said, “’I’m going to make two or three points, and I want you to remember these two or three points from this patient’”.”
	Advocating for Patients (4)	- [The resident said] “’We’re going to take the steps to go and get these things and do it for the patient’”.” -“I saw my residents play different roles. Like pushing to get something done [for the patient] even when the other person on the phone clearly didn’t care.”
Focusing on Teaching (49) Is deliberate		

about and demonstrates a commitment to and interest in teaching		
	Finding Teachable Moments (24)	- [The resident would say] “’Hey let’s discuss this for a moment, this person had this finding, what do you think of that’”?” -“Going through the patients that you have, that you’re working on…going through some of the decision points and asking, “’If this patient had this finding, then what would we have done’”?” -“One who talks through what they’re doing when there’s a student in the room.” -“They find something to teach even while they are working.” -“They’ll be, “’I’m ordering a cephalosporin. Why am I doing that?’” as they’re typing in the cephalosporin.”
	Taking Time to Teach (16)	-“I think those [residents] who make a consistent effort to specifically set time for teaching give you consistently better teaching.” -“And they just sat down with us, and it was just one of the senior residents and us…just setting aside that time in their schedule and making sure we set it aside in ours.”

		-“They would still [even though they were busy] kind of set aside some time to teach you something.”
	Showing Interest in Teaching (9)	-“Someone who sees part of their role as teaching the medical student.” -“Residents who are enthusiastic are better teachers.” - “[Those who] actually care to want to teach you a little bit.” -“The resident who takes the initiative to teach the student.”
Creating Safe Learning Environment (44) Actively facilitates an atmosphere that is not-threatening, open and conducive to learning		
	Offering Opportunities for Safe Practice (14)	-“I think it helps so much when you sit down, right before you leave the night on call and you just talk out real fast what’s really important to help in attending rounds tomorrow morning.” -“It felt safe with her because practicing before-hand let us test stuff out and then feel more secure later. She made trial and error okay and it gave me a true sense of her

		skills as an educator. Who doesn't want to practice to get better and not get chewed out when it is about patients?" -"She was like "'Okay, every morning before you present to the group, just run it by me and we'll talk'"." -"It's almost exactly like learning a foreign language, where you have to start speaking in situations where you can't say it right now. And then you get it wrong and someone's, "'I have no idea what you're talking about.'" You feel a little silly, but only by getting it wrong in a safe space do you get it right eventually."
	Establishing Rapport with Students (10)	-"They were kind of quietly looking out for you and setting you up for success. And I think that kind of just goes to treating people with respect and dignity." -"I have residents who also would have us introduce ourselves as med[ical] students, talk about where we were from, what we like, and actually wanted to get to know us as people. That made me realize that, okay, maybe residency won't crush your human spirit so much where you're not even interested in other people anymore." -"And to me the best residents are those that actually are interested in

		your life. It's not like they need to be your best friend, but they care, and they're people."
	Offering Reassurance (8)	-"I've had residents ask me a question that seemed basic and me not know the answer, and they'll be, "'It's okay. I didn't know the answer last year either, but it's important for this clerkship, and this principle underlies everything else we're doing, that x…'" and you don't feel like an idiot, it helps." -"…. it's like moral support but it also gives you more confidence to do it next time without being so wishy-washy about it." -"But it's the residents who make you feel like you're doing something, and that you have potential, and that it's okay where you're at, and you're going to improve and learn, and we've all been there. And it sort of makes you trust the system." -"A lot of the time people are just, "'Oh, I was so much better than this…better at this at your level'"…especially attendings have said that a bunch of times. But the residents say, "'Oh, no. I was worse. We all started from nowhere. Everyone had their first day on rotation.'"
	Creating a Sense of Team (6)	-"Another element for a good resident, and that's creating a sense

		of a team." -"They'd have these really sick patients and they'd figure out who needed to do what early in the day. It was really cool to come back together at some point and all of us would say what we did and the whole thing would come together." -"I think part of being in the team for me was when the resident would tell me about all the patients that we were in charge of, instead of just my patient."
	Being Open to Questions (5)	-"Because I think it's not just them telling you about things, but it's also them prompting you to think by being open to questions." -"Another great quality for me is approachability." -"You're more comfortable going to residents with questions because you know they weren't too far from your shoes and they can like understand some of what you would consider stupid questions."
	Using Humor (1)	-"Those that used humor."
Providing Experiential Learning Opportunities (26) Offers opportunities for		

meaningful, active participation and supervised practice		
	Providing Experiential Learning Opportunities-Generally (12)	- [The resident would say] “’Have you ever put a Foley in?’” “’Yes,’” and they’d say, “’Okay, well let’s do it together,’” or, “’Have you ever done a running subcuticular stitch?’” And you say, “’Yes,’” and so they’d say, “’Okay well let’s do it together’”.” -“I learned a lot more from being allowed to do something, by working it out by myself rather than just being told how it happens. Residents let me try and that learning really stuck.” -“How to do literature searches and how to find information that you don’t have then and there when you need it. You know, you have sessions in the library in first and second year but until you’re actually there looking at the problem, and you’re not sitting with someone that’s next to you on a computer, you don’t really get the sense of it.”
	Giving Opportunities for Ownership of Patients (7)	-“When they give you more responsibility and ownership of a patient I think it’s great.” -“Giving opportunities for participation and giving opportunities to take ownership for patients, for learning.”

		-“Giving you ownership of that patient…giving you the responsibility…you feel the motivation to think about, what do I want for this patient? Maybe I don’t know exactly what he needs, but what would I want?”
	Involving Student in the Team (7)	-“I think the best resident teachers think about how to involve a student in the team.” -“I also think that the best teaching residents give a medical student a defined role and defined responsibilities in what they should do as part of a team.” -“I think learning can occur much more naturally when the student is made to feel welcome and a part of the team.”
Giving Feedback (23) Provides specific positive and constructive feedback		
	Giving Feedback (23)	-“They are able to pinpoint things that may have been completely outside of your radar but when they point that out to you, you start to think about things differently and your approach to the problem becomes different and your way of presenting becomes different.”

		-“I think a good resident provides feedback on your performance…because I think feedback is absolutely crucial at our point.” -“Residents who took the time to think about my work and performance and give me specific feedback on what I am doing well and what I could improve on.” -“The best residents I’ve had convey, “’You did this well. You’ve got to work on this,’” and nobody’s feelings get hurt. It’s data. It’s feedback the way it should be.”
Setting Expectations (12) Sets and clarifies roles, responsibilities and standards of performance		
	Setting Expectations for Student Performance (8)	-[One resident said] “’I want you to arrive about this much time ahead of me and by the time I see you in the morning, I want you to have found out this about someone’”.” -“I also knew what was expected of me.” -“I liked it when they…..expected a great deal from me, just as I do from them, because it inspired me

		to perform."
	Explaining Student Role Explicitly (4)	-"I also think that the best teaching residents give a medical student a defined role." -"Somebody who…describes to you your role." -"They know that if we learn how things work and what our role is then their life is easier. It helps us and it helps them."
Stimulating Learning (11) Encourages learners to be self-directed and take control of their learning		
	Challenging Students to Learn (8)	-"I had a couple of interns in medicine who would ask me what I wanted to order every day for the patients that I was following. That was, I thought, really good because it challenged me to think not only about what's going on with the patient but what the next steps are and should be and what I needed to learn about." -"I had one resident who got me to see a patient and do a whole history and physical and plan, and then also propose the medications, routes and the IV fluid doses. It felt a bit

		beyond my level. But then I'd try to do it and research it and carry it as far as he asked me to." -"The residents really pushed me. Before one family meeting, my resident asked me what my questions would be and what I'd say in the meeting. I told him what I thought and he pushed me for more. I only knew what I'd learned in a lecture about that topic."
	Directing Students to Seminal Literature (3)	-"Giving me a head up about what else I might want to review and learn when I had a certain presentation." -"My residents pointed me toward a lot of seminal literature, which I guess I wasn't fully aware of before I got there…they'd say, "'these are what you should know'"."

Appendix 2: Knowledge and Skills Learned from Residents

Domain (Number of Comments)	Theme (Number of Comments)	Representative Comments
Patient Care (52)		
	Linking Knowledge to Clinical Care (16)	-“Medical knowledge that is useful and related to clinical cases.” -“Linking things to patient care….to have a patient in front of you and then teach based on that patient.” -“They realize that there are steps missing in between the things we read about and that we don’t know how to actually do things, so they help you take those intermediary steps. It’s like connecting the dots for us between what we learned in first and second year and the actual patient.” -“They taught me how to explain findings and link my formal knowledge of pathophysiology to the clinical case.”
	Clinical Reasoning (9)	-“What things should you check for this patient based on what the differential is and what tests you should order first.” -“Starting big but then really taking the information and really being rational about why you do certain tests and why you go down certain paths with the information you’re given.”

		-“How they were thinking through a case…you really get to hear them reasoning through stuff. I learned tons from that and no book could teach me that.”
	Managing Patients (8)	-“What steps are needed for [patient] management on a daily basis.” -“Actually how to take care of patients.” -“Wow to manage patients that you are following.”
	Physical Examination Skills (7)	-“I think physical exam findings are huge.” -“’You said they had crackles, well you said they have this type of crackles but they’re also rhonchorous too.’ And this is the difference between that or [they] give you something to compare it to.” -“There was one resident who…would pick a different part of the physical exam and with all the medical students on the team, go to that patient’s bedside and do the physical exam.” -“I want to say there is a systolic murmur but I also might be crazy…so she like listened and she said, ‘Yes that’s definitely it,’ and she listened again and [said] its probably classified as this, this, and this.”
	Prioritizing (7)	-“’You know that doesn’t make sense, here’s why and let’s wait on that,’ and

		you learn how to prioritize." -"Prioritizing and becoming efficient I would say." -"I feel like the residents really have taught me what matters, sort of, in medicine, day to day…'What's the priority right now, in the moment? What's the most pressing, urgent issue?'…whether it's attending rounds or whether it's going and asking the patient what insurance they have…how to sort of prioritize day-to-day, minute-to-minute decisions."
	Logistics of Doing Procedures (3)	-"I knew about the ankle-brachial index and I said, 'All right, this is what I would do.' And they were, 'Okay, how do you actually do that and what are the steps?'" -"You learn more hands-on things…we learned, oh, we need an ABG because this person's desatting. Before, that process of, oh, we need an ABG would kind of just be in a question you would fill out the answer to…not ever learn the logistics…not to get the materials, assemble it."
	History-Taking Skills (1)	-"Interviewing skills, ways to ask specific questions."
	Reassurance and Empathy Toward Patients (1)	-"Empathy in the sense that they're good with like patients."

Communication (42)		
	Interacting with Others (22)	-“I didn’t realize as an early medical student how much of a doctor’s job is just communicating, speaking to other doctors, speaking to patients. It’s all about oral communication.” -“Learning how to interact with other professionals, including nurses.” -“I learned a lot of ways to interact with other people on this service…like staff, other teams, family members… physicians, all the people on the team…and other residents.” -“You never really know your place as a medical student what you’re allowed to say to the patient and when the family members ask you in the hallway and you have information, you never really know what you’re allowed to say. I always depended on…probably the interns, actually…to know what was socially appropriate.” -“How the residents interact with one another, both at their own level but also at higher levels, and then how they interact with members of different teams who are all coming together to provide care for the same patient. Those dynamics are complex, and incredibly important in delivering patient care, and you have to learn how to navigate those dynamics.”

	Presenting Cases (9)	-“What’s important versus what’s not important in presentations.” -“Learning how to do a presentation.” -“How to present.” -“Residents helped me increase the efficiency of my verbal presentations and how to really narrow down what’s clinically relevant to a presentation.”
	Calling for Consults (5)	-“Trying to work with consult teams….just how to frame the patient.” -“How do you call a consult?” -“Calling consults, especially. There’s always a certain skill in getting a good response on a consult, and I think residents have been great about teaching us how to do that.”
	Writing Patient Notes (4)	-“I think the one thing I’ve learned from residents is how to write notes.” -“I think I’ve learned a lot of practical things, in terms of …not knowing how to write notes. Residents were really good about taking the time, teaching you those things.” -“They helped me a lot with my notes”
	Giving Sign-Out (2)	-“Sign-out…is really a great lesson I’ve learned.”

Navigating the System (30)		
	Getting Things Done on the Floor (14)	-“You take the patient into the OR and you have to be with them the whole time and then…you walk them to the recovery room…you are the person that’s doing all this stuff, and you put the Foley in and you put their compression boots on.” -“Just how to get stuff done on the floor. I had never been on a floor. I didn’t really know.” -“I think I’ve learned a lot of practical things, in terms of not knowing my way around, not knowing how to do things.”
	How the System Works in the Hospital (7)	-“I’d like to add that my residents showed me how to efficiently move through the system [in the hospital].” -“I think helping us get acclimated to working in the hospital has been the most important thing for me…just how things run.” -“They taught me how the system at each hospital really worked.”
	What is the Hierarchy (5)	-“Orientation of the team structure.” -“We learned about the hierarchy of the team.” -“I’d look to the residents just to understand that hierarchy and rules.”
	Who To Go To For Things (4)	-“Who to involve to put together that story so that you could answer the

		question in the end." -"Who to ask a certain question of." -"Who to ask questions of…who is going to be helpful if you go and talk to them on the floor."
Adaptability (22)		
	Balancing Work and Life (7)	-"You see…how they balance their lives during residency and you see that they still sometimes go out and have fun and things like that." -"How to manage your time and balance work with your own personal life." -"In the end, you need to weigh the responsibilities of your profession with the things that keep you in balance and that maintain your sanity. Because you could very easily spend all your time trying to impress your supervisors, your chiefs, your attendings, and then you would leave no time for yourself." -"One of the things that it seems that residents try to instill in you is how to participate in those life- and family-sustaining things."
	Responding to Stress (6)	-"How they deal with stressful situations." -"So seeing that they stress out when they're in the OR and they break a knot or if they don't know a question. Then seeing them afterwards and how they brush it off and know that there's

		more work to do and it's not the end of the world. That was very therapeutic to know that I'm not going…there's no way you can impress everyone all the time. So, seeing them stressed out and how they responded was actually good for me." -"They'd have so much to do and they'd stop to laugh and kid around. I thought that was amazing because otherwise the stress would get to you for sure. I totally appreciated that this is a skill they don't teach you in medical school."
	Responding to Criticism and Feedback (4)	-"Times when they did something that was positive and that was interpreted not that way by the chief or by an attending, and seeing them sweat and still come out ok. I felt for them, and learned a lot from that." -"I've seen a bunch of times, especially on surgery, residents get completely chewed out by attendings. And then the attending leaves, and the residents are like, "Oh, it's okay. It's just because he loves me." Or like, "It's because it's going to better my career, or because they actually care." I learned how to graciously accept that criticism…not to take it personally." -"So the way they respond to feedback can actually serve as a model for how you might be able to take it, or respond to it. That helped

		me.”
	Thinking and Responding Quickly (3)	-“How to think fast and in the moment.” -“How to think on your feet.”
	Developing and Modifying Routine (2)	-“How they do things routinely and how they have to modify their routine.” -“They showed me how to adapt to different situations.”
Functioning as a Student/Resident (19)		
	Roles and Expectations of Students (9)	-“Residents explained to me what my role should be.” -“Learning my role as a medical student.” -“[The resident would say] ‘This is what the attending expects you to do. So, this is what you’re doing now’.” -“What do they expect with their presentations? What do they expect when the patient comes in the room? Are you supposed to wait or are you not?”
	How to Function as a Resident (8)	-“The stuff that we’re going to need to know come intern year.” -“How to function as a resident, because that’s what you’re going to be doing.” -“They also gave me advice that taught me how to function like a

		resident, even though I'm still only a student."
	Transitioning from Preclinical to Clinical Environment (2)	-"I've also learned about transitioning from pre-clinical to clinical. I think that's one of the skills that the residents remember better than anyone else, and so they're able to speak in the manner of, you know, 'When I did this transition…' or, 'When I was on my surgery clerkship this is what I did'." -"You can't start accessing higher level knowledge and higher level analysis. So the interns really help bridge that gap and make it a little bit smaller."
Life-Long Learning (9)		
	Self-Directed Learning (4)	-"I also learned how they learned new stuff. We had a case that looked like something the residents had seen before and we all went about treating it as per usual. But then the patient got sicker, not better, and the intern had to think long and hard about what happened and what to do about it. She curb-sided a bunch of people and kept trying to figure out why this case was different." -"How to be professionally curious." -"How to do literature searches and how to find information that you don't have then and there when you need it."

	Technology to Use at the Point of Care (3)	-“The use of tech. They would teach you how to look things up on your phone, and what apps are good, how to down load them and how to use them.”
	Reading the Seminal Literature (2)	-“My residents pointed me toward a lot of seminal literature.”
General Comments (9)		
	What Not To Do (5)	-“Then there are residents that are…not good with patients. I was like okay I’m not going to be like that. I will be the opposite of that.” -“What not to do.” -“If I see a resident do something I really don’t like, I can say, “I don’t to ever do that. I don’t want to ever talk to a patient that way.””
	What To Do (4)	-“A lot about what to do and how to behave.” -“There were behaviors I learned…that I want to emulate.”
Career/Professional Development (7)		
	Career Development (4)	-“The myths and truths about residency especially in regards to choosing programs.” -“General career guidance…the way I look at it, knowing what your eventual career is like is sort of like a step-wise process where it becomes gradually

		clearer. So the residents have one clearer step than us…like what our lives are actually going to be like when we finish school. So it's good to get perspective from around the bend that you might not otherwise have."
	Culture of Different Fields (3)	-"Learning the actual cultures of different specialties. You hear about stuff like that before you start but you don't really know it until you see it and hear it." -"I heard surgery was so-and-so and ped[iatric]s was filled with kind, understanding people and how so and so specialty thinks this of another specialty."
Medical Content (7)		
	Basic Knowledge (7)	-"Content type teachings." -"General antibiotic review, just major classes and major illnesses." -"Like the little shortcut diagrams for lab values." -"Helping me interpret lab values or basic things like that."

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VITA

REENA KARANI, MD, FACP

ACADEMIC APPOINTMENTS

2009 – present	Associate Professor (Primary Appointment) Department of Medical Education Mount Sinai School of Medicine New York, NY
2009 – present	Associate Professor (Secondary Appointment) Brookdale Department of Geriatrics & Palliative Medicine Mount Sinai School of Medicine New York, NY
2009 – present	Associate Professor (Secondary Appointment) Samuel M. Bronfman Department of Medicine Mount Sinai School of Medicine New York, NY
2003 - 2009	Assistant Professor (Primary Appointment) Brookdale Department of Geriatrics & Palliative Medicine Mount Sinai School of Medicine New York, NY
2003 – 2009	Assistant Professor (Secondary Appointment) Samuel M. Bronfman Department of Medicine Mount Sinai School of Medicine New York, NY
2008 – 2009	Assistant Professor (Secondary Appointment) Department of Medical Education Mount Sinai School of Medicine New York, NY

HOSPITAL APPOINTMENTS

2009 - present	Associate Attending Brookdale Department of Geriatrics and Palliative Medicine Mount Sinai Medical Center

New York, NY

2003 - 2009 — Assistant Attending
Brookdale Department of Geriatrics & Palliative Medicine
Mount Sinai Medical Center
New York, NY

2003 – 2006 — Medical Director, Geriatrics Consultation & Liaison Service
Brookdale Department of Geriatrics & Palliative Medicine
Mount Sinai Medical Center
New York, NY

2006 – 2010 — Clerkship Co-Director, Integrated Internal Medicine-Geriatrics Clerkship
Mount Sinai School of Medicine
New York, NY

2008 – 2010 — Director, Clinical Curriculum and Assessment
Mount Sinai School of Medicine
New York, NY

2010 – present — Associate Dean, Undergraduate Medical Education and Curricular Affairs
Mount Sinai School of Medicine
New York, NY

EDUCATION

1989-1993 — Bachelor of Science with Honors, Biology
Brown University
Providence, RI

1993-1997 — Doctor of Medicine
Albert Einstein College of Medicine
New York, NY

POSTDOCTORAL TRAINING

1997 - 1998 — Intern, Department of Internal Medicine
Montefiore Medical Center of the Albert Einstein College of Medicine
New York, NY

1998 - 2000	Resident, Department of Internal Medicine Montefiore Medical Center of the Albert Einstein College of Medicine New York, NY
1999 -2000	Chief Resident, Department of Internal Medicine Montefiore Medical Center of the Albert Einstein College of Medicine New York, NY
2000 -2001	Fellow, Department of Geriatrics Mount Sinai School of Medicine New York, NY
2001-2002	Chief Fellow, Department of Geriatrics Mount Sinai School of Medicine New York, NY
2002 – 2003	Medical Education Research Fellow, Department of Geriatrics Mount Sinai School of Medicine New York, NY

CERTIFICATION

1998	Diplomat, National Board of Medical Examiners
2001 - 2011	Diplomat, American Board of Internal Medicine
2004 - 2014	Diplomat, American Board of Internal Medicine, Subspecialization in Geriatric Medicine
2011 - 2021	Diplomat, American Board of Hospice and Palliative Medicine

LICENSURE

2003 - present	New York State, License # 228703

HONORS AND AWARDS

Sigma Xi (ΣX) Inductee, National Scientific Honor Society, Brown University, 1993

Alpha Omega Alpha (ΑΩΑ) Inductee, National Medical Honor Society, Albert Einstein College of Medicine, 1997

Research Award, Brookdale Department of Geriatrics and Palliative Medicine, Mount Sinai School of Medicine, 2002

Presidential Award in Medical Education, Annual Meeting of the American Geriatrics Society, 2002

John A. Hartford Foundation Center of Excellence Fellow, Mount Sinai School of Medicine, 2002-2004

Excellence in Teaching Award, Mount Sinai School of Medicine, 2006

Teacher of the Year Award, Brookdale Department of Geriatrics and Palliative Medicine, Mount Sinai School of Medicine, 2007

Invited Coater, Tenth Annual White Coat Ceremony for the Class of 2011, Mount Sinai School of Medicine, 2007

Alpha Omega Alpha (ΑΩΑ) National Medical Honor Society, Class of 2008, Mount Sinai School of Medicine, 2008

Fellow, American College of Physicians, 2010

Master Educator, Mount Sinai School of Medicine, Institute for Medical Education, 2010

Edward J. Ronan Award, Mount Sinai School of Medicine, 2012

OTHER PROFESSIONAL APPOINTMENTS

2002	Reviewer, Mid-Atlantic Research Abstract Committee, Society of General Internal Medicine.
2003 – 2004	Associate Editor, Portal of Online Geriatric Education (POGOe).
2003 – present	Reviewer, Journal of the American Geriatrics Society.

2004	Reviewer, Geriatric Medicine, the 27th Annual Meeting of the Society of General Internal Medicine.
2004	Reviewer, Medical Education Workshop Committee, the 28th Annual Meeting of the Society of General Internal Medicine.
2004 – present	Reviewer, Journal of General Internal Medicine.
2004 – present	Reviewer, Teaching and Learning in Medicine.
2005 – 2009	Member, Society of General Internal Medicine working group for the Merck Institute of Aging and Health grant application to improve the care of older adults by practicing physicians
2005 - present	Member, Institute for Medical Education's Annual Medical Education Research Day Selection Committee, Mount Sinai School of Medicine, New York, NY.
2005 – present	Reviewer, Innovations in Medical Education for the Annual Meetings of the Society of General Internal Medicine
2006 – present	Reviewer, Medical Education Abstracts for the Annual Meetings of the American Geriatrics Society.
2007	Member, Editorial Board, MKSAP for Students 4, American College of Physicians.
2008	Invited Judge, Distinguished Professor of Geriatrics Oral Abstracts and Poster Sessions, 31st Annual Meeting of the Society of General Internal Medicine
2011 - present	Member, NBME USMLE Step 2CS test writing committee
2011 – present	Co-Chair, Society of General Internal Medicine Education Committee

ADMINISTRATIVE LEADERSHIP APPOINTMENTS

Internal: Clinical

Appointments and Role	Years	Time Commitment	Purpose and Accomplishments
Medical Director, Geriatrics Consultation and Liaison Service	2003 - 2006	10 hours/week	Develop and coordinate all aspects of this service for faculty, interdisciplinary staff, geriatric medicine fellows, internal medicine residents and medical students.
Member, Clinical Council, Brookdale Department of Geriatrics and Palliative Medicine	2003 - 2006	Weekly meetings	Manage and develop the clinical services of the department across inpatient and outpatient venues.
Member, Executive Committee, Brookdale Department of Geriatrics and Palliative Medicine	2004 - 2006	Monthly meetings	Report on and with work with departmental leadership on all aspects of clinical care related to geriatric patients.

Internal: Teaching

Appointments and Role	Years	Time Commitment	Purpose and Accomplishments
Member, Education Committee, Brookdale Department of Geriatrics and Palliative Medicine	2000-present	Monthly meetings	Review and develop educational curricula and medical education research for the department and its training programs.

Member, Evidence-Based Medicine Committee, Brookdale Department of Geriatrics and Palliative Medicine	2000-2004	Monthly meetings	Review the literature and develop critical appraisals of studies for publication and presentation.
Member, Consortium Committee on Graduate Medical Education, Mount Sinai Medical Center	2001-2002	Monthly meetings	Review all aspects of graduate medical education at the medical center and its affiliates and participate in mock internal residency reviews.
Course Director, Primary Care Update Series, Office of Continuing Medical Education (CME)	2003	Weekly meetings, Summer and Fall 2003	Design, develop and review a 3-part CME series in primary care medicine.
Member, Fellow Ambulatory Care Education (FACE) Initiative, Brookdale Department of Geriatrics and Palliative Medicine	2004-2005	Monthly meetings	Design, implement and evaluate an ambulatory care curriculum in geriatric medicine for fellowship trainees.
Member, Longitudinal Evaluation and Assessment Program (LEAP), Brookdale Department of Geriatrics and Palliative Medicine	2004-2007	Bi-monthly meetings	Design, implement and evaluate a longitudinal competency-based evaluation in geriatric medicine for fellowship trainees and interdisciplinary learners.
Course Co-Director, Donald W. Reynolds Train-the-Trainer Grant Geriatric Medical	2004-present	Bi-weekly meetings	Design and implement a yearlong geriatric medical education certificate program for physicians of

Education Certificate Program Committee			different specialties.
Member, Curriculum Content Review Taskforce Subcommittee, Mount Sinai School of Medicine	3/2006 – 6/2006	Bi-weekly meetings	Participated in a systematic curriculum and evaluation review of 2nd year Brain and Behavior course. Drafted a comprehensive program evaluation document for presentation to course directors and the Executive Curriculum Committee
Member, Institute for Medical Education (IME) Membership Advisory Committee, Mount Sinai School of Medicine, New York, NY	2006 - 2008	Bi-monthly meetings	Developed blueprint of categories of IME membership and selection guidelines based on the Institute's mission.
Course Co-Director, Donald W. Reynolds Mini-fellowship in Geriatric Medicine, Mount Sinai Medical Center, New York, NY.	2006 - 2010	Monthly meetings plus 3 day course	Designed, implemented, managed and reviewed an annual 3-day program in geriatric medicine and curriculum design and evaluation for non-geriatricians.
Chair, Clinical Curriculum Committee, Mount Sinai School of Medicine	2006 – 2008 (Member) 2008-2011 (Chair) 2011-present (Member)	Monthly meetings	Review and monitor all clinical clerkships, supervise completion of LCME requirements for clinical clerkships, and develop cross- clerkship content.

Co-Director, Integrated Internal Medicine-Geriatrics Clerkship	2006 - 2010	50% time	Co-directed mandatory, integrated three-month clerkship for third year medical students, provided career guidance to students, designed and implemented learner and program evaluation strategies, provided ongoing faculty development and support, and fulfilled requirements and documentation as required by the LCME.
Member, Core Competency Committee, Mount Sinai School of Medicine, New York, NY	2007 - 2009	Biweekly meetings	Developed competency blueprint for upcoming medical school curriculum change, oversaw subcommittees developing second level competencies.
Member, Education Leadership Committee, Brookdale Department of Geriatrics and Palliative Medicine	2007 – present	Monthly meetings	Coordinate and review all educational efforts within the department for faculty, interdisciplinary staff, fellows, residents and students.
Member, Executive Curriculum Committee, Mount Sinai School of Medicine, New York, NY	2008 – present	Monthly meetings	As mandated by the Medical Board, discuss, review and approve all medical school courses, evaluate new curricular proposals and oversee course content review process

Member, Promotions Committee, Mount Sinai School of Medicine, New York, NY	2008 – present	Monthly meetings	Review and deliberate, make determinations, offer guidance and vote on all cases brought to the committee.
Director, Clinical Curriculum and Assessment, Mount Sinai School of Medicine, New York, NY	2008 – 2010	30% time	Direct and oversee the clinical curriculum and learner and program evaluation across all four years of medical school, oversee LCME mandates and documentation of clinical training, provide faculty development and support to course and clerkship directors, monitor student training across affiliate sites and chair the clinical curriculum committee.
Member, Electives Taskforce, Mount Sinai School of Medicine	2009	Monthly meetings, Summer and Fall	Reviewed, deliberated and developed the blueprint for elective courses and credits to be completed by MSSM students prior to graduation
Director, COMPASS 2 (Comprehensive Assessment Examination), Mount Sinai School of Medicine, New York, NY	2009 – 2011	Monthly meetings Fall and Winter, plus Spring remediation meetings	Oversee development, implementation and evaluation of the end-of-third-year comprehensive clinical assessment exercise using standardized patients. Supervise faculty to design cases, develop measurement instruments, and provide feedback and

			remediation to students.
Design Team, Intersession, Mount Sinai School of Medicine, New York, NY	2009 – 2010 (course director) 2010 – 2011 (team member) 2012-present (course co-director)	Weekly meetings- Winter and Spring, plus 4 day course	Lead a design team of faculty to develop the curriculum and evaluation matrix for Intersession, a 4 day course for third year medical students focused on career counseling, fourth year planning and residency preparation. Oversee course implementation and evaluation, support and supervise faculty and staff during the course and fulfill requirements and documentation as required by the medical school.
Design Team, Clinical Skills Week, Mount Sinai School of Medicine, New York, NY	2009 – 2010 (course director) 2010 – 2011 (team member) 2012-present (course co-director)	Weekly meetings-Spring, plus 4 day course	Lead a design team of faculty to develop the curriculum and evaluation matrix for Clinical Skills Week, a 4 day course for rising third year medical students focused skill development, professionalism, clinical training and career development. Oversee course implementation and evaluation, support and supervise faculty and staff during the course and fulfill requirements and documentation as required by the medical school.
Member, Institute for	2009 –	Biannual	Review, present, deliberate

Medical Education (IME) Membership Selection Committee, Mount Sinai School of Medicine, New York, NY	present	meetings	and vote on applications for IME Fellow and Master membership.
Chair, Medical Education Dean's Office Structuring Committee, Mount Sinai School of Medicine, New York, NY	2010	2 day Winter retreat	Review current organizational structure of Med Ed Dean's office at MSSM, review national models, develop additional models to meet the needs of the new curriculum at MSSM and prepare presentation for the Dean
Associate Dean of Undergraduate Medical Education and Curricular Affairs, Mount Sinai School of Medicine, New York, NY	2010 – present	80% time	Oversee the four year medical school curriculum as well as the evaluation and assessment programs; create communication mechanisms, evaluation procedures and accountability structures to ensure educational excellence; support faculty educators responsible for medical student education; oversee the school curriculum leadership team including faculty and staff; promote educational innovation and research and serve as a member of the Department of Medical Education leadership team. Along with the Associate Dean for UME and Student Affairs, oversee the

			learning resources program, the wellness program, the career development program and the educational technology program.
Chair, Curriculum Design Team, Mount Sinai School of Medicine, New York,NY	2012-present	Biweekly meetings	Oversee a committee of faculty, medical education leaders, students and staff to renew and reform the undergraduate medical education curriculum

Internal: General Administration

Appointments and Role	Years	Time Commitment	Purpose and/or Accomplishments
Member, Geriatric Medicine Ambulatory Retreat Committee, Brookdale Department of Geriatrics and Palliative Medicine	2004	Weekly meetings, Spring 2004	Developed components of the ambulatory geriatric medicine retreat.
Member, Mount Sinai Pressure Ulcer Committee	2005 - 2006	Monthly meetings	Participated in interdisciplinary group meetings to oversee hospital pressure ulcer prevention and management policies.
Member, Achieving Clinical Excellence in Medicine (ACEM) Hospital Committee	2005 – 2010	Monthly meetings	Reviewed data and provided oversight for patient safety and quality measures as these relate to adults hospitalized at Mount Sinai Medical Center.

	2005 - 2010	Quarterly meetings	Served as co-leader of the training grant subcommittee.

External

Appointments and Role	Years	Time Commitment	Purpose and Accomplishments
Member, Education Committee of The American Geriatrics Society (AGS)	2004-2007 2007-2010 2010-2013 (reelected)	Bi-annual meetings	The mission of the committee is to promote geriatrics education for all trainees and health professionals. -Participate in Annual Meeting Mentoring Sessions -Complete ABIM question linkages project -Participate in lobbying efforts to renew Title VII funding for geriatrics -Spearhead proposal for Medical Education Oral Research Session, lead the proposal through the Research and Program Committees and Chaired the session since 2006
Faculty, Educators in the Health Professions, Harvard Macy Institute of Harvard University, Cambridge, MA	2004–2011	15 days per year, 65 participants	-Lead journal club, microteaching, assessment, curriculum and project groups -Provide one-on-one consultations to participants

			in the area of learner and program evaluation
Co-Chair and Member, Education Committee of The Society of General Internal Medicine (SGIM)	2005 – present 2011 – present (Co-Chair)	Monthly meetings	The missions of this committee are to address the needs of medical educators, develop strategies for improving the level of teaching competencies and evaluate and reward teaching excellence and scholarship. -Participate in Annual Meeting Mentoring Sessions -Review and comment on position papers sent to the committee for review -Co-lead development of the Annual Update in Medical Education
Member, Steering Committee for "Educators in the Health Professions," Harvard University, Cambridge, MA	2005 - present	Quarterly meetings	The goal of the program is to improve the knowledge base and skills of health care professionals in curriculum and program development, leadership and evaluation. -Review feedback and design annual course, instructional methods and evaluation tools
Chair and Member, Scholarship in Medical Education Award Committee, The Society	2005 – 2006 2007-	Bi-weekly meetings, Spring 2006, 2007, 2008, 2009	-Select faculty to serve as reviewers and solicited nominees

of General Internal Medicine (SGIM)	2008 2008 - 2009 (member) 2006 - 2007 (chair)		-Lead bi-weekly review meetings to select candidates for three awards -Present awards at the Annual Meeting
Member, Program Committee for the 2007 Annual Meeting of The Society of General Internal Medicine (SGIM)	2006 - 2007	Monthly meetings	-Select plenary speakers and designed workshops, updates and presentations around annual meeting theme (Quality Initiatives).
Co-Chair, Innovations in Medical Education, 2007 Annual Meeting of The Society of General Internal Medicine (SGIM)	2006 - 2007	Monthly meetings	-Select reviewers and coordinate complete review process for abstract selection -Facilitate oral abstract sessions at the SGIM Annual Meeting -Award best medical education oral abstract at the Annual Meeting
Chair, Geriatrics Medical Education Abstract Committee, Annual Meeting of The American Geriatrics Society (AGS)	2006 - 2007 2007 - 2008 2008 - 2009	Bi-monthly meetings during review period	-Select reviewers and coordinate complete review process for abstract selection -Present top abstracts to program committee

	2009 - 2010 2010 - 2011 2011-2012		-Chair oral research session at the AGS Annual Meeting -Review and score all medical education posters at the Presidential Poster Session. Select best medical education poster -Award best medical education oral abstract at the AGS Annual Meeting
Faculty, Comprehensive Assessment in Health Sciences Education, Harvard Macy Institute of Harvard University, Cambridge, MA	2006 - 2007	5 days per year, 50 participants	-Lead journal club, student and faculty assessment sections and project group -Provided one-on-one consultations to participants in the area of student, faculty and program evaluation
Chair, Workshops, 2010 Annual Meeting of The Society of General Internal Medicine (SGIM)	2009 - 2010	Monthly meetings	-Select reviewers and coordinate complete review process for workshop selection -Serve on Program Committee to develop and plan 2010 Annual Meeting and all evaluation instruments
Grant Reviewer, Geriatric Academic Career Awards, Bureau of Health Professions Education	2010	2 days	-Serve as reviewer of career development award applications submitted to HRSA -Present and vote on applications

TRAINING RECORD

Name	Level of Trainee	Role and Dates	Training Venue	Current Status	Other Information
Damien Szyld	Medical Student	Career Advisor 2002 - 2005	Medical school	Medical Simulation Fellow, Harvard University, Boston, MA	Hartford Foundation/AFAR Medical Student Summer Research Program in Geriatrics grantee
Sandra Sanchez-Reilly	Fellow and Chief Fellow in Geriatrics	Career Advisor/ Career Award Collaboration Mentor 2003 - 2006	Department of Geriatrics	Associate Professor of Geriatrics and Palliative Care, University of Texas Health Sciences Center, San Antonio, TX	Brookdale Department of Geriatrics Research Award. K01 Geriatric Academic Career Award Recipient (2005-2007)
Mauli Desai	Medical student	Career Advisor 2003 - 2005	Medical school	Resident (Internal Medicine), Columbia University College of Physicians and	Faculty advisor for Narratives in Medicine project

				Surgeons, NY	
Richard Morgan Bain	Fellow in Geriatrics	Career Advisor 2004 - 2007	Department of Geriatrics and Palliative Medicine	Assistant Professor, Wake Forest University, NC	Hospice Medical Director (2007-present) K01 Geriatric Academic Career Award Recipient (2007-2010)
Anca Dinescu	Fellow in Geriatrics	Research Co-Mentor 2005 - 2008	Department of Geriatrics and Palliative Medicine	Medical Director, Washington DC Veterans Affairs Medical Center.	Faculty co-mentor for fellow's research project Blue Ribbon Winner and AAMC Annual Meeting Fellowship, Institute for Medical Education's Annual Education Research Day, Mount Sinai School of Medicine (2007)

Sandy Liang	Medical student	Career Mentor 2005 - 2008	Medical school	Resident (Internal Medicine), University of Hawaii, Honolulu, HI	Hartford Foundation/AFAR Medical Student Summer Research Program in Geriatrics grantee
Nisha Rughwani	Fellow in Geriatrics	Research Mentor, Career Mentor 2005 - present	Department of Geriatrics and Palliative Medicine	Assistant Professor and Medical Director, Concurrent Service, Mount Sinai School of Medicine, NY, NY.	Blue Ribbon Winner, Institute for Medical Education's Annual Education Research Day, Mount Sinai School of Medicine (2007) Best medical education research submission, Annual Meeting of the American Geriatrics Society (2008) K01 Geriatric Academic

					Career Award (2010-2015)
Sara Bradley	Fellow in Geriatrics	Research Co-Mentor, Career Mentor 2005 - present	Department of Geriatrics and Palliative Medicine	Assistant Professor, Co-Director, Integrated Internal Medicine-Geriatrics Clerkship	Faculty co-mentor for fellow's research project Advancing Clinical Excellence in Medicine Award recipient (2006) Metropolitan American Geriatrics Society Award for Research (2007) K01 Geriatric Academic Career Award (2007- 2010)
Rachel Stark	Fellow in General Internal Medicine	Research Co-Mentor Career Mentor 2005 -	Department of Medicine	Associate Program Director, Primary Care Internal Medicine	

		present		Residency, Cambridge Health Alliance, Cambridge, MA.	
Jane Jue	Resident in Internal Medicine	Research Mentor 2006 - 2007	Department of Medicine	Robert Wood Johnson Clinical Scholar, Yale University, New Haven, CT.	Faculty mentor for resident's research project
Jessica Stern	Premedical student Medical student	Career mentor 2004 – present	Alzheimer's Disease Research Center, Mount Sinai Medical Center Medical school, Rochester University School of Medicine	Resident (Internal Medicine-Pediatrics), Rochester University School of Medicine, NY	
Pooja Mehta	Medical student	Career mentor 2007 - 2009	Medical school	Resident (Ob-Gyn) Boston University Medical Center, Boston, MA	
Sara	Medical	Career	Medical	Resident	

Schwanke-Khilji	Student	mentor 2007 - 2009	school	(Internal Medicine) Massachusetts General Hospital, Harvard University, Boston, MA	
Lauren Peccoralo	Resident in Internal Medicine	Research Co-mentor 2007 - 2010	Department of Medicine	Assistant Professor, Mount Sinai Medical Center, New York, NY	Faculty co-mentor for research project
Alison Rapoport	Medical student	Research Co-mentor Career mentor 2007 – 2008 2009 - 2010	Medical school	Resident (Internal Medicine) Cambridge Health Alliance of Harvard University, Boston, MA	Faculty co-mentor for research project Medical Student Training in Aging Research (MSTAR) grant recipient (2007)
Gabrielle Goldberg	Faculty in Palliative Medicine	Research Co-mentor 2009 - 2011	Department of Geriatrics and Palliative Medicine	Director of Education, Hertzberg Palliative Care Institute, Mount Sinai School of	Blue Ribbon Winner, Institute for Medical Education's Annual Education

				Medicine, NY, NY.	Research Day, Mount Sinai School of Medicine (2010)
Rachael Bedard	Medical student	Research Co-mentor 2009 – 2010	Medical School	Resident (Internal Medicine) Cambridge Health Alliance of Harvard University, Boston, MA	Faculty co-mentor for research project
Nora Segar	Medical student	Research Co-mentor 2010 – present	Medical School	Resident (Internal Medicine-Primary Care), Yale University, New Haven, CT.	Faculty co-mentor for research project INSPIRE Fourth Year Research Program Recipient
Lauren Stossel	Medical students	Research Co-mentor 2010 – present	Medical School	Medical student, Mount Sinai School of Medicine, NY, NY.	Faculty co-mentor for research project Blue Ribbon Winner, Institute for Medical

					Education's Annual Education Research Day, Mount Sinai School of Medicine (2011) Distinction in Medical Education (2012) Distinction in Research (2012)
Milana Zaurova	Medical student	Research Co-mentor 2010 – present	Medical School	Medical student, Mount Sinai School of Medicine, NY, NY.	Faculty co-mentor for research project Patricia S. Levinson Summer Research Award
Rebecca Mazurkiewicz	Fellow in General Internal Medicine	Research Co-mentor 2010-present	Department of Medicine	Fellow (General Internal Medicine), Mount Sinai Medical	Faculty co-mentor for research project

				Center, New York, NY	
Yan Epelboym	Medical student	Research mentor 2011-present	Medical school	Medical student, Mount Sinai School of Medicine, NY, NY.	Faculty mentor for research project
Jonathan Giftos	Medical Student	Research Co-mentor 2011-present	Medical school	Medical student, Mount Sinai School of Medicine, NY, NY	Faculty co-mentor for research project
Samantha Gelfand	Medical Student	Research Co-mentor 2012-present	Medical school	Medical student, Mount Sinai School of Medicine, NY, NY	Faculty co-mentor for research project

TEACHING ACTIVITIES

Teaching Activity	**Level**	**Role**	**Learners: # / session**	**# of Hrs / ssn, # of ssns / yr**	**Years taught**
Art and Science of Medicine I	Medical school course	Preceptor and small group leader	1st yr. Medical Students: 8/ssn	4 - 6 Hrs/ssn, 34 ssns/yr	2000-2001
Art and Science of Medicine II	Medical school course	Preceptor and small group leader	2nd yr. Medical Students:	3 Hrs/ssn, 34 ssns/yr	2001-2003 2011-

			12/ssn		present
Internal Medicine Resident's Objective Structured Clinical Examination (OSCE)	Departmental course	Direct the OSCE, evaluate residents and provide feedback	Internal Medicine Residents: 5/ssn	3 Hrs/ssn, 13 ssns/yr	2001-2003
Palliative Care Intersession	Medical school course	Small group leader	3rd yr. Medical Students: 12/ssn	2 Hrs/ssn, 1 ssn/yr	2002 – 2005
End-of-Life and Palliative Care Curriculum (EPEC)	Continuing Professional Development course	Lecturer, small group leader	Interdisciplinary learners: 30/ssn	2 Hrs/ssn, 2 ssns/yr	2002 - 2010
Outpatient Coffey Geriatrics Practice Preceptor	Departmental course	Teacher/Attending	Medical Students, Geriatric Medicine Fellows and Nurse Practitioners: 4 to 5/ssn	4 Hrs/ssn, 40 ssns/yr	2003 - present
Outpatient Medical Student Preceptor	Medical school clerkship	Small group leader	3rd year Medical Students: 6/ssn	1.5 Hrs/ssn, 8 ssns/yr	2003 – 2011

Inpatient Medical Student Preceptor	Medical school clerkship	Small group leader	3rd year Medical Students: 4/ssn	1.5 Hrs/ssn 8 ssns/yr	2003 – 2011
Consult Service Teaching	Departmental offering	Teacher/Attending	Geriatric Medicine Fellows and Internal Medicine Residents: 2 to 4/ssn	4-5 Hrs/ssn 40 ssns/yr	2003 - 2010
Geriatric Medicine Fellow's Objective Structured Clinical Examination (OSCE)	Departmental course	Direct the OSCE, evaluate fellows and provide feedback	Geriatric Medicine Fellows: 7 to 8/ssn	5 Hrs/ssn 2 ssns/yr	2003-present
Fellow Ambulatory Care Education (FACE) Curriculum	Department course	Lecturer, small group leader	Geriatric Medicine Fellows: 3-4/ssn	1 Hr/ssn 6 ssns/yr	2004 - 2006
Feedback: A Skill-Based Workshop	Departmental course	Lecturer, small group leader	Faculty and Geriatric Medicine Fellows: 15-20/ssn	4 Hrs/ssn 2 ssns/yr	2004 - 2011
Art and Science of Medicine II	Medical school course	Preceptor and small group leader	2nd yr. Medical Students: 12/ssn	4 Hrs/ssn, 34 ssns/yr	2005 - 2008

Master Geriatrics Educator Program (MGEP) of the Donald W. Reynolds Train-the-Trainer Program	Department level	Co-director	Geriatric Medicine Fellows, General Internal Medicine Fellows, Faculty: 15/ssn	3-4 Hrs/ssn 12 ssns/yr	2005 - present
Mount Sinai School of Medicine Intersession: Professional Development and Self Awareness	Medical school course	Small group leader	3rd year Medical Students: 12/ssn	2 hrs/ssn 1 ssn/yr	2006
Integrated Internal Medicine-Geriatrics Clerkship	Medical school clerkship	Co-director	3rd year Medical Students: 140	50% time	2006 - 2010
Mini Fellowship in Geriatrics of the Donald W. Reynolds Train-the-Trainer Program	Continuing Professional Development course	Co-director	Non-geriatrician Faculty: 50	3 days/yr 9 ssns/day	2006 - 2011
Ambulatory Care Clerkship	Medical school clerkship	Consultant and Advisor (curriculum redesign, assessment, clinical site selection,	3rd year Medical Students: 126	4 hrs/week 20 weeks	2008

		logistics)			
Longitudinal Clinical Experience	Medical school course	Consultant and Advisor (curriculum development, learner and program assessment, logistics)	1st year Medical Students: 144	2 hrs/week	2008 - 2010
Intersession	Medical school course	Design team member, small group leader, large group lecturer	3rd year Medical Students: 140	4 days/year 6 hours/day	2009 - present
Clinical Skills Week	Medical school course	Design team member, small group leader, large group lecturer	2nd year Medical Students: 140	4 days/year 6 hours/day	2009 - present
Anatomy of Aging	Medical school course	Program developer, director and small group leader	1st year Medical Students: 144	2 days/year 3 hours/day	2009 - present
Investigator Education Skills Training Program (INVEST)	Continuing Professional Development Course	Program co-developer, director and teacher	Post graduate PhD's and junior research faculty	8 days/year 3 hours/day	2010 - present

GRANT AND CONTRACT SUPPORT

Funding Source, Project Title and Number	Role in Project, % time	Dates	Direct Costs
Past Support			
Fan Fox and Leslie R. Samuels Geriatric Education and Research Foundation Award An evidence-based unfolding case with an Objective Structured Clinical Examination	Principal Investigator, 30%	10/01/01 – 6/30/02	$5,000
John A. Hartford/American Federation for Aging Geriatrics Award An evidence-based unfolding case with an Objective Structured Clinical Examination	Principal Investigator, 30%	07/01/02 – 06/30/03	$50,000
Health Services & Resources Administration (HRSA)/Bureau of Health Professions (BHP) Geriatric Academic Career Award (GACA) 1 K01 HP 00091-01 Developing and evaluating geriatric medicine curricula for medical & surgical subspecialties	Principal Investigator, 75%	09/30/03 – 09/29/06	$172,200
Attorney General Prescriber and Consumer Education Grant	Investigator, 5%	01/01/07 –	$400,000

Program Data smog and marketing fog: A critical skills curriculum to educate health professionals about rational prescribing		12/31/08	
Merck Institute of Aging and Health and the Society of General Internal Medicine (SGIM) Improving the care of older adults by practicing generalist physicians	Co-Principal Investigator, 5%	04/15/06 – 07/31/09	$200,000
Donald W. Reynolds Foundation Train-the-trainer grant in geriatrics	Investigator, 10%	09/01/04 - 08/31/10	$2,000,000
Health Services & Resources Administration (HRSA)/Bureau of Health Professions (BHP) Geriatric Academic Career Award (GACA) 1 K01 HP 00037-01 Faculty development of non-geriatricians to develop specialty specific curricula in geriatrics	Principal Investigator, 75%	09/28/07 – 09/27/10	$252,000

PUBLICATIONS
Peer Reviewed Original Contributions (Print)

1. Karani R, Likourezos A, Callahan EH, Thomas DC. An unfolding case with a linked objective structured clinical examination (OSCE): A curriculum in inpatient geriatric medicine. Acad Med. 2002 Sep; 77(9):938.

2. Karani R, Leipzig RM, Callahan EH, Thomas DC. An unfolding case with a linked objective structured clinical examination (OSCE): curriculum development. J Am Geriatr Soc. 2004 Jul; 52(7):1191-98.

3. Chheda SG, Karani R, Dunn K, Babott S, Bates CK. Update in Medical Education. J Gen Intern Med. 2008 Feb; 23(2):195-201.

4. Stark RA, Korenstein D, Karani R. Impact of a 360-degree professionalism assessment on faculty comfort and skills in feedback delivery. J Gen Intern Med. 2008 July; 23(7):969-972.

5. Karani R, Dunn K, Bates CK, Chheda SG. Update in Medical Education 2007. J Gen Intern Med. 2008 Dec; 23(12): 2106-2111.

6. Gliatto P, Masters P, Karani R. Medical student documentation in the medical record: a liability? Mount Sinai Journal of Medicine. 2009 Aug; 76:357-364.

7. Fromme HB, Karani R, Downing SM. Direct observation in medical education: A review of the literature and evidence for validity. Mount Sinai Journal of Medicine. 2009 Aug; 76:365-371.

8. Bradley SM, Karani R, McGinn T, Wisnivesky J. Predictors of serious injury among hospitalized patients evaluated for falls. J Hosp Med. 2010 Feb; 5: 63-68.

9. Bates CK, Chheda SG, Dunn K, Pinsky L, Karani R. Update in Medical Education 2008. J Gen Intern Med. 2010 May; 25(5):465-9.

10. Karani R, Chheda S, Dunn K, Locke K, Bates C. Update in Medical Education. J Gen Intern Med. 2011 Jan; 26(1):83-7.

11. Friedman E, Karani R, Fallar R. Medical student work duty hours: A national survey of Deans. Acad Med. 2011 Jan; 86(1):30-33.

12. Dinescu A, Fernandez H, Ross J, Karani R. Audit and feedback: An educational intervention to improve discharge summary completion. J Hosp Med. 2011 Jan; 6(1):28-32.

13. Goldberg G, Gliatto P, Karani R. Impact of a 1-week clinical rotation in palliative medicine on medical school graduates' knowledge and preparedness in caring for seriously ill patients. J Am Geriatr Soc. 2011; 59:1724-1729.

14. Dunn K, Chheda S, Bates C, Locke K, Karani R. Update in Medical Education 2011. J Gen Intern Med. 2012 Jan; 27(1):109-112.

15. Peccoralo L, Karani R, Coplit L, Korenstein D. A pocket card and dedicated feedback session to improve feedback to ward residents: A randomized trial. J Hosp Med. 2012; 7:35-40.

16. Mazurkiewicz R, Friedman E. Karani R, Lin JJ. Expectations for medical student work hours in inpatient clinical clerkships. Teaching and Learning in Medicine. (accepted).

17. Stossel L, Segar N, Gliatto P, Karani R. Readability of patient education materials available at the point of care. J Gen Intern Med. (accepted).

18. Castiglioni A, Aagaard E, Spencer A, Nicholson L, Karani R, Bates C, Willett L, Chheda S. Succeeding as a Clinician Educator: Useful Tips and Resources. J Gen Intern Med. (accepted).

Peer Reviewed Original Contributions (Non-Print)

1. Bradley SM, Karani R. Fall Risk Assessment Experience. MedEdPORTAL; 2010. Available from: http://services.aamc.org/30/mededportal/servlet/s/segment/mededportal/?subid=8022

2. Gliatto PM, Karani R. Gastrointestinal Bleeding Seminar. MedEdPORTAL; 2010. Available from: http://services.aamc.org/30/mededportal/servlet/s/segment/mededportal/?subid=8073

Other Peer Reviewed Publications

1. Karani R, McLaughlin M, Cassel C. Exercise in the healthy older adult. Am J of Geriatr Card. 2001 Oct; 10(5):269-73.

2. Karani R, Meier DE. Results from the Lasts Acts campaign: How can we improve? J Support Oncol. 2003 May-Jun; 1(1):69-72.

3. Fernandez HM, Karani R, Brand J, Leipzig RM, Soriano RP. That was the year that was: an evidence-based clinical geriatrics update 2002-2003. J Am Geriatr Soc. 2004 May; 52(5):828-837.

4. Karani R, Meier DE. Systemic pharmacologic postoperative pain management in the geriatric orthopedic patient. Clin Orthop Relat Res. 2004 Aug; 425(1):26-34.

5. Gliatto P, Karani R, Anand S. More about who should oversee preparation of the Dean's letter. Acad Med. 2012 Jun; 87(6): 680-1.

Invited Contributions

1. Karani R. Five Commonly Used Dietary Supplements in the Elderly. Focus on Healthy Aging. 2001 Feb.

2. Karani R. Zinc Supplementation in Older Adults. Focus on Healthy Aging. 2001 Sep.

3. Karani R. Melatonin: The Sleep Supplement. Focus on Healthy Aging. 2002 Nov.

4. Karani R. Tea: A Healthy Brew. Focus on Healthy Aging. 2003 Jun.

5. Karani R. Chelation for Chest Pain: The Evidence Remains Uncertain. Focus on Healthy Aging. 2003 Dec.

6. Karani R. Multivitamin and Mineral Supplementation. Focus on Healthy Aging. 2006 March.

7. Karani R. Chocolate and Cardiovascular Health. Focus on Healthy Aging. 2006 Nov.

8. Karani R. Perioperative Care. Focus on Healthy Aging. 2010 Feb.

Book Chapters

1. Karani R, Meier DE. Role of the Interdisciplinary Team in Urological Supportive Care (p 43-55). In Supportive Care of the Urology Patient. Norman R ed. Oxford University Press. 2005.

2. Karani R. Sleep Disorders in the Elderly (p250-266). In Fundamentals of Geriatric Medicine: A Case Based Approach. Soriano RP, Fernandez H, Cassel CK and Leipzig RM eds. Springer-Verlag. 2007.

Book Reviews

1. Karani R, Meier DE. Review for book proposal "Teamwork in Palliative Care." Oxford Medical Publications of Oxford University Press, Oxford, UK. 2004 May.

INVITED LECTURES AND PRESENTATIONS

1. Sexually transmitted diseases in the elderly, Mount Sinai Medical Center, New York, New York, March 15, 2001.

2. An evidence-based unfolding case with a linked objective structured clinical exam (OSCE): A curriculum in in-patient geriatric medicine, Brookdale Department of Geriatrics and Palliative Medicine Research Presentation, Mt. Sinai School of Medicine, New York, NY, April 4, 2002.

3. Developing an unfolding case and a linked objective structured clinical exam (OSCE) for your practice, Curriculum Series in Geriatric Medicine, Mt. Sinai Medical Center, April 18, 2002.

4. An unfolding case: development, implementation and evaluation of an inpatient geriatrics curriculum. Session developer, organizer and presenter. Workshop at the 2002 Annual Meeting of the American Geriatrics Society, Washington, DC, May 9, 2002.

5. That was the year that was: an evidence-based clinical update 2001-2002, Annual Meeting of the American Geriatrics Society, Washington, DC, May 11, 2002.

6. Visas for faculty and fellows, Association of Directors of Geriatrics Academic Programs, Scottsdale, AZ, January 19, 2003.

7. Case-based learning and performance-based evaluation: integrating geriatrics into an internal medicine curriculum. Session developer, organizer and presenter. Workshop at the 26th Annual Meeting of the Society of General Internal Medicine, Vancouver, BC, May 2, 2003.

8. That was the year that was: an evidence-based clinical update 2002-2003, Annual Meeting of the American Geriatrics Society, Baltimore, MD, May 16, 2003.

9. A clinical review of practice changing studies in geriatrics. Internal Medicine and Geriatrics Grand Rounds. Monmouth County Medical Center, Monmouth, NJ, December 4, 2003.

10. Evidence-based clinical update in geriatrics. 12th Annual Clinical Update in Geriatric Medicine, University of Pittsburgh Medical Center, Pittsburgh, PA, April 1, 2004.

11. Generalists teaching geriatrics: Assessment of the ACGME Systems-Based Practice Competency. Small group leader and presenter. Workshop at the Annual Meeting of the Society of General Internal Medicine, Chicago, IL, May 13, 2004.

12. Update in geriatric medicine: 2003-2004, Annual Meeting of the Society of General Internal Medicine, Chicago, IL, May 15, 2004.

13. Enhancing the diagnosis and treatment of neuromuscular conditions in older adults: a hands-on workshop. Small group leader. Workshop at the Annual Meeting of the American Geriatrics Society, Las Vegas, NV, May 19, 2004.

14. Case-based learning and performance-based evaluation: integrating geriatrics into the curriculum. Session developer, organizer and presenter. Workshop at the Annual Meeting of the American Geriatrics Society, Las Vegas, NV, May 19, 2004.

15. That was the year that was: an evidence-based clinical update 2003-2004, Annual Meeting of The American Geriatrics Society, Las Vegas, NV, May 20, 2004.

16. How doctors become doctors: undergraduate and graduate medical education. Presenter. Mini-Medical School Pre-course at the Annual Meeting of the Medical Library Association of the National Library of Medicine, Washington, DC, May 22, 2004.

17. Case-based teaching. Session co-facilitator. Geriatric Medicine Update and Board Review Course: Faculty Development. Workshop at Mount Sinai Medical Center, New York, NY, September 14, 2004.

18. Perioperative evaluation. Presenter. Geriatric Medicine Update and Board Review, Mount Sinai Medical Center, New York, NY, October 9, 2004.

19. Perioperative care: workshop. Workshop leader. Geriatric Medicine Update and Board Review, Mount Sinai Medical Center, New York, NY, October 9, 2004.

20. Curriculum development and instruction workshop. Session developer and facilitator. Workshop for geriatric medicine fellows, Mount Sinai Medical Center, New York, NY, October 28, 2004.

21. Undergraduate and graduate medical education. Presenter. Medical School Experience for the Health Science Library Association of New Jersey, Princeton, NJ, December 1, 2004.

22. The changing information needs of the hospital and clinic-based physician. Presenter. 2005 American Medical Publishers Association Annual Meeting, Philadelphia, PA, March 13, 2005.

23. Objective Structured Clinical Examinations: psychometrics and use in a competency based training system. General Internal Medicine Grand Rounds of the Samuel Bronfman Department of Medicine, Mount Sinai Medical Center, New York, NY, March 24, 2005.

24. Competency based curricula and evaluations in geriatrics: a practical approach. Session developer, organizer and presenter. Workshop at the Annual Meeting of the Society for General Internal Medicine, New Orleans, LA, May 12, 2005.

25. Teaching and giving feedback: an interdisciplinary approach. Co-presenter with Dr. Helen Fernandez. Palliative Care Continuing Education Grand Rounds, Hertzberg Palliative Care Institute, Mount Sinai Medical Center, New York, NY, June 14, 2005.

26. Models of care across the continuum: A US medical center's perspective. Session developer, organizer and presenter. Oral session at the XXI World Congress of the International Association of Gerontology, Rio de Janeiro, Brazil, June 27, 2005.

27. Perioperative care of the elderly. Geriatric Medicine Update and Board Review, Mount Sinai Medical Center, New York, NY, September 12, 2005.

28. Functional assessment of the older hospitalized adult. The Donald W. Reynolds Foundation sponsored mini fellowship: care of the hospitalized and homebound elderly, The New York Academy of Medicine, New York, NY, September 20, 2005.

29. Objective Structured Clinical Examinations: use in medical education. Medical Education Grand Rounds of the Institute for Medical Education, Mount Sinai School of Medicine, New York, NY, November 16, 2005.

30. Geriatrics in graduate medical education: Curriculum design, implementation and evaluation. Session co-developer and co-leader.

The Donald W. Reynolds Foundation 3-day mini fellowship: Geriatrics for Non-Geriatricians. The New York Academy of Medicine, New York, NY, March 6-8, 2005.

31. Collaborative peer mentoring for clinician-educators. Session developer, organizer and presenter. Workshop at the Annual Meeting of the Society for General Internal Medicine, Los Angeles, CA, April 27, 2006.

32. Immigration issues in geriatrics training programs and workforce. Session presenter. Precourse at the Annual Meeting of the American Geriatrics Society, Chicago, IL, May 3, 2006.

33. Age related changes and common geriatric syndromes. Presenter. Hospital-based Massage Therapy for Seriously Ill and Dying Patients. Lillian and Benjamin Hertzberg Palliative Care Institute of the Mount Sinai School of Medicine. New York, NY, May 20, 2006.

34. A collaborative peer mentorship program for clinician-educators. Presenter. Oral Session at the 2006 Association for Medical Education in Europe (AMEE) Conference, Genoa, Italy, September 16, 2006.

35. Perioperative care of the elderly. Geriatric Medicine Update and Board Review, Mount Sinai Medical Center, New York, NY, September 20, 2006.

36. Postgraduate education outcomes. Moderator and speaker. Research in Medical Education (RIME) Session at the 2006 Annual Meeting of the Association of American Medical Colleges (AAMC), Seattle, WA, October 29, 2006.

37. How to work with and give feedback to medical students in palliative care. Co-presenter with Dr. Gabriel Goldberg. Palliative Care Continuing Education Grand Rounds, Hertzberg Palliative Care Institute, Mount Sinai Medical Center, New York, NY, March 6, 2007.

38. Update in geriatric medicine: 2006-2007. Co-developer and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Toronto, Canada, April 26, 2007.

39. Feasibility and impact of a collaborative peer mentorship program. Oral research presentation at the Annual Meeting of the Society of General Internal Medicine (SGIM), Toronto, Canada, April 27, 2007.

40. Update in medical education: 2006-2007. Co-developer and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Toronto, Canada, April 27, 2007.

41. Mentorship for clinician-educators in geriatric medicine. Workshop developer and presenter. The Donald W. Reynolds Foundation Pre-AGS Workshop at the Annual Meeting of the American Geriatrics Society, Seattle, WA, May 2, 2007.

42. How doctors become doctors: undergraduate and graduate medical education. Presenter. Mini-Medical School at the Annual Meeting of the Medical Library Association of the National Library of Medicine, Philadelphia, PA, May 19, 2007.

43. Age related changes and geriatric syndromes. Presenter. Hospital-based Massage Therapy for Seriously Ill and Dying Patients. Lillian and Benjamin Hertzberg Palliative Care Institute of the Mount Sinai School of Medicine. New York, NY, May 20, 2007.

44. How Do I Tell Them That? Providing Feedback about Professionalism. Workshop developer, organizer and presenter. Workshop at the 2007 Association for Medical Education in Europe (AMEE) Conference, Trondheim, Norway, August 27, 2007.

45. Perioperative care of the elderly. Geriatric Medicine and Palliative Care Update and Board Review Course, Mount Sinai Medical Center, New York, NY, October 2, 2007.

46. Medical Education Journal Club. Discussant. Medical Education Grand Rounds, Mount Sinai Medical Center, New York, NY, January 9, 2008.

47. Update in medical education: 2007-2008. Co-developer, moderator and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Pittsburgh, PA, April 11, 2008.

48. Age related changes and geriatric syndromes. Presenter. Hospital-based Massage Therapy for Seriously Ill Patients. Lillian and Benjamin Hertzberg Palliative Care Institute of the Mount Sinai School of Medicine. New York, NY, June 1, 2008.

49. That's unprofessional! Strategies for giving effective feedback. Workshop developer, organizer and presenter. Workshop at the 2008 Association for Medical Education in Europe (AMEE) Conference, Prague, The Czech Republic, September 1, 2008.

50. Perioperative care and management. Geriatric Medicine and Palliative Care Update and Board Review Course, Mount Sinai Medical Center, New York, NY, September 15, 2008.

51. Teaching medical students geriatrics in the ambulatory care setting. Workshop for geriatric medicine faculty and fellows, Mount Sinai Medical Center, New York, NY, December 4, 2008.

52. Feedback Skills. Workshop for geriatric medicine fellows, Mount Sinai Medical Center, New York, NY, December 11, 2008.

53. Evaluating medical students. Internal Medicine Grand Rounds. Morristown Memorial Hospital at Atlantic Health. Morristown, NJ, February 18, 2009.

54. Defining core competencies in geriatric care. Medical Education Grand Rounds. Mount Sinai Medical Center, New York, NY, February 25, 2009.

55. Mount Sinai's new curriculum: Defining the competencies for the doctors of tomorrow. Medical Education Grand Rounds. Mount Sinai Medical Center, New York, NY, April 8, 2009.

56. Visas for faculty and trainees in geriatrics. Association of Directors of Geriatrics Academic Programs Pre-Course, Annual Meeting of the American Geriatrics Society, Chicago, IL, April 29, 2009.

57. Career success for clinician-educators: Setting a destination and charting a route. Workshop co-developer and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Miami, FL, May 3, 2009.

58. Update in Medical Education: 2008-2009. Co-developer, moderator and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Miami, FL, May 4, 2009.

59. Redirecting unprofessional behaviors: A practical approach. Workshop developer, organizer and presenter. Workshop at the 2009 Association for Medical Education in Europe (AMEE) Conference, Malaga, Spain, August 31, 2009.

60. Curriculum development: Putting theory into practice. Workshop developer, organizer and presenter. Workshop at the 2009 Association for Medical Education in Europe (AMEE) Conference, Malaga, Spain, August 31, 2009.

61. Integrating workplace-based assessment into medical training. Workshop developer, organizer and presenter. Workshop at the 2009 Association for Medical Education in Europe (AMEE) Conference, Malaga, Spain, September 1, 2009.

62. Perioperative evaluation and care. Geriatric Medicine and Palliative Medicine Update and Board Review Course, Mount Sinai Medical Center, New York, NY, October 5, 2009.

63. A Clinician-Educator Career in Geriatrics. Panelist, Metropolitan American Geriatrics Society Career Night, New York, NY, November 4, 2009.

64. Anatomy of Aging, Platform Presentation on Teaching Innovations in Anatomy. Experimental Biology 2010 Annual Conference, Anaheim, CA, April 27, 2010.

65. Update in Medical Education: 2009-2010. Co-developer, moderator and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Minneapolis, MN, April 30, 2010.

66. Curriculum Development: A Stepwise Approach. Pre-Conference workshop developer, organizer and presenter. 2010 Association for Medical Education in Europe (AMEE) Conference, Glasgow, Scotland, September 4, 2010.

67. Perioperative care of the older adult. Geriatric Medicine and Palliative Care Update and Board Review Course, Mount Sinai Medical Center, New York, NY, October 4, 2010.

68. Update in Medical Education: 2010-2011. Co-developer and presenter. Annual Meeting of the Society of General Internal Medicine (SGIM), Phoenix, AZ, May 5, 2011.

69. Feedback and Assessment of Third Year Medical Students. Co-Developer and presenter. Department of Family Medicine Conference, Morristown Memorial Hospital at Atlantic Health. Morristown, NJ, July 7, 2011.

70. Perioperative care. Geriatric Medicine and Palliative Care Update and Board Review Course, Mount Sinai Medical Center, New York, NY, September 19, 2011.

MEDIA RESOURCE EDUCATIONAL MATERIALS

Material	Role	Development time	Dissemination	Application

		and use		
Inpatient Geriatric Medicine Curriculum	Co - Developer	2000 - 2003	Presented at the 2000 Regional Society of General Internal Medicine conference, 2001 Annual Meeting of the American Geriatrics Society, and 2001 Annual Meeting of the Society of General Internal Medicine Peer reviewed article published in the Journal of the American Geriatrics Society, 2002	Development and implementation of Internal Medicine resident curriculum in inpatient Geriatric Medicine
Primary Care Update Series	Series director	2003	Presented 3-part CME series in primary care medicine	Design and review of presentations on sexually transmitted diseases, migraines and depression for practicing community physicians
Longitudinal Evaluation and Assessment Program	Collaborator	2004 – 2006	N/A	Design and implementation of a 2-year evaluation and assessment program for

				Geriatric Medicine Fellows
Outpatient Geriatric Medicine Curriculum	Co-developer	2004 - 2006	N/A	Design and implementation of Geriatric Medicine Fellow curriculum in outpatient Geriatric Medicine
Feedback Skills Workshop	Co-developer	2004 - present	Presented at the 2007 Association for Medical Education in Europe (AMEE) Conference, Trondheim, Norway, 2008 AMEE conference in Prague, Czech Republic	Design and implementation of a faculty development workshop for feedback skills
Master Geriatrics Educator Program of the Reynolds Train-the-Trainer Program	Co-developer and co-director	2005 - present	Presented at the Donald W. Reynolds Meeting at the 2006, 2007 and 208 Annual Meetings of the American Geriatrics Society	Design, implementation and evaluation of a year-long program in curriculum design, evaluation, feedback and medical education research for geriatric medicine faculty

Two curricula in inpatient geriatric medicine for 3rd year clerkship students	Co-developer	2005 - present	Presented in oral and poster form at the 2006 and 2008 Annual Meetings of the American Geriatrics Society, 2006, 2007 and 2008 Annual Meetings of the Society of General Internal Medicine and the 2007 Association for Medical Education in Europe (AMEE) Conference, Trondheim, Norway	Design, implementation and evaluation of two curricular methods in inpatient geriatrics for medical students
Merck Institute of Aging and Health and the Society of General Internal Medicine curricula in geriatrics for practicing physicians	Co-developer	2006 - 2009	Presented at the 2008 Annual Meeting of the Society of General Internal Medicine and the 2008 Annual Meeting of the American College of Physicians	Development, web launch and evaluation of 3 web-based modules on dementia, falls and urinary incontinence for community based practicing physicians
Mini Fellowship in Geriatrics of the Donald W. Reynolds Train-the-Trainer Program	Co-developer	2006 – present	Donald W. Reynolds Meeting at 2007 and 2008 Annual Meetings of the American Geriatrics Society	Design, implementation and evaluation of the Curriculum Design track within the mini-fellowship

				Co-development of overall course content and evaluation blueprint
Seniors-as-Mentors Year 3 curriculum, Mount Sinai School of Medicine	Co-developer	2007 – 2010	Presented in poster form at the 2009 Annual Meeting of the Society of General Internal Medicine	Development of modules on falls and function, medication risk assessment and ACOVE-3 for 3rd year medical students to use when evaluating senior adults in an outpatient setting
Megaloblastic anemia case for Molecules and Cells Course, Mount Sinai School of Medicine	Co-developer	2008 – present	N/A	Development of case and faculty guide for use in small group sessions of 1st year medical school Molecules and Cells course
Anatomy of Aging curriculum for Anatomy Course, Mount Sinai School of Medicine	Developer	2009 – present	Platform presentation at the 2010 Annual Experimental Biology meeting, Anaheim, CA.	Development of curriculum and faculty guides for two, 3 hour sessions on the Anatomy of Aging for 1st year medical students.

Investigator Education Skills Training Program (INVEST), Mount Sinai School of Medicine	Developer and Co-Director	2010	N/A	Development of a continuing professional development curriculum for eight, 2 hour sessions on teaching and curriculum design for PhD basic scientists.

SPECIAL COURSES

1. Intensive Course in Sexually Transmitted Diseases. Centers for Disease Control, New York, NY. April 1998.

2. Faculty Training in Addiction Medicine, Hazelden Foundation, Center City, MN. September 2000.

3. Program for Educators in the Health Professions, Harvard University, Boston, MA. January and May 2003.

4. Evaluation of Clinical Competence, Yale University, New Haven, CT. May 2004.

5. Building Palliative Care Programs in Hospitals, Center to Advance Palliative Care. Miami Beach, FL. March 2005.

6. Leading Innovations in Education and Health Care, Harvard University, Boston, MA. June 2010.

7. Medical Education Research Certificate, Association of American Medical Colleges (AAMC), New York, NY. March 2012.