Harvard Medical School Academy

RESIDENT/FELLOW AS TEACHER CURRICULUM SHOWCASE
ABSTRACT BOOKLET

Monday, September 15th, 2014
3:00 to 5:00 PM
Tosteton Medical Education Center
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**Symposium Overview**

**Overview:** The Resident as Teacher Interest Group from the Academy at Harvard Medical School (HMS) is sponsoring a showcase to highlight and share Resident/Fellow as Teacher programs and curricula from the Harvard training programs. HMS faculty and trainees will present some of their best offerings in Resident/Fellow as Teacher trainings, curricula, assessments, and other programming in order to share ideas.

**Learning Objectives:**

1. Apply novel curricular offerings and approaches in the clinical environment for training house staff as teachers
2. Give examples of effective Trainee as Teacher programs by becoming familiar with varied approaches to teaching skills development
3. Develop a multifaceted approach to the evaluation of trainee teaching skills curricula
4. Foster collaboration among residency and fellowship training programs with similar goals

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Faculty Chairs of Resident/Fellow as Teacher Curriculum Showcase

Richard Schwarzstein, M.D.
Tracey Cho, M.D., M.A.
Hope Ricciotti, M.D.

Resident/Fellow as Teaching Curriculum Showcase Review and Planning Committee

Meredith Atkins, M.D.
Alexander Carbo, M.D.
Tracey Cho, M.D., M.A.
Lauren Fisher, M.D.
Tara Kent, M.D.
Holly Khachadoorian- Elia, M.D.
Subha Ramini, M.D.
Hope Ricciotti, M.D.
Tom Sandora, M.D.
Amy Weinstein, M.D.
Lisa Frontado, MS EdM
Gillianne Jawahir
INNOVATIVE CURRICULUM FOR SECOND YEAR HST STUDENTS: IMPROVING CLINICAL SKILLS WITH VOLUNTEER PATIENTS GIVING IMMEDIATE FEEDBACK

Nadaa B. Ali, MD, Christine J. Chung, MD, Hamed Nayeb-Hashemi, MD, Derek Monette, MD, Stephen Pelletier, PhD, Helen Shields, MD; Department of Medicine, Brigham and Women’s Hospital Contact: nbali@partners.org; 504-250-1078

Background: The Association of American Medical Colleges (AAMC) report on Learning Objectives for Medical Student Education in 1998 emphasized skillful communication with patients and their families as an important learning objective in medical school. For the 2014 Introduction to Clinical Medicine (ICM) course, we created an innovative curriculum to prepare Harvard-MIT Health Sciences Technology (HST) students in the MD program using “real” patients from the new Brigham and Women’s Hospital Volunteer Patient Teaching Corps. These patients “role-played” their real life experiences and gave immediate feedback on students’ communication skills.

Methods: Patient volunteers were identified, and clinical scenarios customized to reflect their health care experiences. Scenarios ranged from delivering a cancer diagnosis to discussing medical mistakes, voluntary organ donation, and coronary artery disease with myocardial infarction in a young man, along with discussion of nursing home placement with the family of a patient with worsening Alzheimer’s disease or with an incapacitating stroke. Resident and faculty teachers were recruited to facilitate the interaction between patient volunteers and students and to give additional feedback. A total of 32 students were randomly divided into two groups. Group A participated in the workshop in week 11 of ICM; Group B participated in week 12. Each group was further divided into teams of 4 students. Each Teaching Team, composed of a resident or faculty teacher and patient, reviewed the case, objectives/goals, and teaching points prior to the workshop. Each of the 4 clinical scenarios lasted 18 minutes. The clinical scenario was taped to the door for students to read prior to entering the room. For week 11, we assigned each student a role. After anonymous student feedback, we modified the exercise to give each student an active role in the exercise and removed the passive roles of timekeeper and scribe. After each student role-played the part of the doctor, patients gave direct feedback on communication skills, supplemented by observations and recommendations from the resident or faculty teacher. Overall, each student had an opportunity to actively communicate in 50% of the clinical scenarios.

Results: All of the students (n=32) completed an anonymous written survey with a 100% completion rate. Overall, the two exercises combined were rated as excellent (on a Likert scale of 1 to 5 with 1 being excellent and 5 being poor) with a mean score of 1.468 (S.D. 0.621). The utility of real patients as teachers of communication skills received an overall excellent mean score of 1.218 (S.D. 0.608). Verbatim qualitative comments included: “Great cases, real patients, felt real,” “Amazing! Please keep and expand,” “I love the feedback at the end.”

Conclusion: An innovative second year student HST communications exercise received an overall excellent rating from the students. Immediate feedback from volunteer patients was the most highly praised and rated aspect of the exercise. We look forward to expanding the use of the Volunteer Patient Teaching Corps at HST and Harvard Medical School as a unique and powerful educational resource.
PEER-TO-PEER FEEDBACK PILOT IN A FACULTY-STUDENT CLINIC

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The Crimson Care Collaborative at Beth Israel Deaconess Medical Center (CCC-BIDMC) is a Harvard Medical School student-faculty clinic established in 2011 to provide care to individuals without primary care physicians (PCPs) or in between visits with their regular PCPs. CCC-BIDMC focuses primarily on chronic disease management, serving patients with hypertension, diabetes mellitus, and obesity. One night each week, teams consisting of a Junior Clinician (1st/2nd Year Medical Student) and Senior Clinician (3rd/4th Year Medical Student) interview and examine patients, and then consult with an attending physician before developing a treatment strategy.

In addition to delivering high quality care to patients with chronic diseases, CCC-BIDMC provides an avenue for Junior Clinicians (JCs) to broaden their medical knowledge and sharpen their clinical skills, and Senior Clinicians (SCs) to hone their teaching and leadership abilities before graduating to residency. Providing feedback to JCs and SCs to help them reach these goals is essential — without feedback, mistakes go uncorrected, good performance is not reinforced, and it is difficult to ensure competence.1 Currently, there is no permanent system in place for JCs or SCs to receive formal feedback on their performance.

The CCC-BIDMC Medical Education Committee has developed a Peer-to-Peer Feedback Pilot to address this gap. Two online surveys (see appendix) have been created, the links to which are provided to JCs and SCs by email after each clinic. The survey SCs use to provide feedback to JCs is adapted from the Harvard Medical School Communication Skills Assessment (see appendix), which is used to evaluate medical students’ ability to communicate effectively with patients before they transition to the wards. The survey JCs use to provide feedback to SCs focuses on teaching, collaboration, and leadership skills. Results are forwarded immediately to JCs and SCs by email.

By allowing students to provide feedback directly to one another, the online Peer-to-Peer Feedback Pilot uses a “near-peer” teaching model (in which medical students at similar stages in their training teach each other) that bypasses common barriers to effective feedback. Whereas students often feel pressured to conceal areas of weakness from faculty2, peers represent non-threatening messengers of constructive feedback. Furthermore, faculty often precept multiple students and are unable to observe students for a time period adequate to evaluate their performance; in contrast, JCs and SCs work on a peer team for the duration of the clinical encounter. Finally, face-to-face feedback is often limited by lack of time, privacy, and a framework in which to provide it.1 The Peer-to-Peer Feedback Pilot provides JCs and SCs with a forum to deliver feedback at their convenience using a short, 6-item survey with questions that are relevant to each student’s stage in his medical education.

Since the Feedback Pilot launched in March 2014, 60 students have completed the surveys (27 SCs and 33 JCs), and the results reveal both areas of strength and opportunities for improvement. SC to JC feedback shows that while 25 of 27 JCs elicited patients’ beliefs, concerns, and expectations about illness and treatment, only 16 of 27 SCs “strongly agreed” that the JC used an organized, logical approach. Similarly, JC to SC feedback shows that while 29 of 33 SCs did an excellent job creating an environment in which JCs felt comfortable asking questions, only 21 of 33 JCs believed their SCs did an excellent job communicating teaching points about the patient’s case. General comments on what SCs and JCs did well and what they can improve have been targeted and actionable. The results suggest that a
formal Peer-to-Peer Feedback Program may assist the student-faculty clinic in identifying areas for improvement and providing opportunities for students’ continued growth.

Looking forward, the Medical Education Committee plans to assess the utility of Peer-to-Peer Feedback by surveying SCs and JCs at the end of the summer term. If the usefulness of the tool can be established for a majority of users, a Peer-to-Peer Feedback Program will be formally instituted at the CCC-BIDMC site. Having built a Peer-to-Peer Feedback Program at CCC-BIDMC, the model would then be available for other CCC sites to adopt. Ultimately, introducing a formal feedback program with a “near-peer” teaching model has the potential to enhance JC learning prior to the wards, improve SC leadership before residency, and modify CCC-BIDMC (and other CCC site) practices to best meet the needs of students and the patients they serve.
This year, the Crimson Care Collaborative – Beth Israel Deaconess Medical Center (CCC-BIDMC) Medical Education team spearheaded the development of the CCC-BIDMC Medical Education blog. CCC-BIDMC is a Harvard Medical School student-faculty collaborative practice established in 2011 to provide care to individuals without primary care physicians or in between visits with their regular primary care physicians. CCC-BIDMC focuses on chronic disease management, specifically hypertension, diabetes mellitus, and obesity.

CCC-BIDMC has several student-run committees, including the Medical Education team. The team launched the CCC Medical Education blog in response to an assessment survey conducted by Dr. Pamela D. Vohra, a former instructor in medicine at Harvard Medical School and primary care physician at BIDMC. The team hoped the blog would foster a stronger CCC community and improve communication and learning.

Each week, students post an “image of the week” to the blog, which is discussed during the pre-clinic didactic that occurs before every Tuesday evening clinic. Having Junior and Senior Clinicians (first/second and third/fourth year medical students, respectively) study the image before or at the beginning of clinic and then engage in a discussion led by the “Senior Director” (usually a fourth year medical student) models the increasingly popular “near-peer” teaching initiative. Near-peer teaching is an innovative educational format “which utilizes tutors who are more advanced in a curriculum’s content to supervise students’ activities and to act as instructors in laboratory settings.” Medical schools and residency programs across the country and internationally are rolling out and evaluating near-peer education as a means of fostering interprofessional teamwork in medical settings.

Image of the week near-peer teaching topics at CCC-BIDMC include both acute and chronic primary care clinical issues such as the classic malar rash of lupus, herpes, and Raynaud’s phenomenon, in addition to images relating to the three main illnesses around which the CCC-BIDMC clinic is focused. In addition to fostering a sense of community and improving communication, the CCC-BIDMC Medical Education team leadership believed the blog would serve as a record of the topics covered in didactic session and would help bridge the gap between students on rotating, busy schedules who want to stay up to date on talks, didactics, and other events.

Students have also used the forum to write about policy issues (using taxing and banning policies to forward public health measures), discuss conferences (Student-Run Free Clinics Conference), reflect on relevant New York Times articles, and summarize and comment on the pre-clinic didactic sessions. These lengthier contributions are made by a diverse group of students, including undergraduates, medical students, and other volunteers with access to near-peers for feedback. We hope to encourage more of this diverse student reflection in 2014-2015 and want to invite more interprofessional contribution moving forward (from pharmacy, nurse practitioner, and public health students, for example).

Looking forward, the Medical Education team hopes to expand the blog to include other CCC sites (Massachusetts General Hospital – Internal Medicine Associates, Massachusetts General Hospital – Chelsea, Massachusetts General Hospital – Revere (Pediatrics), and Cambridge Health Alliance) in order to foster greater cooperation between Harvard CCC sites, provide common educational material, exchange ideas, and serve as a platform to propose and discuss CCC best practices and innovations.
EFFECTIVENESS OF THE HARVARD DERMATOLOGY RESIDENT-AS-TEACHER PROGRAM

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Background: Since 2012, the Resident-as-Teacher Program in the Harvard Department of Dermatology has comprised interactive instructional sessions for small groups of residents and the provision of feedback to second- and third-year residents on their small group, case-based discussion skills. Instructional topics include adult learning theory, best practices for facilitating small and large group discussion, and teaching with patients.

Objectives:
1. To assess residents’ enjoyment of teaching, knowledge of teaching techniques and attitudes towards teaching before and after participation in the program.
2. To gather participants’ perceptions of each interactive session.
3. To assess which teaching skills were learned from the interactive sessions and the feedback after observed small group teaching.

Methods: An anonymous questionnaire was administered before, directly after, and 4 to 8 months after the program to assess residents’ enjoyment of teaching in various settings, knowledge of teaching principles, and confidence in their teaching abilities. Residents completed a feedback questionnaire after each interactive session. Residents received feedback from an experienced clinician educator on observed teaching sessions and described changes they would make to their future teaching. Descriptive statistics and paired t-tests were used to analyze questionnaire responses.

Results: 23 residents have completed the program thus far. After participation in the program, residents reported greater enjoyment of teaching, knowledge of teaching principles, and confidence in their teaching abilities. At 4 to 8 months, these improvements were sustained with mild attenuation. Residents enjoyed the interactive nature of the discussion sessions and the range of teaching techniques used. 100% of residents felt that they had achieved their goals in participating in the program and they reported learning a broad range of skills.

Conclusions: The Harvard Dermatology Resident-as-Teacher Program has improved residents’ knowledge of teaching techniques and confidence in their own abilities – changes that are sustained over time. We plan to further study the program’s effectiveness and to schedule observed teaching sessions in parallel with formal instruction.
THE HARVARD DERMATOLOGY RESIDENT-AS-TEACHER PROGRAM

Susan Burgin, M.D.1, Lori Newman M.Ed. 2

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ABSTRACT

Background: The Harvard Dermatology Resident-as-Teacher Program was initiated in 2007. Until 2012, it centered on the provision of formal feedback to residents on their small group, case-based discussion skills. In 2012, small group instructional interactive sessions were added.

Program design: Two to 3 residents receive 4, 90-minute interactive instructional sessions over a 2-month rotation. Instructional sessions are designed to model best practices. Learners are active participants and session content is modified each rotation based on learners’ self-identified needs. A variety of teaching materials and methods are used to engender discussion, such as video clips, completing a learning style inventory and role play. Participants’ feedback is sought after each session, which guides future such sessions. Residents teach medical students in small groups monthly. They also teach co-residents in the annual “Art of Differential Diagnosis” course. An experienced clinician educator observes each teaching session using a checklist of effective teaching criteria. Confidential feedback is provided immediately after the session.

Instructional sessions: Instructional topics include:
1. “Introduction to teaching and learning”: Participants share their teaching background and enjoyment; the educational contract is modelled. Learning styles and adult learning theory are explored through the Kolb inventory. Attributes of great teachers are explored; participants are encouraged to take on a new attribute. We discuss how to create a positive learning environment.
2. “How to give an effective lecture”: A video clip of uninspiring teaching is used as a springboard for discussion. Participants are led in an interactive discussion around lecture preparation and effective delivery. Video clips and instructor role play are used to model best practices for the beginning, middle and end of a lecture.
3. “Best practices for small group teaching”: a small group discussion is facilitated around a video that we watch. We then deconstruct our discussion and the use of questions, listening and responding and other small group discussion techniques are highlighted. We role play a small group where a disruptive and a quiet learner join. We discuss other interactive techniques such as break-out groups and the quick write.
4. “Teaching with patients”. Residents choose between discussing teaching in the ambulatory setting, teaching in the inpatient setting, or teaching how to do a skin biopsy. Skills such as the one-minute preceptor and bedside teaching are covered.

Conclusions: 23 residents have completed the instructional sessions. Feedback on observed teaching has been given on more than 70 occasions. The program has been enthusiastically received and has been found to be effective with sustained changes in teaching knowledge and observed change in residents’ teaching performances.1, 2

ENGAGING EMERGENCY MEDICINE RESIDENTS IN ULTRASOUND EDUCATION THROUGH MICROBLOGGING TECHNIQUES

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Brigham and Women's Hospital, Division of Emergency Ultrasound

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The Harvard Affiliated Emergency Medicine Residency (HAEMR) Program requires a 4 week ultrasound rotation in the first year of training. The curriculum consists of weekly assigned readings and integrated hands-on scanning, image review, resident presentations, and didactics at 3 teaching sites. A new microblogging series (via Twitter) is being introduced to further engage learners beyond formal instruction. Over 56 pre-written entries reflect the topics for each week's reading assignments; they are formatted as short quizzes, image challenges, technical tips, and digital resources. Entries are stored in a cloud-based spreadsheet and scheduled to publish 2 to 3 times daily through an automated online platform--this allows for all pre-written content to be re-delivered with each new rotator.

Microblogging was chosen as a teaching tool because of its brevity and mobile accessibility. The 140 character limit allows for concise content delivery and encourages focused reciprocity from its participants. Twitter has been shown to sustain learner engagement and promotes learner interactions (Gao et al., 2012). Research conducted by Junco et al. (2011) noted that Twitter encouraged involvement from those students who otherwise may not be active participants because it allows for opportunities to communicate at any time. Therefore, emergency medicine housestaff can benefit greatly from this mode of informal learning because they are connected with educational materials and sustain a virtual presence among their academic peers despite having irregular schedules.

Due to the technical emphasis of ultrasound education, interactive curricula like Twitter is well suited to supplement the growing library of online and digital materials. Additionally, ultrasound educators contribute brief but valuable expertise not typically offered in more traditional formats. Learners are given a direct and rapid platform to reflect on real-time challenges and ask questions during their rotation. Further research is needed to evaluate the efficacy and impact of Twitter for use in ultrasound education and other areas of medical education.

References
DEVELOPING AN OBJECTIVE STRUCTURED ASSESSMENT TOOL FOR LAPAROSCOPIC SUTURING

Co-Investigators: Olivia H. Chang, M.D., M.P.H.; Anna Merport Modest, M.P.H.
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Background: It is difficult to objectively assess advanced laparoscopic skills for summative feedback during residency surgical training. Current assessment systems for minimally invasive procedures are overly complex, such as the Observational Clinical Human Reliability Assessment System (Tang 2004). Thus, an objective assessment of surgical skills that is reliable, valid and has interrater reliability is needed.

Methods: All BIDMC OB/GYN residents and 3rd year Harvard Medical Students on the OB/GYN rotation were approached for this study. Participants are asked to perform the laparoscopic task and the completion of a de-identified demographics form (with a study ID). All laparoscopic suturing performances will be recorded in an anonymous fashion with the Apple software via the camera installed as part of the laparoscopy towers. Two reviewers will assess the videotapes and score the participants’ suturing and intracorporeal knot tying performance using the Objective Structured Assessment of technical skills (OSATS) and global rating checklist.

Results: Upon completion of this study to be held on 7/28/14, OSATS scores for each video will be promptly analyzed for inter-rater reliability reliability. The inter-rater reliability will serve to compare to the number of events agreeable between two reviewers over the total number of events. A strong inter-rater reliability will be a value ≥ 0.8 (Gallagher 2003). In addition, OSATS scores will be analyzed for construct validity by level of training, surgical experience, and extent of simulation practice.

Conclusion: Upon completion of this study, the goal is to provide an assessment tool that may be used at various institutions to help trainees improve their laparoscopic skills. The benefit of this tool is that it identifies each step of the laparoscopic task to allow for precise feedback. Ultimately, trainees may be able to use the feedback from this tool and enhance their real-time operating skills.


EVALUATION OF THE STRESS MANAGEMENT AND RESILIENCY TRAINING (SMART) CURRICULUM FOR INTERNS

Presenters:
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Laura Byerly, MD PGY3, MGH Internal Medicine Residency Program
Grace Peloquin, MD PGY3, MGH Internal Medicine Residency Program
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Background: Over the past decade, the ACGME and residency training programs across the country have attempted to address physician burnout. Initiatives like work-hours regulation support resident health, however the consequences of physician burnout extend beyond training, affecting physician health, patient care and safety, as well as health systems. i,ii,iii,iv,v,vi,vii,viii,ix Thus, our trainees would benefit from a learned skill-set to sustain resilience throughout their careers. Preliminary studies amongst primary care physicians demonstrated that mindfulness training programs effectively lower stress, improve ability to cope, improve mood, increase physician empathy and decrease burnout. x,xi xii Furthermore, physicians who practice mindfully are more likely to find meaning in their work.xiii Since loss of meaning and empathy, stress and perceived loss of control characterize physician burnout, mind-body interventions such as mindfulness training have been suggested as a solution.xiv In collaboration with the Benson Henry Institute (BHI) for Mind Body Medicine at Massachusetts General Hospital, a resident-initiated Resiliency Curriculum was adapted from the BHI’s Stress Management and Resiliency Training (SMART) Program, developed and implemented for the 2014-2015 intern class in the departments of Medicine and Psychiatry. An intervention cohort study is being conducted to investigate the impact of this mind-body intervention on first year residents’ emotional and physical wellbeing, stress, and overall resiliency.

Methods: The SMART Curriculum for Interns was implemented in June 2014 during Intern Orientation, and is ongoing. The curriculum is mandatory for all interns as part of the resident didactic curriculum in the Departments of Medicine and Psychiatry. Interns were consented to participate in a study of this curriculum, which includes 1) a pre-test post-test design, which includes surveys evaluating health behaviors, stress, coping, quality of life, psychiatric and medical symptoms, mindfulness and empathy; and 2) continuous remote physiologic and health behavior tracking using the commercial device, Basis. The Basis is a wearable health-tracker that measures heart rate, skin conductance, skin temperature, and 3-axis accelerometry, allowing the monitoring of sleep quality and activity (i.e., walking, running, and biking).

Results: Of 85 interns who qualified for the study, 75 consented to participate in the study; of these, 72 consented to wear the Basis health tracker. Preliminary feedback and Basis data illustrate robust participation and enthusiasm amongst interns.

Conclusions As a pilot, the SMART curriculum aims to: 1) teach the importance of mind-body practice, 2) empower residents to pursue wellness, 3) teach skills that
nurture resiliency. The goal of this initiative is to establish a resiliency curriculum, determine its feasibility as part of residency training, and measure its efficacy as a means to nurture resiliency and counteract burnout.


APPLYING THE PSD MODEL TO MEDICAL EDUCATION: 
DESCRIPTION OF A NOVEL RESIDENT-AS-TEACHER CURRICULUM IN AN OB/GYN STUDENT CLERKSHIP

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Abstract
The combined surgical-medical environment on the Obstetrics and Gynecology (OB/GYN) core clerkship challenges medical students to learn effectively as well as residents, who play a significant role in teaching during the clerkship, to teach efficiently. The need for an efficient and effective approach for teaching and assessing students’ performance has never been more essential in OB/GYN departments. In this abstract, we describe a novel part of the Resident-as-Teacher (RaT) curriculum that we have designed and developed through embedding a simple and useful 3-stage model called “PSD” (preparation, scaffolding, and debriefing) in the OB/GYN clerkship to guide residents’ teaching and medical students’ learning at Brigham and Women’s Hospital. To increase students’ level of preparedness for clerkship learning and to decrease the RaT barrier caused by students’ readiness to learn, we developed four Must-Do Lists and four Roles of Student Lists by clinical settings. For example, medical students are defined as resident assistants in the operating room, and suggested to assist the resident to complete a basic two-person job, such as suturing. In order to complete the basic two-person job, the student is asked to meet the prerequisite -- able to perform basic surgical techniques and able to identify different surgical instruments – based on the corresponding Must-Do List. To improve students’ learning experience and outcomes, we appointed a Resident Coach for each student during the clerkship to help them adapt to the OB/GYN settings quickly; to move students progressively towards stronger understanding and, ultimately, greater independence in the clerkship. To minimize the RaT barrier of time restraint, a TDA (teaching, directing, and assisting) technique, which was derived from our recent research finding, was introduced to our resident teachers. Our recent study also revealed that 1) the resident coach served as an effective way to rapidly improve students’ adaptability and proactivity during clerkship, and 2) all resident coaches felt the workload and commitment were appropriate and would like to serve as coach again. Finally, to better facilitate the debriefing section, we encouraged our resident teachers to provide instant specific feedback to medical students. Evaluation data about this novel RaT curriculum including feedback from resident coaches as well as medical students’ performance data are in the process of ongoing collection. This curriculum is well supported by established theories and multiple studies in the literature.
Developing Fellows as Medical Educators in Obstetrics and Gynecology

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Background: A recent survey of the BHW/MGH Integrated Residency Program in Obstetrics and Gynecology indicated that residents identify fellows as a source of valued and effective teaching more often than either senior residents or faculty members. Indeed fellows, having just completed residency, are well-positioned to provide relevant, focused training to residents on topics within their chosen subspecialty field. The majority of fellows move on to junior faculty positions, with an expectation to continue teaching. However, fellows in OB/GYN are not typically offered any directed training to advance or develop their skills as a medical educator.

Methods: A planned survey of current and recently graduated fellows in the departments of Ob/Gyn at both BWH and MGH will determine curricular needs and priorities. The survey will assess 1) current educational responsibilities, 2) past and current training received relevant to teaching skills, presentations, or curricular development and 3) desire for additional training on specific topics in medical education. Fellows will also be asked to indicate preferred formats for the proposed training. The program may consist of a combination of online modules, discussion groups, peer observation, and visiting speakers depending on the identified needs. Pre- and post-course evaluations will be collected to assist in further improvement of the curriculum. Potential learning objectives include:

- Review of strategies to engage learners, develop curricula, and promote effective learning for trainees at all levels
- Experience in observing, demonstrating and improving on techniques for teaching in clinical rounds, procedural teaching, small-group discussion, large group lectures, giving feedback to learners and methods of evaluation

Summary: The proposed program to develop fellows as medical educators in Obstetrics and Gynecology should provide opportunity to enhance teaching skills, and intends to advance medical education as a priority both during fellowship training and in future academic practice. Senior residents and faculty of all levels will also be encouraged to participate as a means of promoting a culture of prioritizing effective teaching within the OB/GYN training programs at BWH and MGH.
CREATING A NEW GENERATION OF CLINICIAN EDUCATORS: THE CREATION AND IMPLEMENTATION OF A RESIDENT AS EDUCATOR CURRICULUM FOR PEDIATRIC SENIOR RESIDENTS LEADING MORNING CASE CONFERENCE

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**Background:** Senior residents are expected to lead “morning report,” a case conference, in many residency programs, yet they are not consistently or systematically taught how to do so, leading to conferences of variable quality and creating a missed opportunity to improve resident teaching skills. In order to both improve the quality of our morning reports and to simultaneously create an opportunity to emphasize the resident role as a clinician educator, the MGH/C Pediatric Residency Program created and implemented a Resident as Educator curriculum for residents leading morning case conferences.

**The Curriculum:** Each senior resident spends two to four weeks in the role of “ward teach” during which time each leads morning report twice per week and one noon conference. We pair each resident with a pediatric faculty mentor who has received training in the curriculum. The pair has six 15-30 minute sessions together. The first is dedicated to determining the resident’s personal goals for the rotation. All of the other sessions occur after the resident has led a teaching session and the first part of the session focuses on giving the resident feedback on the teaching session with the resident’s particular goals in mind. The second session also is spent discussing an area of andragogy and educational practice; the resident is given a list of topics (including such topics as “writing goals and objectives,” “preparing for conference in 2 hours or less,” and “making the most of your 45 minute conference”) from which to choose. Each topic has assigned readings and a worksheet for the pair to discuss and complete together. The third session is spent preparing for the resident’s noon conference; the noon conference is a time for the resident to present an area of interest to showcase his/her teaching strengths. The fourth session, which occurs after the noon conference, is a reflection session on that teaching encounter. The fifth session is another session during which the resident can choose a topic on adult education from the topic list to discuss with the faculty mentor. The last session is a feedback session in which the pair gives each other feedback structured by feedback questionnaires.

**Feedback from the participants:** We conduct resident surveys before and after the rotation each year and surveyed the faculty at the end of the 2013-2014 academic year. This year’s data shows that residents feel the experience improves their confidence and comfort with leading morning report. Based on reported resident perceptions, the biggest changes in understanding occurred in the areas of understanding adult learners, writing objectives, creating and using outlines, making use of experts, creating a safe atmosphere for learning, and gauging audience needs. The areas which residents reported still feeling less comfortable included determining the appropriate level of discussion and evaluating their learners. The residents felt having a faculty member present for support was extremely important, as were being observed and getting feedback on their teaching. The faculty rated the experience very highly when put in the context of all of the areas of their duties and felt the one-on-one resident interaction was an overwhelmingly positive outcome, although they wished there was more time for discussion. Overall, the experience has been a positive one for both the residents and the faculty and has transformed the emphasis on their roles as educators in our residency program.
A SIMPLE SIMULATION EXERCISE TO DEVELOP CLINICAL REASONING SKILLS OF MEDICAL STUDENTS ROTATING ON INPATIENT WARDS

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OBJECTIVE: Caring for hospitalized patients provides a unique learning opportunity for medical students because it requires efficient clinical reasoning and management of diagnostic uncertainty. Here we describe a novel simulation exercise designed to develop and refine clinical reasoning skills of medical students rotating on an inpatient ward.

DESCRIPTION OF EXERCISE: Learning objectives for 10 clinical presentations common in internal medicine (including chest pain, shortness of breath, and gastrointestinal bleeding) were identified. A list of one-liners for 10 fictitious patients, one for each clinical presentation and learning objective, was prepared and provided to third-year medical students on their inpatient medicine rotation. Students were oriented to the simulation exercise and informed they would be cross-covering these 10 patients and responding to clinical problems arising throughout the rotation. Students were informed that the instructor would page them periodically role-playing as a nurse caring for their patients. Teaching pages were sent to students during short breaks in clinical duties alerting them to a new problem or change in clinical status. Students were then asked to articulate the clinical reasoning supporting their initial assessment, focusing on identifying relevant historical and physical exam features. Socratic questioning was used to identify additional data required to effectively manage the patient, with consideration of how quickly such information would become available and how it would alter management. Finally, students were asked to identify and prioritize the most important diagnostic and therapeutic measures for the clinical scenario, as well as the next steps in management. At the end of each discussion, feedback was provided to the student.

SAMPLE EXERCISE: A sample learning objective, one-liner, teaching page, and student assessment are provided below (only the one-liner is provided to students initially):

1) Learning objective: Describe the initial steps in evaluation and management of a patient with an acute gastrointestinal bleed and hemodynamic instability.
2) One-liner: “Mr. Green is a 56/M w/ GERD and diverticulosis admitted w/ PE, on heparin gtt, started Coumadin 2d ago, likely discharge tomorrow.”
3) Teaching page: “Mr. Green just had 2 large bright red BMs, is now pale & diaphoretic, HR 125 BP 94/62 RR 25, please come to bedside STAT.”
4) Student assessment: Acute GIB in an anticoagulated patient. Tachycardia and hypotension are evidence of hemodynamic instability. Anticoagulation should be stopped and, if necessary, reversed. He needs IV access, a PPI, blood transfusion, and close monitoring; he may require hemodynamic support and ICU transfer.

CONCLUSIONS: This simple simulation exercise is a highly portable, adaptable, and engaging tool that can be tailored to the educational needs of learners while developing their clinical reasoning skills. It can be used with minimal preparation during short breaks in clinical duties. Socratic questioning may be extended to incorporate other core concepts like pre-test probability, high-value care, and Bayesian inference with ease.
A RESIDENT-LED MEDICAL SIMULATION PROGRAM FOR INTERNAL MEDICINE INTERNS

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Since inception in 2012, the Massachusetts General Hospital (MGH) Department of Medicine simulation program, led by a group of resident leaders and two faculty advisors, has been charged with developing and delivering a simulation curriculum focused on medical decision-making to MGH internal medicine (IM) interns. Fall cases run from July to October and focus on diagnostic and therapeutic dilemmas encountered on the general hospital ward, such as atrial fibrillation with rapid ventricular response, acute alcohol withdrawal with agitation, NSTEMI with NSVT, and hypertensive emergency. Spring cases run from March to June and focus on critical care concepts, including massive PE, complete heart block with hypotension, and STEMI with cardiogenic shock.

In academic year 2013-14, interns completed 14 unique cases developed by resident simulation leaders. Interns worked in pairs or groups of three to maximize participation. Cases were facilitated by volunteer junior (PGY-2) and senior (PGY-3) residents. Faculty advisors provided facilitation and debriefing training to resident facilitators. During the 2013-14 academic year, 52 interns participated in 192 hour-long sessions which were facilitated by 48 volunteer resident facilitators (representing 44% of all junior and senior residents). Resident facilitators participated in a mean of 7.7 sessions (interquartile range 2 - 11.3).

In comprehensive surveys of the two most recent intern classes (2012-13 and 2013-14), 97% of respondents agreed that the curriculum made them better able to manage acutely ill inpatients. 92% felt that the cases accurately depicted real clinical scenarios. Only 27% felt that attendings should participate in facilitation in addition to residents. In addition, a survey of 34 resident facilitators demonstrated that the program enhanced their teaching and feedback skills.

The MGH simulation program uses relatively few faculty resources to deliver a high-quality and comprehensive educational experience to now over 70 interns annually. Our design may serve as a model for other IM residencies seeking to develop a simulation program with benefit to all postgraduate classes.
A MULTILEVEL APPROACH TO MEDICAL EDUCATION: DEVELOPMENT OF A MEDICAL EDUCATION STUDENT INTEREST GROUP AT HMS

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Background: While The Academy at Harvard Medical School (HMS) provides a community for faculty members to foster their interest in medical education, no such group exists for students interested in becoming clinician educators. In line with the philosophy of The Academy, we believe high quality medical educators are trained early on in their career, and students play a valuable role in the constant improvement of their education. Currently, there are few standardized resources available for medical students to explore careers in education, and while teaching skills are emphasized at the resident and faculty level, formal educational training for medical students is lacking.

Methods: In the Spring of 2013, twenty-seven medical students responded to a faculty request to form a student interest group focused on medical education. Initial meetings were in conjunction with five faculty members of The Academy, with later meetings being conducted by medical students with the help of a faculty advisor. Over the course of three planning meetings, topics of interest and goals for the group were defined.

Results: The following goals were established in the group’s mission statement: “We aim to foster student interest in future careers in medical education, participate in and support student-to-student educational efforts, and collaborate with faculty in the conception and implementation of education reforms.” In this spirit, the interest group planned and executed a session in May 2013 titled “Teaching as an Intern.” The event provided pedagogical tools and methods for educating trainees in the clinical setting and included best practices from current residents and faculty. In the fall of 2014, the group trained fourth year medical students in education theory and lesson design in preparation for co-teaching of didactic and simulation sessions with faculty members in pre-clinical courses. Spring 2014 events included a workshop for PGY-2 students on “Seeking and Using Feedback in the PCE,” a lunch talk on innovations in medical education, and a presentation at Medical Education Grand Rounds on “Students as Teachers: Creating Opportunities for Senior Medical Students to Teach Junior Medical Students in Courses and Clerkships.” The interest group meets monthly to continue work on such projects and also hosts journal club discussions and invited speakers.

Conclusion: With the formation of a student-led interest group for medical education, we found significant student interest in teaching opportunities, efficient organization of education-related activities, and representation of student interests in the field of medical education. The group is planning further projects, including a workshop for incoming students on teaching while learning, an online video lessons library, and a dinner event with experts in the medical education field. Progress will continue to be evaluated by the use of student surveys and organized reflection by students and faculty.
FOSTERING THE TEACHING SKILLS OF INTER-PROFESSIONAL FELLOWS IN ADOLESCENT HEALTH

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Introduction: The MCHB-funded Leadership Education in Adolescent Health (LEAH) fellowship at Boston Children’s Hospital trains interprofessional fellows to lead innovations in program development, clinical services, public health, and research for adolescents and young adults. Post-graduate fellows in medicine, nursing, nutrition, public health, psychology, and social work participate in a one-year longitudinal curriculum designed to foster skills in advocacy, leadership, research design and program evaluation in addition to discipline-specific clinical skills. In recognition that leadership in any capacity will involve teaching as well, the curriculum has included a longitudinal teaching workshop since 1993.

Program Description: The LEAH Teaching Workshops consist of four half-day sessions, a teaching laboratory accompanied by peer observation and feedback, and a final education retreat for Division faculty as well as fellows. Workshops are purposely held off-site away from the clinical and administrative offices of the Division to foster a sense of retreat and reflection on the fellows’ educational mission. Prior to the first session, fellows complete the Kolb Learning Style Inventory as well as a needs assessment identifying their professional development needs related to teaching. The first session is grounded in Kolb’s Experiential Learning Theory. Fellows are introduced to Kolb’s theory, reflecting on memorable learning experiences and hypothesizing which of Kolb’s four quadrants were engaged during these experiences. Fellows are also oriented to the peer observation of teaching and feedback process and the LEAH teaching laboratory. The teaching lab consists of 8 core topics in adolescent health taught by fellows to pediatric residents from the Boston Combined Residency Program during 8 hour-long sessions that recur monthly. Fellows identify one of these topics to teach and are paired with another fellow for observation and feedback. In advance of the second session, fellows create a lesson plan for their LEAH teaching laboratory based on Handsman’s principles of scientific teaching. During the second session fellows participate in an interactive session led by Dr. Bryn Austin that covers creation of learning objectives and purposeful design of in-class exercises. Fellows then examine and receive feedback on their lesson plan in triads. For the third session, fellows are instructed to bring a teaching challenge or novel instructional strategy to try out during a microteaching exercise. Fellows use the process of group consultative feedback during this microteaching session. For the final session, fellows prepare a 5-minute interactive teaching segment using Powerpoint designed to “sell an idea.” Fellows practice teaching techniques for engaging large groups and are also introduced to novel instructional technologies such as “flipped classroom” videos and use of social media for teaching. The annual Division Teaching Retreat addresses cutting-edge topics in education. Past retreat topics have included teaching millennial learners, employing the Harvard Business School method for case teaching, and addressing the hidden curriculum.

Evaluation and Impact: The Teaching Workshops are rated highly by fellows on our biannual curricular evaluation surveys. Over 90% of graduates of the fellowship report they are engaged in teaching as part of their current position on post-graduate surveys.
LEARNER-CREATED SPACED EDUCATION: A PILOT STUDY

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BACKGROUND: Lectures are the principal mode of teaching in universities and medical schools throughout the world. Even in graduate medical education, a bulk of didactic material occurs in lectures at daily conferences and Grand Rounds. However, development of understanding requires active effort by learners, and most lectures don’t make learners active participants. Recent studies showed that the delivery of questions after a lecture, and repetition of these questions over time (“spaced education”), improves knowledge acquisition, boosts retention, and changes behavior (Shaw 2011). Traditionally, questions used in spaced education curricula have been created by educators. However, teaching learners to create their own questions improves thought complexity, initiative, and engagement with the material (Bowker 2010). In addition, writing question and answer sets helps the learner by taking advantage of the “generation effect,” the theory that information is better remembered if it is generated, rather than passively acquired (Slamecka 1978). The present study tested the feasibility of creating and implementing a learner-created online spaced education course based on lecture material presented in conferences in the BIDMC Rheumatology Department.

METHODS: BIDMC rheumatology fellows, nurses, and attendings were invited to join a 3-month, online course designed to review material from weekly didactic sessions. One rheumatology fellow was assigned to create 2-3 multiple choice question-and-answer sets after every lecture. Qstream software was used to send questions via email. By clicking on a link, learners answered the questions, and were presented with the correct answer and a short explanation. If questions were answered incorrectly, they were resent 1 week later; if questions were answered correctly, they were resent 2 weeks later. By answering a question correctly twice in a row, learners attained “mastery” and retired the question.

RESULTS: 12 learners enrolled in the course, including 6 rheumatology fellows, 3 nurses, and 3 attendings. 3 fellows contributed questions for the course. There were 16 multiple-choice questions, 11 from fellow-led case conferences and journal clubs, and 5 from Grand Rounds. 7 learners completed the course, answering all questions. For these learners, the percentage of questions answered correctly at first presentation was 52%. After repeated testing, 6 of the 7 learners attained “mastery” of the questions, answering 100% of questions correctly.

CONCLUSION: The present study showed the feasibility and success of a learner-created, online spaced education course to complement weekly didactic sessions in the BIDMC Rheumatology Department. Results showed the limited efficacy of lectures in enhancing learning, as evidenced by the fact that learners answered initial questions correctly only half of the time. However, through spaced education, most learners were able to learn the material and answer all of the questions correctly. Trainees involved in question-writing commented they found the experience difficult but extremely rewarding, since it motivated them to identify the central message from a lecture and to develop a deeper understanding of the material. Future studies should assess whether learner-created spaced education enhances learning, encourages creativity, and improves teaching skills.
Objective: To develop an interactive and engaging evidence-based curriculum of core cardiology topics geared towards interns and residents.

Background: The Zoll (cardiology) service at Beth Israel Deaconess Medical Center (BIDMC) is a busy, anxiety provoking and stressful rotation for interns and residents. Housestaff often find it challenging to be actively involved in decision making due to the specialty and subspecialty knowledge required. The fast turnover, high team census and daily time constraints make it difficult to incorporate teaching into daily rounding. On the general medical services at BIDMC, attending rounds occur every afternoon and provide protected time for small group learning. This previously occurred sporadically on the Zoll service until recently when Dr. Gavin, former fellow at BIDMC, made this a structured curriculum. This project is a small part of the overall curriculum and is aimed at teaching core cardiology topics in a case-based fashion.

Methods: Interns and residents were informally surveyed with two simple questions: What do you want to learn? How do you want to learn it? The topics housestaff identified included basic cardiology topics such as non-ST elevation myocardial infarction (NSTEMI), aortic stenosis, pacemakers and ICDs and practical topics such as how to interpret ECGs and telemetry, and how to choose a stress test. From this, a list of twelve core topics and learning objectives were created. For the second question, common themes were: interactive, case-based, and chalk talk. With this feedback, we set out to create a case-based curriculum of chalk talks which could be given by the cardiology fellows. Each case is based on a real case from the Zoll service and incorporates recent and landmark studies to teach an evidence-based practical approach to common cardiology topics. The fellows are provided with a facilitators guide and the housestaff are given a handout with the case.

Progress and Next Steps: The curriculum is currently in the development and testing stage; two topics (atrial fibrillation and NSTEMI) have been piloted to date. The next steps will be to gather feedback from interns and residents as we continue to develop the curriculum and write cases for the other ten topics.
LEARNING TO TEACH AMBULATORY MEDICINE: A LONGITUDINAL RESIDENT-STUDENT PATIENT CARE COLLABORATION IN PRIMARY CARE

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Problem and Study Intent
Although the majority of medical care in internal medicine occurs in the ambulatory setting, the bulk of residency training is inpatient, resulting in residents receiving little instruction in outpatient teaching skills. Today’s trainees are tomorrow’s medical educators; to ensure a skilled clinician educator workforce, medicine residency training must include instruction in ambulatory teaching skills.

Objectives
Residents will develop a foundation of ambulatory teaching skills and will be able to apply them in the moment depending on learner needs and topics addressed.

Description of Project/Intervention
At Cambridge Health Alliance (CHA), most teaching in the third year medical student clerkship (Cambridge Integrated Clerkship – CIC) is done by attending physicians; residents have little exposure to medical student teaching. CHA residents have traditionally received minimal instruction in ambulatory teaching methods. Our near-peer educational exchange pairs CIC students with PGY-2 and -3 primary care providers to collaboratively follow complex medical patients in continuity clinic and to allow residents to develop ambulatory teaching skills.

Residents participate in a series of ambulatory resident-as-teacher workshops covering skills including: setting learning goals and objectives; learning climate; precepting models such as SNAPPS and the one-minute preceptor; and giving feedback. They subsequently select appropriate collaborative patients, design learning objectives for each visit, directly observe medical students as they interview and examine patients, and provide feedback and on-the-fly teaching on ambulatory topics. Experienced faculty directly observe the residents as they precept the visit and provide frequent feedback and coaching on teaching skills.

Key Lessons Learned
After a limited pilot to assess feasibility, we have seen the project is viable despite the complex schedules involved. We have found that patient selection is of utmost importance - patients must be medically and psychosocially complex enough to require frequent visits, but not so complex that the student is overwhelmed and unable to run the visits - and we have established a set of criteria for patient selection.
RESIDENT-PERCEIVED BENEFIT OF A MUSCULOSKELETAL ULTRASOUND CURRICULUM: A MULTIFACETED APPROACH USING SELF-DIRECTED LEARNING, PEER TEACHING, AND INTERDISCIPLINARY COLLABORATION.

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ABSTRACT

Objective: Interest in musculoskeletal ultrasound (MSUS) training by physiatrists has grown as a tool to facilitate personalized point-of-care diagnostic testing and treatment. MSUS training is now a required component of physiatry residency training, but formal curriculum guidelines are not yet established. Our objective was to assess the educational value of a MSUS training program which utilized interdepartmental collaboration, self-directed learning, and peer teaching.

Design: Cross-sectional study.
Setting: Physical medicine and rehabilitation residency training program.
Participants: 23 resident physiatrists and faculty in PM&R and rheumatology.

Interventions: Residents participated in a nine month MSUS curriculum. Every 3 months, a 4 hour long hands-on MSUS training session was led by a PM&R faculty MSUS expert. Each session focused on 1-2 body areas with corresponding assigned reading. Prior to each session, 5-6 resident volunteers were trained by the faculty as resident instructors who taught their peers in small group MSUS training sessions (1:3 ratio). Upon session completion, residents practiced with peers and produced standardized images for review by the resident instructor and faculty. Concurrently, residents rotated with PM&R and rheumatology MSUS faculty performing both point-of-care diagnostic MSUS examinations and MSUS-guided procedures under direct supervision.

Main outcome measures: Likert scale-formatted questionnaire to assess resident-perceived value of a new MUS curriculum.

Results: Of the 23 residents, 22 responded (96%). Resident knowledge of MSUS prior to the first teaching session was very little, with 91% of residents reporting no or some knowledge of the modality (Likert mean 1.7 +/- 0.6) There was a significant improvement in self-reported MSUS knowledge after curriculum implementation (p=0.001). Peer teaching was highly valued, with 86% of residents rating it “very” to “extremely” beneficial (3.9 +/- 1.1). Self-guided learning, by supplemental scanning and reading, was rated beneficial or very beneficial by 73% of residents. Overall curriculum rating was good to excellent for 70% of residents (4 +/- 0.8). Training by rheumatology faculty was found to be “very” to “extremely” beneficial by 83% of residents.

Conclusion: A collaborative MSUS program was beneficial in the education of physiatry residents. Our pilot program can serve as a teaching model for other physiatry residency programs introducing required teaching of MSUS.
HARVARD MEDICAL SCHOOL CLERKSHIP AT SPAULDING REHABILITATION HOSPITAL

Authors: Jennifer Luz MD, Jennifer Earle MD, Uvieoghene Ughwanogho MD, Lindsay Ramey MD, Shirley Shih MD, Kevin O’Connor MD, Ross Zafonte MD, David Crandell MD

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Introduction: Physical Medicine and Rehabilitation (PM&R) physicians provide care for people with a wide range of physical disabilities and musculoskeletal disorders. PM&R is becoming a more sought-after residency; however, most medical schools do not offer a class and/or a formal rotation in a PM&R setting. This four-week introductory clerkship, an elective rotation through Harvard Medical School, provides exposure to the scope of services PM&R physicians provide.

Course Description: The first two weeks are spent on an inpatient service (spinal cord injury, brain injury, stroke, pediatrics or musculoskeletal service), and the following two weeks in outpatient clinics. Clinics include spine and pain management, musculoskeletal/sports, pediatrics, spasticity management, and electrodiagnostics. The assignment to inpatient and clinic schedules incorporates any preexisting student interests if identified beforehand. On the inpatient service, students follow 3-4 patients through all aspects of rehabilitation, including physical, occupational, speech, and recreational therapies. In the outpatient setting, students participate in guided patient evaluations and observe interventional management procedures. A required 30-minute oral case presentation is based upon the patient closely followed during the inpatient experience.

Resident Involvement: Two senior residents (JL, JE) have adapted the current curriculum. Our goals were to establish clear rotation objectives, a variety of exposure to both inpatient and outpatient services, improved feedback for both clinical performance and final case presentations, and most importantly, student mentorship. The senior residents implemented offering motivated medical students guidance in submitting their final case presentations at national academic meetings. Three junior residents (UU, LR, SS) have joined the committee and are working to improve student mentorship with guidance through the application process to PM&R. The resident facilitators for the clerkship provide students with the month’s schedule, clerkship objectives, and recommended readings via e-mail prior to the start of the clerkship. They, along with the course director, then meet with students throughout the clerkship to provide teaching and to give and receive feedback. Residents, fellows, and attendings provide small group interactive didactics, clinical guidance and supervision, exposure to patient encounters, and daily feedback regarding clinical and presentation skills. Didactics cover history-taking and physical examination, condition-specific medical treatments, and disability ethics and social medicine. Our primary endeavors, to educate medical students on the importance of a rehabilitation perspective of clinical care; to encourage motivated students to consider the field of PM&R as their future career; and to guide them through the application process, have been successfully met based on positive student feedback questionnaires.
Neurology residents as proficient teachers - Teaching skills workshop

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Teaching skills training for neurology residents should be based on the premise that residents are interested in teaching and are experienced interpersonal communicators. Brief but well-designed interventions will likely lead to better neurology teachers and student learning outcomes. While the Partners Neurology Residency Program has many formal teaching opportunities for residents, no specific training program has been created before. The ultimate goal of the proposed workshop is to develop a highly significant educational intervention to encourage more and better resident teaching by rising senior residents. The workshop modules and content are shown on the table.

<table>
<thead>
<tr>
<th>Module</th>
<th>General principles of teaching and specific aspects of teaching neurology</th>
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<td>Content:</td>
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  - Identifying student’s knowledge and experience in neurology  
  - Role-modeling self-directed learning  
  - Engaging and motivating learners  
  - Setting realistic and attainable learning expectations  
  - Effective use of questioning during teaching  
  - Applying learning to broader clinical problems  
  - Reinforcing prior learning and continued self-improvement | 1. Interactive lecture and role modeling: 30 min  
  2. Video interview of most accomplished neurology teachers: 5 min  
  3. Small-group discussion: 20 minutes |

| Module 2 | The Bedside Neurology Teaching |
| Content: | 
  - Setting an stage for a bedside teaching encounter,  
  - Tips to improve bedside teaching  
  - Neurology bedside teaching (complex history-taking, basic and advanced neuro physical examination, developing empathy, promotion of patient participation, neuro-localization).  
  - The challenges to neurology bedside teaching (simulation difficult situations) | 1. Patient-centered teaching scenarios: 30 min  
  2. Video interview of most accomplished neurology teachers: 10 min  
  3. Small-group discussion: 20 min |

| Module 3 | Giving Effective Feedback |
| Content: | 
  - Principles of formative feedback as an essential component of assessment and improvement  
  - How to engage medical students in self-reflection on own neurology knowledge  
  - Managing student over-confidence and lack of clinical knowledge  
  - The benefits and challenges of various methods of feedback delivery | 1. Interactive lecture and role modeling: 40 min  
  2. Video interview of most accomplished neurology teachers: 10 min  
  3. Questions: 10 min |

<p>| Module 4 | Classroom teaching and effective course organization |</p>
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<thead>
<tr>
<th>Content:</th>
<th>1. Interactive lecture and role modeling: 55min</th>
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<tr>
<td>• How to prepare cases for morning report</td>
<td>2. Questions and answers: 5 min</td>
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<td>• Peer-teaching conference: The neurology straight talks</td>
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<td>• Presenting an article at journal club</td>
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<td>• Neuroradiology and neuropathology sessions</td>
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<td>• Drafting outlines and lecture-style deliveries.</td>
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<td>• Effective power point presentations</td>
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<td>• Basic techniques of neurologic video/photo production and editing</td>
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Background: Clinical fellows in Internal Medicine subspecialties can have a major educational impact on students and residents. A recent focus group analysis of local residents and fellows identified several potential barriers to a positive teaching interaction, including both systematic and personal obstacles. One modifiable domain identified in this study related directly to fellow teaching skills, including the ability to provide a positive environment, engage residents, and deliver effective teaching. The purpose of this project was to evaluate fellows’ attitudes towards teaching and determine the amount of teacher-training provided during fellowship.

Methods: A survey tool was designed and edited in an iterative fashion to optimize content. The tool was pilot tested with current fellows and recent graduates. Subspecialty fellows at three Harvard Medical School-affiliated hospitals were anonymously surveyed.

Results: One hundred seventy-six fellows from nine subspecialties responded to the survey. Eighty-four percent of subjects plan to participate in teaching in their future careers, and 23% plan to participate in medical education scholarship. While the majority of fellows (67%) reported having training related to teaching skills in residency, only 32% received such training during fellowship. Twenty-nine percent have had their teaching observed for the purpose of feedback. Ninety-five percent of fellows feel that teaching residents is the responsibility of a fellow. Ninety-three percent of respondents feel their teaching skills can be improved, and 75% are interested in further training on this subject.

Conclusion: The majority of subspecialty medicine fellows at Harvard hospitals are interested in improving their teaching skills. However, most fellows do not receive such training during fellowship. These results will inform the development of a novel curriculum (FACT) aimed at improving fellows’ teaching skills. Such a program may enhance resident and student learning, as well as improve teaching skills of future faculty.
Internal medicine residents are less comfortable caring for patients with childhood-onset chronic diseases than their pediatric counterparts. Conversely, pediatricians are increasingly exposed to conditions encountered more frequently in adult patients, including venous thromboembolism, hyperglycemic hyperosmolar state, and pancreatitis.

We developed the Med-Peds Crossover Curriculum to address these gaps in comfort, knowledge, and exposure. Initiated in 2011, this monthly Curriculum is case-based. A medicine-pediatrics resident presents a case to categorical housestaff and a faculty discussant with expertise in the disease state illustrated by the presentation. For cases presented to the internal medicine residents, a pediatrician or pediatric subspecialist serves as the faculty discussant. Conversely, for cases presented to pediatrics housestaff, an internist or internal medicine subspecialist provides his/her expertise.

Over the prior academic year, we presented cases illustrating the use of extracorporeal membrane oxygenation (ECMO) in a 15-year-old male with influenza and methicillin-resistant *Staphylococcus aureus* (MRSA) pneumonia; respiratory syncytial virus (RSV) infection in a 61-year-old male with hypertrophic cardiomyopathy admitted to the cardiac intensive care unit; and, the management of a vaso-occlusive episode in an 18-year-old boy with sickle cell disease to internal medicine residents. To pediatrics residents, we have presented cases concerning the management of pancreatitis in an 18-year-old girl with hypertriglyceridemia; venous thromboembolism in a 14-year-old boy admitted with hyperglycemic hyperosmolar state; and, acute HIV infection in a 15-year-old young man who has sex with men.

Internal medicine residents reported that hearing from pediatric master educators enhanced their learning and that these cases added to their overall education. Qualitative data indicates that internal medicine residents intend to incorporate what they’ve learned into their practice. Moreover, the Curriculum has influenced hospital-wide policies on the care of pediatric patients with pancreatitis and has contributed to ongoing development of guidelines for pediatric venous thromboembolism prophylaxis.

Thus, the Crossover Curriculum capitalizes on the burgeoning expertise and unique insights of medicine-pediatrics residents. It also enriches the existing curricular activities of the categorical programs and provides a clear, consistent presence of the medicine-pediatrics residency program. The Crossover Curriculum is currently being adopted by other medicine-pediatrics residency programs and, most importantly, encourages critical evaluation of clinical practices within affiliated categorical programs.
THE FELLOW AS CLINICAL TEACHER CURRICULUM (FACT): MAXIMIZING TEACHING AND LEARNING ON THE WARDS

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Background

The interaction between residents and clinical fellows in the setting of a consult offers a potentially unique, efficient, and effective context for resident learning. However, a recent study conducted by our group demonstrated that the resident-fellow teaching interaction on the general medicine wards faces substantial barriers, including attitudes and perceptions of both residents and fellows, hospital systems-related factors and skill-based factors. Improving fellow teaching skills was identified as an important potential intervention to enhance the resident-fellow interaction. In addition, a survey of Internal Medicine subspecialty fellows at Harvard-affiliated hospitals demonstrated that most fellows are interested in programs aimed at improving their teaching skills. We developed the Fellow as Clinical Teacher (FACT) curriculum to improve fellows’ teaching skills and enhance the resident-fellow teaching interaction.

Curriculum Description

The FACT curriculum is composed of two interactive workshops and direct observation and feedback experiences. The workshops focus on adult learning theory, methods of breaking down the barriers to the resident-fellow teaching interaction and teaching within the consultation (including use of the PARTNER model, a structured approach to teaching within a consult interaction developed by our group). After participating in the workshops, fellows will have the opportunity to be observed by selected faculty during consult interactions with housestaff and receive structured feedback throughout the academic year.

Curriculum Implementation and Evaluation

We plan to pilot the FACT curriculum during the 2014-2015 academic year in three fellowship programs (MGH Rheumatology, BWH Rheumatology and MGH/BIDMC Pulmonary/Critical Care). Fellows will be evaluated via the Objective Structured Teaching Exercise (OSTE) and a self-assessment survey instrument prior to starting the curriculum, following the completion of the workshops, and again at the end of the academic year.

Conclusion

The consult interface presents an important educational opportunity for residents, however the resident-fellow teaching interaction faces a number of barriers. Improving fellow teaching skills may enhance the resident-fellow teaching dyad and improve resident learning on the wards. Our pilot study aims to investigate the impact of the FACT curriculum on fellow teaching skills within the consult interaction.
THE RESIDENT-FELLOW INTERACTION: LIMITING THE BARRIERS AND MAXIMIZING LEARNING

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Background
Subspecialty consultation represents a powerful opportunity for resident learning. However, many barriers may limit the educational exchange between fellows and residents because they work on different teams and face different work pressures and incentives. To our knowledge no study has previously examined the teaching interaction between fellows and residents. We conducted a focus group study to determine the barriers and facilitating factors to the resident-fellow interaction on the medicine wards.

Methods
32 residents and fellows representing all residency classes and 7 IM subspecialties participated in four focus groups. Themes were analyzed using the Framework approach.

Results
Residents and fellows identified “teaching” as a broad range of interactions, ranging from “chalk-talks” to the team, to explaining the reason for recommendations to a resident. All fellows and residents expressed a strong interest in engaging in teaching interactions.

Two major domains of barriers and facilitating factors to an effective teaching interaction were identified: 1) personal and 2) system-based.

Within the personal domain, participants identified the degree of pushback on the part of fellows, willingness to engage in a teaching interaction on the part of both residents and fellows, and perceptions/expectations of residents and fellows about each other, which may at times be erroneous, as major factors influencing the teaching interaction.

Within the systems domain, participants identified the process of initiating the consult, quality of the initial consult request, resident/fellow workload and experience, resident team structure, familiarity between residents and fellows, the culture of the subspecialty division and fellow teaching skills as important factors.

Both positive and negative feedback loops appear to play an important role in the resident-fellow interaction, with positive interactions strengthening future interactions.

There was broad agreement between fellows from different subspecialties and residents of all 3 classes with respect to both barrier and facilitating factors.

Conclusion
The resident-fellow interaction faces multiple barriers from both systems and personal domains, however many of these barriers may be modifiable. Future efforts should focus on implementing strategies to address these barriers. Such programs can help our fellows be better teachers and enhance resident learning.
TEACHING IN THE SETTING OF A CONSULTATION: THE “PARTNER” MODEL

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Background
Fellows can serve as a tremendous educational resource for residents, particularly in their role as consultants. However, teaching in the setting of a consultation can be challenging due to time constraints and lack of a longitudinal relationship between the resident and fellow. We developed the PARTNER model in order to provide fellows with a structured approach to teaching residents during a consultation.

Model Description
The PARTNER model is designed for the teaching interaction between a resident and fellow that takes place after the fellow has seen the patient and is ready to provide recommendations.

Partner with resident – Create a mini-learning contract. Setting time limits (often interaction will be limited to 3-5 minutes) and making it clear that a portion of the discussion will be devoted to teaching is important in order to set appropriate expectations for the interaction.

Assess the learner – Understand the resident’s learning needs in order to determine the most relevant teaching points. Ask higher-order questions (beyond simple recall) to probe the learner’s ability to synthesize information.

Reinforce positives – Provide brief feedback on the learner’s knowledge base from the assessment phase. Reinforce correct knowledge and synthesis of information.

Teaching objectives – Determine teaching objectives for the next phase while taking into account the time available for teaching. Explicitly state the teaching objectives.

New knowledge – Communicate teaching points. Focus on teaching the approach to the patient and general concepts, rather than esoteric details when possible.

Explain recommendations – Clearly communicate consult recommendations.

Review – Allow time for the resident to ask questions and clarify consult recommendations. Plan discussion for the following day.

Conclusion
The PARTNER model offers fellows a time-efficient structure to engage residents in active learning during the consult interaction using a learner-centered approach.
Designing and Evaluating a Workshop to Prepare Medicine-Pediatric Interns for Supervisory and Leadership Roles

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Objectives: To develop and evaluate a curriculum to prepare Medicine-Pediatrics (Med-Peds) interns for second-year supervisory and leadership responsibilities.

Methods: We surveyed 81 US Med-Peds Residencies’ Program Directors (PDs), Associate and Assistant Program Directors (APDs), interns and second-year residents regarding perceived need for targeted curriculum to prepare Med-Peds interns for second-year supervisory and leadership responsibilities and the topics they considered important to include in such a workshop. An interactive, case-based workshop was designed based on those results. Interns from 2 Med-Peds residencies (n=8) attended pilot workshops at their host institution at the end of their intern year. They completed sequential email surveys before the workshop, 1 week after, following their first team-leading month, and at the end of their second year of training, rating their confidence in selected skills, knowledge of key resources, and overall feelings of preparedness for second year. A paired t-test was used to measure change.

Results: Med-Peds PDs/APDs and interns and second-year residents all identified a need for a Med-Peds specific curriculum to prepare Med-Peds interns for second-year supervisory and leadership responsibilities. Comparing results of interns/residents and PDs/APDs showed some similarities in topics ranked as high priority to include in the workshop, but some differences were present as well. Post-intervention surveys revealed that all interns (n=8) reported that the workshop decreased anxiety related to transitioning to second year of residency and would recommend it to future interns. Self-reported confidence in several key team-leading skills improved and most residents reported that the workshop led to specific behavioral change such as how to organize their day or run rounds.

Conclusions: A national needs assessment can be used to identify gaps in intern training and to create targeted curricula. Our interactive workshop decreased anxiety regarding transition to second-year supervisory and leadership responsibilities and improved confidence in important resident skills.
CAREERS AND CLINICAL CASES IN DERMATOLOGY: ENGAGING RESIDENTS IN A SECOND-YEAR MEDICAL STUDENT DERMATOLOGY CURRICULUM

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Dermatology is a broad field with several clinical, research, and public health areas of importance. Current medical school curricula provide varying amounts of exposure and training in dermatology for medical students. Graduate medical training in dermatology stresses several competencies, including communication skills and professionalism.

We designed a pilot intervention to increase medical student knowledge about the breadth of dermatologic careers and clinical conditions. All students at Harvard Medical School were invited to participate. Beginning the fall of 2012, we conducted three hour-long multimedia sessions led by Dermatology residents during the dermatology block in the HMS curriculum. The sessions focused on: (1) training and careers in dermatology; (2) pediatric dermatology; and (3) challenging inpatient consults. Besides increasing medical student awareness, the sessions emphasized resident communication and professionalism.

Over 50 students participated. Feedback was obtained through post-session questionnaires and via course surveys from HMS; content was praised by students. Resident feedback was also obtained. Faculty observed select sessions to provide teaching critiques. Respondent feedback will be used to enhance the sessions for both students and residents. The series was again conducted in the fall of 2013 incorporating student feedback from the prior year, with similar success and plans are underway to repeat the sessions in 2014.

Engaging residents in the formal delivery of content for medical students represents a mechanism for stimulating interest in the next generation of physicians and cultivating critical competencies among current trainees.
BIDMC RESIDENT-AS-TEACHER MULTIDISCIPLINARY DVD SERIES CURRICULUM

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Background and Purpose
The medical education literature shows that residents spend at least 25% of their time teaching, enjoy teaching, consider it important, and agree that teaching improves their clinical knowledge and skills. In turn, medical students consider resident teaching a significant factor in their education and believe that residents are important role models in their development as physicians. Unfortunately, in today’s busy clinical environment, there is limited time to formally train residents as teachers. To confront this challenge, we developed a multidisciplinary curriculum that includes a DVD series and accompanying facilitator guide and self-study program. The intent of the curriculum is to help program directors, medical educators, and residents implement and/or engage in a resident-as-teacher program. The curriculum covers 6 essential topics: Application of Adult Learning Theory, Clinical Teaching Skills, Clinical Supervision, Providing Effective Feedback, Small Group Discussion, and Teaching Procedural Skills. To emphasize the universal application of these topics, we filmed senior clinician educators from different clinical departments as they discussed and reflected upon a selected topic and then demonstrated its best use. The curriculum will be distributed hospital-wide and may be presented as a self-study program, as the basis of a facilitator-led teaching series, or as preparatory material for a “flipped” classroom-type session. We plan to study the impact of the curriculum on the PGYII residents’ teaching skills.

Goals
The curricular goals are to: introduce residents across clinical departments to the knowledge, skills, and behaviors associated with best teaching practices; encourage application of adult learning principles in varied clinical settings; and develop residents’ confidence in clinical teaching, supervising learners, providing feedback, leading discussion sessions, and teaching procedural skills.

Methods
The BIDMC Resident-as-Teacher Committee determined the curriculum’s content, format, and assessment methods. A literature search, as well as discussions with senior medical educators, informed development of the curricular goals, teaching material, and presentation strategies. Individual committee members were filmed for 9 minutes answering pre-scripted questions in which they shared their experiences and insights about one of the teaching strategies. They were also filmed using the strategy in an actual hospital venue to demonstrate best teaching practices. The authors wrote an instructional overview, facilitator’s guide, self-study guide, and pocket guide to accompany the DVD modules. They also created assessment instruments and pilot-tested the curriculum through self-study and small group teaching modalities.

Results
All 14 individuals who pilot-tested and assessed the quality of the curriculum found it to be “Quite” or “Extremely Useful” in terms of introducing the skills of clinical teaching, and 100% found the overall quality of the series to be “Excellent.” Written feedback was extremely positive, highlighting aspects of the curriculum, such as: “Great resource – well organized, high yield content, concise in a format that provides a lot of flexibility for instruction.” In addition, feedback was offered suggesting alternative usage: “You designed this series for residents. In many ways, I think it would be as useful for young attendings as well.”
Conclusion
Creating a multimedia, multidisciplinary curriculum is a resource- and time-intensive process; however, this is a worthy investment to promote teaching excellence among residents and to enhance trainees’ and medical students’ educational experiences in academic medical centers.
DEVELOPING RESIDENTS INTO REFLECTIVE TEACHERS—A RESIDENT AS TEACHER WORKSHOP FOR INTERNAL MEDICINE RESIDENTS

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The Cambridge Health Alliance trains 24 internal medicine residents in an academic community hospital setting. The lack of medicine subspecialty fellowship programs increases our residents’ responsibility for teaching students and each other. In addition to most informal teaching on clinical wards, residents teach 1/3 of formal teaching conferences.

To prepare our residents for teaching and managerial responsibilities expected of junior and senior residents, we conduct a resident-as-teacher (RAT) workshop in 10 1-hour sessions during summer months in lieu of Department of Medicine Grand Rounds, to minimize time away from supervising new interns.

Curriculum for RAT workshop is set collaboratively. We anticipate some sessions that are needed every year, such as “Welcome to Senior Residency” and “Setting goals and expectations with your team” for the first 2 sessions. Remaining sessions are informed by self-identified learning objectives (elicited in the 2nd session) regarding their various roles as teachers, managers and leaders.

Topics for RAT sessions are role- and responsibility-based, e.g., “planning your journal club” or “balancing autonomy and supervision” or “teaching medical students on wards” or “setting goals and expectations with your team.” Instruction methods emphasize skill building by using active learning techniques for small group setting. There is also deliberate use of different stages of learners in our one-room schoolhouse.

Learners evaluate each session for its content and effectiveness. This year we have also introduced a new evaluation question that prompts the learner to identify one teaching technique that was effective in the teaching session. We ensure exposure to variety of teaching styles and techniques by inviting different master teachers and using different learning activities. Our intent is to cultivate habits of reflecting on the process along with the content in every teaching session to maximize one’s learning.

Self-referential learning is emphasized throughout the workshop series. For example, one of the later sessions recalls the techniques observed during the series, and returns to the personal learning goals identified in the initial session. This instructional method in itself models goal setting and follow-up.

Resident attendance and participation have been excellent and they have uniformly rated individual sessions and the overall workshop series as excellent.
Moving Feedback Forward: A focus group study exploring residents’ opinions on feedback

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Background: Performance-based feedback, an important element in the professional growth of clinical trainees, reinforces positive behaviors and identifies areas for improvement. Many residents report that their supervising faculty do not provide adequate feedback, and feedback provided is often vague and non-specific. We aimed to explore our resident opinions on feedback; examine the frequency and quality of feedback provided by department faculty; and obtain perspectives on effective and ineffective feedback strategies.

Methodology: Using focus group methodology, we explored resident perceptions of feedback in general and the state of feedback in our Department of Medicine. Two focus group discussions were held (December 2013 and January 2014), comprising 10-20 residents each and representing all postgraduate years. Sessions were audiotaped, transcribed, and analyzed using qualitative methods.

Results: Residents shared their insights on the benefits of feedback, challenges in giving and receiving feedback and best practices for effective feedback. Emergent themes included: (1) feedback is not synonymous with criticism (2) even outstanding residents benefit from feedback; (3) feedback is most effective with incorporation of resident goals; (4) feedback should lead to action plans; and (5) skills training could enhance the quality of faculty and peer feedback. Residents also described feedback techniques best avoided.

Conclusions: Feedback incorporating trainee goals, emphasizing clinical performance and facilitating action plans is most likely to lead to validation of residents’ strengths and remediation of weaknesses. Specific skills development and emphasis on fostering a favorable learning environment will promote a culture conducive to giving and accepting feedback.

Table 2: Key Barriers to Providing Effective Feedback

<table>
<thead>
<tr>
<th>Category</th>
<th>Barrier</th>
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<tbody>
<tr>
<td>Learner-related</td>
<td>Learners not explicitly stating educational goals</td>
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<td></td>
<td>Hesitation to initiate feedback conversations</td>
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<td></td>
<td>Assumption that feedback discussions involve mostly criticism of shortcomings</td>
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<td></td>
<td>Vague discussions that do not address specific areas of interest to learners</td>
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<td></td>
<td>Reluctance to give feedback to senior peers and faculty</td>
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<tr>
<td>Teacher-related</td>
<td>Lack of overt interest in providing feedback (going through the motions)</td>
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<td></td>
<td>Lack of direct observation of learners’ performance</td>
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<td></td>
<td>Vague, non-specific feedback conversations</td>
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<td></td>
<td>Lack of skills in providing specific feedback</td>
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<td></td>
<td>No encouragement or guidance in developing performance improvement plans</td>
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<td></td>
<td>Feedback often provided too late to change behavior and track the change</td>
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<td>Perceived reluctance to engage in reciprocal feedback</td>
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<tr>
<td>Institutional- or environment-related</td>
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<tr>
<td>Time constraints on busy services with numerous clinical responsibilities</td>
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<tr>
<td>Inadequate resident and faculty training in structuring feedback conversations and delivering helpful feedback</td>
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<tr>
<td>Concern that honest feedback will negatively impact reputation among program directors</td>
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<tr>
<td>“Culture of niceness” where residents and faculty hesitate to give negative feedback</td>
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Figure 1. A model for effective feedback in professional development

- **Learning Climate**
  - Culture of growth and improvement
  - Openness to reciprocal discussion
  - Safe environment for addressing goals and concerns

- **Goal-setting**
  - Individualized identification of areas for desired growth
  - Expectation of observation and feedback in these areas
  - Calibration and adjustment over time

- **Feedback**
  - Mutual reinforcement of longitudinal goals
  - Learner self-reflection
  - Development of specific action plans

- **Observation**
  - Opportunities for focused, learner-directed development
  - Specific, timely debriefing
A RESIDENT AS TEACHER PROGRAM EMBEDDED IN A HIGH-FIDELITY SIMULATION CURRICULUM IN INTERNAL MEDICINE

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The optimal format of resident-as-teacher (RaT) programs remains in question. High-fidelity medical simulation may enhance RaT programs because it allows for a controlled and reproducible teaching environment, providing an important opportunity for feedback and reflective practice of teaching skills.

We designed and conducted a unique RaT program for upper-level residents who serve as facilitators in an existing simulation curriculum for Internal Medicine (IM) interns. Residents (n=41) who facilitated the eight-case curriculum for interns (n=52) were offered a workshop and subsequent direct observation and feedback from faculty and senior simulation leaders. In the workshop, video examples and role play were used to present and practice five stages of debriefing: (1) elicit emotional response from learners, (2) determine and outline objectives of the debriefing session, (3) analyze the learners’ approach to the case, (4) address knowledge gaps and incorrect assumptions, and (5) summarize key takeaway points. Throughout, an emphasis was placed on creating an engaging and respectful atmosphere, facilitating a learner-centered discussion, and providing effective feedback. The training also addressed logistical challenges in teaching through simulation, such as improving simulation fidelity, optimizing the use of the mannequin and “nurse” role, and directing a fluid case progression. Throughout the subsequent intern curriculum, resident facilitators were observed during actual debriefings by faculty and received structured feedback.

The program was evaluated with pre- and post-curriculum surveys of resident facilitators, as well as intern ratings of individual facilitators and the overall simulation program. Eighty-three percent of resident-facilitators completed the pre- and post-program assessments. Participation in the RaT program led to perceived improvements in resident facilitators’ feedback skills (53% improved moderately or greatly), teaching skills in a simulated environment (89% improved moderately or greatly), and their ability to teach on the wards (50% improved moderately or greatly). Thirty-eight interns (73%) completed the program evaluation, and 166 intern ratings of resident facilitator efficacy were collected. Interns rated the program and facilitator efficacy highly.

Our RaT program using high-fidelity simulation improved self-assessed resident teaching and feedback skills. A unique aspect of the program is the opportunity for deliberate practice of teaching in a reproducible setting. Our program design may serve as a model for the development of future RaT programs using simulation to improve intern learning and resident teaching skills.
IMMERSIVE TWO-WEEK RESIDENTS-AS-TEACHERS CURRICULUM FOR INTERNAL MEDICINE RESIDENTS

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The important role of resident physicians in medical education is well-recognized, and numerous resident-as-teacher (RAT) programs have been developed to provide appropriate training. However, most interventions are one-time events limited to several hours, leaving uncertainty regarding long-term efficacy and an unmet need for those interested in careers in teaching and education. To address this need at Massachusetts General Hospital, we designed and implemented an immersive two-week RAT elective for internal medicine residents.

First offered in May 2014, the course encompasses not only multiple faculty-led didactic sessions, seminars, and workshops, but also several formal teaching opportunities, peer and faculty observation, and self-reflection exercises. Topics of didactic sessions include adult learning theory, setting expectations, and evaluation/feedback. The workshop series allows reflection and practice surrounding various settings of teaching medicine: on rounds, in clinic, at the bedside, during procedures, in small groups, and in lectures. All participants also apply new skills by individually preparing for and leading at least three formal educational sessions, such as noon conference, resident report, medical simulation, and case-based or didactic small group sessions. A peer and/or faculty member observes each of these instances and provided robust, prompt feedback. When possible, residents’ teaching sessions are also video-recorded for self-review. Finally, the curriculum includes topics that are not traditional components of RAT courses, using seminars and workshops on curriculum development, coaching and mentorship, medical education research, role modeling, the process of peer observation of teaching, and careers in medical education.

A total of twelve interns and residents completed the first offering of the course, and an additional thirty-three residents registered for the next two iterations scheduled in 2014-2015. Participants and non-randomized matched controls enrolled in a mixed-methods study to assess the efficacy of the course. Preliminary review of survey and reflective writing data from the participants is highly encouraging. Ninety percent of course participants (all of whom responded to the post-course survey) gave highest marks on Likert questions regarding the course’s rigor and provision of relevant content and skills. All respondents stated they would “very strongly recommend” the course to other residents. Most individual sessions received similarly high marks. Reflective writing by the participants revealed high levels of self-analysis and goal setting.

This novel, intensive, and comprehensive course emphasizes deliberate practice of skills and aims to train residents to better fulfill present and future teaching roles. The study of the course’s efficacy will continue with six-month follow-up surveys, further analysis of qualitative data, and enrollment of future course participants.
The predominant medical school paradigm features an anatomy course in the first year, including cadaveric dissection. Pelvic anatomy taught in the preclinical years can result in knowledge without clinical context and involves an emphasis on simple identification of structures, resulting in poor knowledge retention by the clinical years. Students who have matched in obstetrics and gynecology (OBGYN) residencies recognize the need for review of pelvic anatomy, as clinical experiences demonstrate that awareness of spatial relationships between pelvic structures is crucial for surgeons. Pelvic anatomy is currently not taught in a rigorous fashion in the fourth year electives available to Harvard Medical School (HMS) students. To address this unmet need we designed and implemented a hands-on curriculum for reviewing pelvic anatomy for students entering an OBGYN residency program.

Eight medical students at HMS participated in an intensive two day pelvic anatomy workshop during a fourth year elective in OBGYN. Students received online reference resources for review prior to a formal didactic session. Students were provided the raw materials necessary to “construct” a pelvis. Using a plastic model of the bony pelvis, students completed a self-guided “constructive” anatomical exercise that asked the learner to translate standard text and graphics into construction of a complete pelvis, from bone to viscera. Instructors were available for assistance throughout the session. The constructed model, using modeling clay to create the muscular anatomy, various sheer textiles to simulate ligamentous and membranous structures, as well as colored pipe cleaners to represent vasculature and innervation, provides a 3-dimensional representation of a female pelvis. In a post-exercise evaluation, students found this exercise useful and felt it helped in preparing them for their upcoming residency training. 100% of students strongly agreed the exercise was relative to their education. In addition, the knowledge gained from this workshop achieves level one status of the American College Graduate Medical Education OBGYN Milestones Project.

We propose this practical curriculum as a low cost, high yield alternative to costly cadaveric dissection, providing a practical understanding of female pelvic anatomy and spatial structural relationships needed for the obstetrical and gynecologic surgeon.
Over the last decade, Emergency Ultrasound (EUS) has been established as a point-of-care diagnostic tool and is now recognized to be essential by many Emergency Department (ED) practitioners. With EUS, ED physicians can diagnose pathology and start patients' management expeditiously. Moreover, ultrasound (US) guided procedures and imaging acquisition have become standard of care, and the ACGME has established strict guidelines for EM residency programs for performing and interpreting US studies. Thus, EUS curriculums have been incorporated into residency and medical student training programs nationally to provide young physicians with the basics of bedside sonography. A number of EUS fellowships have been established in the United States. The program at Beth Israel Deaconess Medical Center (BIDMC) was brought to life less than a year ago and has already tremendously impacted medical education. Our fellows assume a leadership role in teaching medical students and residents.

At BIDMC, an US simulation curriculum has been developed for medical students as part of their EM clinical rotation. During these “Sim” Sessions, students learn the basic vocabulary of ultrasonography and practice skills on models, so they can later use these skills on patients. Students learn techniques such the Focused Assessment with Sonography in Trauma (FAST) exam, basic cardiac ultrasound and how to place ultrasound-guided central lines. All BIDMC US fellows facilitate these monthly activities. In addition, as part of our new curriculum, medical students are given an array of educational opportunities such as attending weekly US lectures and Quality&Assurance (Q&A) meetings where the most exciting cases of the week are reviewed, and we discuss the latest pertinent research literature. Students are also encouraged to participate in daily bedside US teaching led by a designated fellow.

Our BIDMC US fellows also provide one-on-one teaching for EM residents. Each intern has a one-month total US rotation and is assigned to a fellow as a mentor. As a mentor, the fellow designs a specialized curriculum that fits the need of that intern and provides daily educational sessions in ED. Fellows offer prompt feedback through live sessions, Q&A weekly meetings and evaluation of each recorded US study. In addition, senior EM residents may opt for a week of US education to learn advanced skills as part of an elective rotation.

Our EUS fellowship not only offers an invaluable academic growth opportunity for each fellow, but also allows fellows to make a real difference and impact the quality of medical education for medical students and residents within the Harvard affiliated medical teaching community.
REACHING OUT AND SPEAKING UP: RADIOLOGY RESIDENTS EDUCATING THE COMMUNITY

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ABSTRACT
Low visibility of Radiologists in the community has lead to a public misperception of the role Radiologists play in the health care of Americans. As part of its initial "Face of Radiology" campaign research, the American College of Radiology found that respondents in the general public and on Capitol Hill were largely unaware that Radiologists were licensed physicians with extensive training in medical imaging. In addition, patients may be unaware of what to expect when undergoing a particular imaging examination or in understanding the need for such an examination.

Responding to the need for greater public understanding of a Radiologist's role and to familiarize the community with various imaging studies, the Brigham and Women's Hospital Radiology Residency Program has designed and is implementing a Community Speakers Bureau comprised of residents discussing various topics in Radiology with community groups. Examples include a discussion/video demonstration of the experience a patient should expect when undergoing an MRI or CT examination, the reality of radiation risks in CT studies, and discussions of some of the more common and/or controversial examinations such as cancer screening through mammography and CT colonography. Providing education in anatomy, imaging, and radiation safety to affiliated health professionals such as Radiology Assistants and Physician’s Assistants is also included. Each topic is selected for its relevance to the particular community or educational group, which include retirement communities, religious, academic and school groups. Surveys before and after the presentations allow efficacy to be monitored.

Goals of the program include: (1) Introduction of the Radiologist as a physician specialized in medical imaging. (2) Educating participants on important health care topics and providing dedicated education in anatomy and imaging for health care workers in their training. (3) Dispelling myths and addressing concerns related to common radiological procedures. (4) Educating patients on the importance of diagnostic and screening studies for improving health outcomes. (5) Improving Radiology resident's public speaking and communication skills.

In summary, an organized residency speakers bureau with an outreach component can be effective in disseminating educational material on health topics related to Radiology while providing a framework for Residents as Teachers in Radiology and the community.
WEEKLY EMAILED TEACHING TIPS AND ARTICLES IMPROVE TEACHING AMONG GENERAL SURGERY RESIDENTS


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Objectives
Teaching is a major responsibility of surgical residents and is critical in the education of co-residents and medical students. The majority of surgical residents lack formal education on being an effective teacher. We examined the effect of weekly teaching tips and resident-teaching related articles on resident perceptions of their teaching role.

Methods
The medical education literature was reviewed for articles on resident teaching. Articles with the following themes were identified by our institution’s resident education panel: mentorship and role modeling, teaching methods, adult learning theory, feedback, and the resident role of teaching. Ten high yield articles and 10 teaching tips addressing these themes were drawn from the initial literature search. Articles and teaching tips were then distributed to the general surgery house staff by email on a weekly basis. Surveys on resident perception of teaching roles were distributed to the surgical house staff prior to implementing the weekly emails and after completion of the 20 weekly emails.

Results
Thirty and 28 respondents completed the pre-email and post-email survey respectively (44.1% and 41.2% response rate, respectively). Sixty percent of respondents read the articles provided. Residents found the brief teaching tips to be more helpful and high-yield than the articles. Weekly email reminders were “just right” in frequency according to 74% of respondents. Fifty percent reported changing their teaching style following the weekly teaching tips: 33% (n=9) created more teachable moments, 7.4% (n=2) changed their teaching method, 7.4% (n=2) were more approachable, and one resident changed how feedback was provided.

Conclusion
Weekly email reminders are an easy way to encourage resident teaching. Residents typically find teaching tips to be more useful than articles.
THE MEDICAL EDUCATION ACADEMY: A SCHOLARLY HOME FOR TRAINEES TO DEVELOP SKILLS AS TEACHERS, EDUCATORS AND LEADERS

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BACKGROUND: Many residencies seek to develop future leaders in academic medicine. To achieve this, program leaders must consider not only how to develop and cultivate residents’ differentiation into their future clinical home, but also how to facilitate and support their differentiation into a scholarly home, for example in clinical research, quality improvement, or medical education.

INNOVATION: To give residents the resources they need to become future leaders in academic medicine, the Boston Combined Residency Program created four Academies in Investigation, Innovation, Medical Education, and Community/Global Medicine. This program was launched in July 2013. Every resident joins one Academy at the beginning of intern year and participates throughout residency. The goals of the Academies are to promote mentoring, support resident scholarly activity, and help residents develop the knowledge and skills needed for starting and advancing in an academic career. One of the unique goals of the Medical Education Academy is to improve trainees’ teaching and supervisory skills.

The Academy of Medical Education has achieved these goals by building a distinct curriculum designed to bring together residents and faculty in varied, in-person, protected forums, including hour-long interactive lectures, afternoon workshops and evening networking events. The curriculum provides an average of 1-2 hours of protected time each week, with approximately one afternoon or evening session for the Academy each month. Examples of interactive lectures include an introduction to Adult Learning Theory and Kolb’s Learning Styles. Workshops have focused on study sections and skill building sessions. Examples of study sections include an adaption of Daniel Kahneman’s “Thinking Fast and Slow” (2011) as it applies to medicine, and a review of recent articles by Kennedy et al (2007 and 2008) on supervision and safety. Examples of skill building sessions include Microteaching: Videotaped Teaching Segments with Consultative Feedback (Harvard MACY Institute), Teaching Procedural Skills, and How to Teach via Medical Games.

INITIAL OUTCOMES: The Medical Education Academy has been extremely successful to date. In fact, when the members of the Medical Education Academy were asked how they feel about the educational value of afternoon workshops, 86% percent responded either very positive (64%) or generally positive (21%). We plan to expand the program in the upcoming years by developing more content areas and skill-building sessions in areas such as simulation, case-based teaching, bedside teaching, curriculum development, survey design, and more. Future focus also includes objective measurement of impact.
EDUCATION ON THE BRAIN: A PARTNERSHIP BETWEEN THE CHILDREN’S HOSPITAL PRIMARY CARE CENTER AND THE BCH NEUROLOGY RESIDENCY

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BACKGROUND: Although neurologic complaints represent a large portion of pediatric primary care visits and hospitalizations, the Boston Combined Residency Program does not require any formal pediatric neurologic training. As a result, pediatric neurology residents have limited opportunities to educate general pediatric residents.

INNOVATION: During the 2013-2014 academic year, the Children’s Hospital Primary Care Center (CHPCC) and the Boston Children’s Hospital (BCH) Neurology residency formed a partnership to (1) increase the amount and quality of neurologic education provided; (2) improve pediatric resident knowledge and neurologic exam skills; (3) enhance specialty access and increase shared management of patients with neurologic issues; and (4) improve neurology resident teaching skills. The intervention included in-person, telephone, and EMR-based teaching. Neurology residents spent 1-2 afternoons per week in the CHPCC clinic observing resident neurologic exams, giving lectures, and providing in-person advice related to neurologic complaints. In addition, a virtual education pager was created to allow for telephone triage and advice regarding neurologic issues. Lastly, as part of a global effort to improve primary care chronic disease management, an EMR-based referral system was instituted. This system provided pediatric residents with a template for referrals and the ability to request advice. Neurology residents monitored these referrals to provide education, triage referral urgency, and request additional workup when indicated. Pre- and post-surveys were completed by pediatric residents detailing their participation, neurologic knowledge, and perceived utility of these interventions. A survey of neurology residents was also completed to evaluate the utility, sustainability, and acceptability of this approach.

INITIAL OUTCOMES: Of pediatric residents surveyed, 84% had at least one neurologic exam observed, with 69% of these residents finding the experience very or somewhat helpful. Of the 31% who completed an EMR-based referral, 83% found this experience very helpful. Among neurology residents, 100% personally triaged patients and observed resident exams. 25% felt that the observed examinations had limited value when they took place in CHPCC. 100% felt that questions submitted via the virtual pager were appropriate. Of the 85% who used the EMR-based referral system, 67% found them helpful. Overall, neurology residents preferred teaching that occurred via the virtual pager or EMR-based system and did not feel these were overly time-intensive activities.

FUTURE DIRECTIONS: This partnership increased educational opportunities for pediatric and neurology residents. The increased workload did not seem to represent a significant burden for neurology residents. The next cycle will focus on redesigning the observed examination process and continuing the virtual pager and EMR-based referrals.