A Simulation-based resident-as-teacher program: the impact on teachers and learners

Eli Miloslavsky M.D. & Paul Currier M.D.

Utilization of high-fidelity medical simulation in both undergraduate and graduate medical education has continued to expand across medical specialties. Its effectiveness has been demonstrated over a range of areas, including procedural training, clinical decision-making and communication skills. Additionally, simulation may be a valuable tool in the development of teaching skills. Facilitating a simulation session requires a range of skills important for educators, including direct observation, facilitating reflection, assessing learners and delivering feedback. Moreover, simulation allows facilitators the opportunity to apply these skills in a controlled clinical environment which can be difficult to replicate on the wards. Most importantly, simulation offers the opportunity to engage in deliberate practice by enabling the facilitation of the same case on multiple occasions with different learners. The combination of these attributes makes simulation a truly unique environment for the development of teaching skills.

A major barrier to the implementation of robust simulation programs is the amount of faculty hours required to offer a multi-case curriculum while keeping the learner-teacher ratio low. Larger training programs, such as those in Internal Medicine, are particularly affected. At the Massachusetts General Hospital Internal Medicine Residency Program we sought to overcome this barrier by developing a simulation curriculum administered and facilitated by residents with faculty supervision. We developed the program in a step-wise manner as described in Table 1. Currently, the program delivers a 20 case curriculum to internal medicine interns and a 6 case curriculum to second year residents, with resident facilitators providing over 1,000 hours of instruction throughout the course of the program. The curriculum is administered by 5 senior residents leaders or ‘simulation chief residents’, supervised by the authors. The resident leaders develop the schedule, optimize the curriculum, recruit resident facilitators and work with the authors on facilitator training. This structure provides sustainability and promotes continuous innovation, as well as an important leadership opportunity for residents interested in medical education.

In order to optimize the development of resident teaching skills, we embedded a formal resident as teacher (RaT) program into the intern simulation curriculum. As part of the program, resident facilitators participate in a one-hour facilitator training workshop and receive direct observation and feedback during the sessions they facilitate. In order to assess the impact of the program we utilized pre- and post-program resident self-assessment and post-session and post-curriculum evaluations by intern learners. During the study we were able to assess 34 of 41 residents who served as facilitators during the curriculum. Resident facilitators reported that participation in the RaT program had a significant impact on their teaching and feedback skills, both within and outside of the simulation environment. Resident facilitators also noted an improvement in their medical knowledge as a result of participating in the simulation curriculum. Intern learners completed a Debriefing Assessment for Simulation in Healthcare instrument (DASH) after each session which demonstrated a high level of facilitator efficacy across multiple domains. Intern learners also rated the program highly on the post-curriculum evaluation.
In summary, simulation-basedRaT programs are unique in their ability to provide an opportunity for deliberate practice in a controlled environment. Our program improved resident facilitators' self-reported teaching and feedback skills, while delivering a robust simulation curriculum to intern learners. Our curriculum design may serve as a model for the development of simulation programs in large residencies which can be employed to improve both intern learning and resident teaching skills.

**MGH internal medicine simulation program development timeline**

<table>
<thead>
<tr>
<th>Year</th>
<th>Program Description</th>
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<tr>
<td>2011</td>
<td>Pilot program for interns with 6 cases administered over 15 sessions on a voluntary basis with second and third year residents facilitating.</td>
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<tr>
<td>2012</td>
<td>Mandatory 8 case curriculum administered July-October for all interns facilitated by second and third year residents</td>
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<tr>
<td>2013</td>
<td>Pilot of an additional voluntary 6 case curriculum for interns in the spring focusing on critical care medicine</td>
</tr>
<tr>
<td>2014</td>
<td>Addition of mandatory 6 case curriculum for interns in the spring focusing on critical care medicine</td>
</tr>
<tr>
<td>2015</td>
<td>Pilot of a voluntary 6 case curriculum for second year residents, facilitated by third year residents</td>
</tr>
<tr>
<td>2016</td>
<td>Addition of a mandatory 6 case curriculum for second year resident, facilitated by third year residents</td>
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**Congratulations to our Academy Member Dorothy Sippo on her career award!**

HMS Academy Fellow in Medical Education Research, Dorothy Sippo, MD, MPH has just been selected by the Association of University Radiologist to receive the competitive GE Radiology Research Academic Fellowship (GERRAF) Award ([https://www.aur.org/GERRAF/](https://www.aur.org/GERRAF/)). Dr. Sippo is a Radiologist in the Breast Imaging Division at Massachusetts General Hospital. The GERRAF is a two-year early career development award that provides protected time, resources and training for the fellow to complete a research project focused on outcome research, health services research, informatics and related areas. Dr. Sippo's project is entitled, "Development and Assessment of an Automated Outcomes Feedback Application to Optimize Radiologist Performance Using Digital Tomosynthesis with Mammography".

Dr. Sippo applied skills learned in her HMS Academy in Medical Education Research Fellowship to develop the proposed automated outcomes feedback intervention and plan evaluation of this intervention. Reflecting on her experience as an Academy Fellow, Dr. Sippo said: "The instruction and mentorship that I received as an Academy Fellow was invaluable to my preparation of the GERRAF Award application. Under the guidance of Dr. Amy Sullivan, I conducted focus groups which provided key pilot data for my application. Amy Cohen, EdM, was instrumental in helping me to organize and present quantitative pilot data. The Fellowship also taught me how to design an intervention informed by cognitive and behavioral learning theories.

**Upcoming Academy Events**
Medical Education Grand Rounds:
Teaching how to Teach: The Growing Expansion of "student-as-teacher" Programs
Wednesday March 15, 2017// 4:00-5:30 PM// TMEC 227 - RSVP
Taylor Freret, BA, Med (HMS 2017)
Jasmine Rana, BA (HMS 2017)
Click here for more information

*Save the date: Symposium on the Science of Learning*
Thursday April 13, 2017// 9:00-12:00 PM // Armenise Amphitheater Warren Alpert Building
Click here for an overview of this event // Complete program details to follow // Speakers include:

K. Anders Ericsson, PhD
Conradi Eminent Scholar
Professor of Psychology
Florida State University

Maria Mylopoulos, PhD
Scientist & Associate Director - The Wilson Centre
Assistant Professor, Department of Paediatrics, University of Toronto
Scientist, Undergraduate Medical Education & Medical Psychiatric Alliance

For the complete calendar of Academy Faculty Development Programs click here

Request for Applications:
The Academy Fellowship in Medical Education Research
Fellowship period:
1 year fellowship - September 1, 2017 - June 30, 2018
2 year fellowship - September 1, 2017 - June 30, 2019

All the applications are due by
Monday, February 20, 2017

For more information regarding this fellowship please click here

If you have questions about the Academy Fellowship in Medical Education Research, please contact The Academy at Academy@hms.harvard.edu
Request for Applications:
The HMS Academy
Medical Education Fellowship
Fellowship period: July 1, 2017 - June 30, 2018

All the applications are due by
Monday, March 6, 2017

For more information regarding this fellowship please click here

If you have questions about The HMS Academy Medical Education Fellowship, please contact The Academy at Academy@hms.harvard.edu

Who's who
in the Harvard Medical School Academy

Dr. Morse serves as Founding Co-Director of EqualHealth and Deputy Chief Medical Officer for Partners in Health (PIH). She also serves as an advisor to the Medical Director of Mirebalais Hospital, a newly built public academic medical center established through a partnership between the government of Haiti and PIH. Previously, she served as Director of Medical Education at Mirebalais Hospital. In July 2015, she assumed the position of Assistant Program Director for the Internal Medicine residency program at the Brigham and Women's Hospital in Boston, a Harvard Medical School affiliate. Dr. Morse also works as a Hospitalist at Brigham and Women's Hospital, a Clinical Instructor on the faculty at Harvard Medical School, and as an affiliate of the School's Department of Global Health and Social Medicine. In 2010, Dr. Morse co-founded EqualHealth (www.equalhealth.org), an NGO that aims to inspire and support the development of Haiti's next generation of healthcare leaders through improving medical education and creating opportunities for health professionals in Haiti.

Michelle Morse, MD, MPH

Dr. Morse earned her B.S. in French in 2003 from the University of Virginia, her M.D. from the University of Pennsylvania School of Medicine in 2008, and her MPH from the Harvard School of Public Health in May 2012.

Rachel Roditi, MD

Rachel Roditi, MD is an attending Otolaryngologist at Brigham and Women's Hospital and an Instructor of Otolaryngology at Harvard Medical School. She has been a leader in medical education for the division of Otolaryngology at Brigham and Women's, serving as clerkship director for the Otolaryngology portion of the Core Surgical Clerkship as well as for the Advanced Clinical Otolaryngology-Head & Neck elective. Dr. Roditi is interested in curriculum development and assessment for both medical students and early trainees. She served as Course Director for the PDII-Head & Neck Symposium, gathering educators from across institutions to teach examination skills to preclinical medical students. She has also been involved in the head and neck curriculum for the new Practice of Medicine Course as Harvard Medical School transitions to the Pathways curriculum. As a member of the Academy, she hopes to develop innovative methods to contribute to teaching and education of contemporary learners.

Rachel Roditi, MD
Upcoming Medical Education events
& announcements that might interest you
(Listed in order of occurrence or deadline)

Mindful Practice in Medicine CME Retreat Program
Course Directors: Mick Krasner MD, Rick Epstein MD and Zev Schuman-Olivier, MD
Saturday & Sunday, March 18th-19th, 2017 ~ 9:00 AM - 5:00 PM

Mindful Practice in Medicine, a CME Retreat Program specifically designed for health care professionals, offers tools to bring mindfulness to your work as a healthcare provider and in everyday life. Mindfulness training has been shown to promote vitality and enhance resilience. In the face of constant stress and immense ongoing change in our lives and work, this event offers an opportunity to practice mindfulness and find support among others in the healthcare community.

This evidence-based retreat and webinar series applies mindfulness training to common challenges facing healthcare professionals. The original Mindful Practice program was tested with a gold-standard RCT, reporting reduced burnout and increased well-being with results published in JAMA. This workshop is designed for both beginners and those who already have a practice.

No mindfulness experience required.  
[Click here for more information regarding this event]

Principles of Medical Education: Maximizing your Teaching Skills
Sponsored by the Carl J Shapiro Institute for Education and Research at Harvard Medical School and Beth Israel Deaconess Medical Center
Wednesday March 29-31, 2017

The newest version of the CME course, Maximizing Your Teaching Skills, will be held at the end of March 2017. The course has been expanded over the past several years to offer more small group sessions on advanced skills including concept mapping and peer observation. There is also an optional simulation component, and we continue to hold 5 workshops in which all participants are engaged as part of the core curriculum.

Interest in the course remain very high (we sold out again last year) and we encourage everyone with an interest in an intense experience to sharpen your skills to sign up for the course. More details can be found at: [http://www.medicaleducators.hmscme.com/](http://www.medicaleducators.hmscme.com/)
Podcast of Past Academy Events: Medical Education Grand Rounds

Curriculum reform: Plus ça change?
Wednesday, September 14, 2016

Brian Hodges, MD, PhD, FRCPC
Executive Vice-President Education, University Health Network; Professor, Department of Psychiatry, University of Toronto; Scientist, Wilson Centre for Research in Education; Richard and Elizabeth Currie Chair in Health Professions Education

For the podcast of this event click here

The Use of Virtual Team-based Learning in Global Education
Friday, October 28, 2016

Ajay Singh, MBBS, FRCP, MBA
Senior Associate Dean for Global and Continuing Education
Director, Master in Medical Sciences in Clinical Investigation (MMSCI) program
Harvard Medical School

For the podcast of this event click here

Breaking Down the Barriers to Diversity and Inclusion
Friday, November 18, 2016

Joan Reede, MD
Dean for Diversity and Community Partnership, Professor of Medicine Harvard Medical School

For the podcast of this event click here

A system-based Vision for Medical Education in the 21st Century
Friday, December 16, 2016

Robert Englander, MD MPH
Associate Dean for Undergraduate Medical Education, University of Minnesota Medical School

For the podcast of this event click here
Addressing Student Learning Challenges in the Context of Case Based Collaborative Learning and Clerkship Environments

Monday, February 6, 2017

Richard Goldhammer, EdM
Learning Specialist and Educational Consultant, Harvard Medical School

For the podcast of this event click here
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