



**Boston University** School of Medicine

Welcome to

## **The Tenth Annual John McCahan Medical Campus Education Day**

Dear Colleagues,

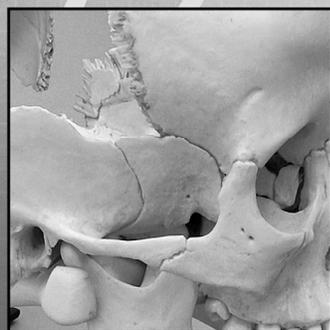
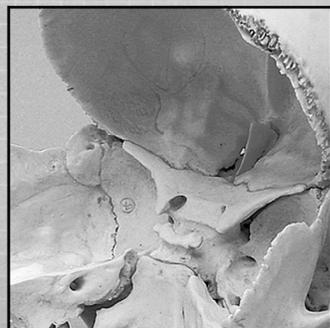
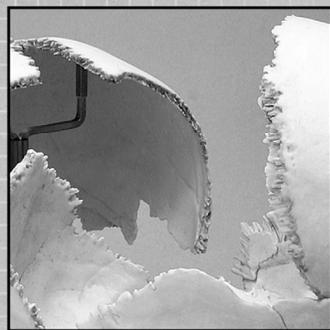
Welcome to the tenth annual John McCahan Medical Campus Education Day. Dr. McCahan served as distinguished Associate Dean for Academic Affairs at Boston University School of Medicine for 30 years.

We are pleased to offer Boston University Medical Campus educators a day for stimulating speakers to inspire and workshops for sharing innovative ideas. Posters and oral presentations will cover a variety of topics to aid our educators in improving and reevaluating how we teach students, including: evaluation, testing and assessment techniques, educational models and methods. This day provides an opportunity to consider your teaching ideologies and connect and dialogue with your colleagues.

Our keynote speaker this year, Jo Shapiro, MD, FACS, is an Associate Professor of Otolaryngology at Harvard Medical School, Director of the Center for Professional and Peer Support and Chief of the Division of Otolaryngology at the Brigham and Women's Hospital (BWH). She serves as President of the Society of University Otolaryngologists and served as the Associate Director of Graduate Medical Education for Partner's Healthcare. A founding member of the Harvard Medical School Academy for Teaching and Learning, she has a particular interest in building professionalism and peer support programs.

A handwritten signature in black ink, appearing to read "Karen H. Antman".

Karen H. Antman, M.D.  
Dean, Boston University School of Medicine  
Provost, Boston University Medical Campus



YES, IT'S REALLY A CAST!



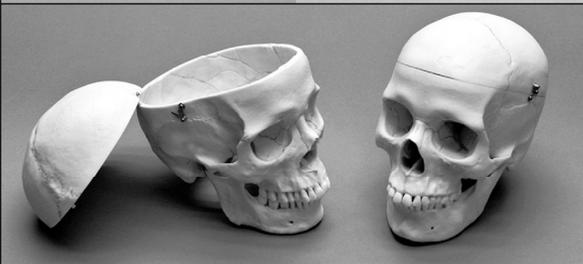
**Bone Clones®**

OSTEOLOGICAL REPRODUCTIONS

See our entire extensive collection  
of museum quality reproductions at

[www.boneclones.com](http://www.boneclones.com)

Click on "Advanced Anatomy" to see our  
medical quality adult, child and fetal skulls  
and skeletons (as well as 2500 other products)  
or call toll-free (US only) at 800-914-0091



ANATOMY • ZOOLOGY • ANTHROPOLOGY • PALEONTOLOGY • FORENSICS

## **ACKNOWLEDGMENTS**

---

John McCahan Medical Campus Education Day is an initiative of the Medical Education Committee (MEC), supported by Provost and Dean Karen H. Antman, M.D. The MEC acknowledges with appreciation the work of the following faculty and staff who have contributed to the planning of this event:

### **The John McCahan Medical Campus Education Day Planning Committee:**

<b>Department of Medical Science &amp; Education</b>	Hee-Young Park (Chair) Theresa Davies Maura Kelley
<b>Education Media</b>	Jana Mulkern Kenith Wilson Dan Madigan
<b>GSDM</b>	Anita Gohel (General Dentistry) Andrea Maalouf (General Dentistry)
<b>SPH</b>	Sophie Godley (Community Health Sciences) Rob Schadt (Teaching, Learning and Technology)
<b>Educators</b>	Paige Curran (Office of Student Affairs) Ariel Hirsch (Radiology) Stephanie Oberhaus (Microbiology) Kitt Shaffer (Radiology) Aaron Young (Physiology) Ann Zumwalt (Anatomy & Neurobiology)
<b>Alumni Medical Library</b>	Alissa Link Laura Spiller

### **The Planning Committee acknowledges with appreciation the support from the following offices that have made this meeting possible:**

Division of Continuing Education, Boston University Goldman School of Dental Medicine  
Division of Graduate Medical Sciences, Boston University School of Medicine  
Office of the Dean, Boston University Goldman School of Dental Medicine  
Office of the Dean, Boston University School of Medicine  
Office of Medical Education, Boston University School of Medicine  
Office of the Dean, Boston University School of Public Health  
Office of Facilities Management and Planning  
Educational Media Center/Instructional Services

### **The Planning Committee acknowledges with appreciation the support and participation of the following educational vendors:**

**Bone Clones**  
**Elsevier / Anatomy One**  
**Elsevier**  
**ExamMaster**

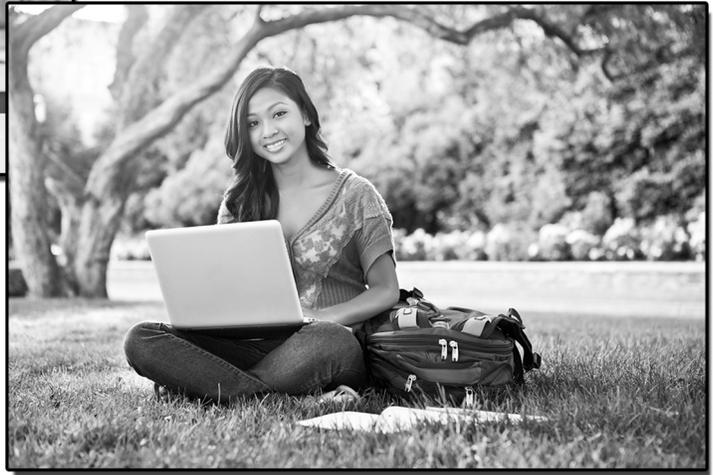
**Exam Soft**  
**Harvard Macy**  
**nVivo**

# Everything you need to succeed!



*In the classroom...*

*and on the green!*



## **EXAM MASTER OnLine®**

*Your partner for testing excellence™*

- Medical Students- USMLE Steps 1\*, 2 CK\*, & 3 Prep & Review
- Residents - USMLE / Medical Specialty Board Prep & Review
- Physicians - SPEX Board Prep & Review
- Physician Assistants - PANCE / PANRE\* Prep & Review
- Dental Students - NBDE Part 1 Prep & Review

\* Indicates Practice Exams Available

To learn more visit:

# ExamMaster.com

# bu.myexammaster.com



# IMPROVING STUDENT PERFORMANCE FOR A WORLD OF BETTER DOCTORS

ExamSoft SofTest Courses Performance Support

### Longitudinal Performance Summary:

1 Date Range  
Between: 09/01/2013 and 01/15/2014  
2 Courses  
Med 1  
Reset

Previous | Next

Learning Outcomes*	Questions	Class Average
<b>Cognitive Domain</b>		
Recalling	150	
Understanding	125	
Applying	75	
<b>Med 1 Learning Outcomes</b>		
Behavioral Sciences	250	
Biochemistry	222	
Biostatistics & Epidemiology	150	
Cardiovascular System	110	
Gastrointestinal System	75	
General Principles of Health/Disease	125	
Genetics	110	
Gross Anatomy & Embryology	70	
Hematopoietic & Lymphoreticular Systems	72	
Histology & Cell Biology	85	

ExamSoft SofTest Courses Performance Support

### Strengths and Improvement Opportunities

#### Diagnosis Medical Clinical Mid-Term

Course: Diagnosis • Instructor: Cassidy, Deanne • 6/24/2013

**81%** My Score (21/25)\*  
**84%** Average Score (21/25)\*

#### Medical Practical - General Survey

	Excellent <small>Above level of expected performance (4)</small>	Good <small>Level of expected performance (3)</small>	Satisfactory <small>Meets performance requirements (2)</small>	Unsatisfactory <small>Does not meet performance (1)</small>
<b>General Survey</b>	Verbalized observation of patient appearance: 1. Apparent state of health 2. LOC 3. Signs of distress 4. Hygiene 5. Height/Weight	Verbalized observation of 4-5 areas of patient appearance	Verbalized observation of 1-3 areas of patient appearance	Did not verbalize observation of patient appearance
Comments: Don't forget to check for signs of distress.				
<b>Pulse</b>	1. Checked pulse over the radial artery 2. Used pad of index and middle fingers 3. Counted for at least 15 seconds 4. Documented findings	Incorrectly performed 1 of the steps in checking the pulse	Incorrectly performed 2-3 of the steps in checking the pulse	
Comments: Great job!				
<b>Respiratory Rate</b>	1. With fingertips still on radial pulse 2. Watched the chest rise and fall 3. Counted the RR for 15 seconds 4. Documented findings	Incorrectly performed 1 of the steps in checking the RR	Incorrectly performed 2-3 of the steps in checking the RR	Did not check the RR or incorrectly performed the steps in checking the RR
Comments: You did well on your exam, but your accuracy on a patient was lacking.				
<b>Blood Pressure</b>	1. Arm free of clothing 2. Arm at heart level 3. Arm supported	Incorrectly performed 1 of the steps in checking the BP	Incorrectly performed 2-3 of the steps in checking the BP	Did not check the BP or incorrectly performed the steps in checking it

Schedule a tour: [learn.examsoft.com](http://learn.examsoft.com)

# Tenth Annual John McCahan Medical Campus Education Day

May 20, 2015  
Hiebert Lounge

## 2015 THEME

Teaching Professional Competencies: *Interpersonal Skills, Teamwork, Communication, Mentoring, Management and Adaptive Skills for a Changing Workforce*

## SCHEDULE OF EVENTS

---

- 7:45-8:30**                    **Meet & Greet with the Dean (Voluntary & Affiliate Faculty)**
- 8:30-8:40 a.m.**            **Welcome Address**  
Karen Antman, M.D.  
*Provost, Boston University Medical Campus*
- 8:40-9:45 a.m.**            **Keynote Lecture**  
***Changing Culture: Upending Our Notions of Professionalism***  
Jo Shapiro, MD, FACS  
*Director of the Center for Professionalism and Peer Support*  
*Chief of the Division of Otolaryngology*  
*Department of Surgery, Brigham & Women's Hospital*  
*Associate Professor of Otolaryngology, Harvard Medical School*
- 10:00-11:30 a.m.**        **Workshop Sessions**  
*See workshop listing p. 12-16 for descriptions and locations*
- 11:30 a.m.**                **Lunch/Networking/Vendors**
- 12:00**                      **Remarks from Dr. John McCahan**
- 12:15-12:45 p.m.**        **Panel of BUMC Academic Deans**  
Doug Hughes, M.D., *Associate Dean of Academic Affairs, BUSM*  
Hee-Young Park, Ph.D., *Assistant Dean for the Division of Graduate Medical Sciences, BUSM*  
Cataldo Leone, D.M.D., *Associate Dean for Academic Affairs, BUGSDM*  
Lisa Sullivan, Ph.D., *Associate Dean for Education, BUSPH*
- 12:45-1:45 p.m.**        **Award and Oral Presentations**  
*GMS Faculty Recognition Award*  
*BUGSDM Faculty Recognition Award for Educational Innovation*  
*BUSPH Educational Innovation Award*  
*BUSM Office of Academic Affairs Voluntary Faculty Award of Excellence*  
*BUSM Office of Academic Affairs Excellence in Service Award*  
*(See page 10 for descriptions)*

## **SCHEDULE OF EVENTS** *(continued)*

### **Abstract Awards – Oral Presentations**

#### **Best Faculty Abstract**

*“Added Value: Leveraging four-week medical school electives in quality improvement to create meaningful educational experiences and effective rapid cycle improvement projects”*

**Jodi F. Abbott, M.D.** Boston University School of Medicine, OB/Gyn  
*See abstract listings page 23*

#### **Best Faculty Abstract**

*“A Cross-Discipline Evaluation Of Practice-Based Teaching: Designing And Conducting An Evaluation Of Innovative Teaching Methodology Across MPH Disciplines”*

**Jacey Greece, Dsc, MPH,** BUSPH Community Health Sciences  
*See abstract listings page 34*

#### **Best Student Abstract**

*“Implementation of a BUSM Student-Led Service-Learning Initiative, Pumpstart: CPR Education for Inner-City High School Students”*

**Nikita Saxena, BUSM ‘18,** Pooja Shah, BUSM ‘18, Anita Knopov, BUSM ‘18, Clare Eichinger, BUSM ‘18, Victoria Fox, BUSM ‘18, Kevin Wilson, BUSM ‘18, Ricky Kue, MD, MPH, Department of Emergency Medicine, BUSM  
*See abstract listings page 48*

**2:00-3:30 p.m.      *Poster Session/Networking/Vendors***

Educational Vendors will be showcasing their products in Hiebert Lounge after 9:00 a.m. throughout the day

## **John F. McCahan, M.D.**

---

Dr. John McCahan served as the Associate Dean for Academic Affairs at Boston University School of Medicine from 1976 until 2006. From November 2003 through May 2005 he also led the School of Medicine as the Acting Dean.

Dr. McCahan received his B.A. and M.D. degrees from the University of Pennsylvania. He subsequently trained in internal medicine at the Upstate Medical Center, Pennsylvania Hospital and Guy's Hospital, London. Following two years of service in the United States Public Health Service at the National Communicable Disease Center in Atlanta, he joined the staff at Lincoln Hospital in the Bronx and the faculty at Albert Einstein College of Medicine. He was appointed Director of the Department of Medicine at Lincoln Hospital in 1972. During this period Dr. McCahan was centrally involved in student and post-graduate training programs and became particularly invested in the care of the poor and the provision of health care services to underserved populations.

Following his recruitment to Boston University in 1975 as Associate Professor of Medicine, Dr. McCahan continued clinical practice with underserved populations through the Home Medical Service (now the Geriatrics Home Service). He regularly preceptored fourth-year students on home visits to frail elders. He developed a teaching program in family medicine and became a Professor of Family Medicine following the establishment of that department in 1997.

After his appointment as Associate Dean for Academic Affairs in 1976, Dr. McCahan oversaw numerous revisions and reforms of the M.D. curriculum. He guided a major change in curriculum governance and chaired the Medical Education Committee, created in this reorganization. Throughout his career he had a particular interest in the patient-doctor interaction and the teaching methodologies that resulted in effective clinical skills. He has actively taught, studied, and administered a variety of educational formats from large group lectures to one-on-one teaching, feedback, and evaluation. In recognition of his excellence as an educator, Dr. McCahan received the Frederick Jackson Teaching Award and faculty membership in AOA.

In addition to serving as chairman of numerous administrative and educational committees, Dr. McCahan was the principal investigator of several grants and contracts, including a PHS-BHP Grant to Establish a Department of Family Medicine; a PHS-BHP Predoctoral Training Grant in Family Medicine; and a Community Partnerships with Health Professions Education Initiative, W.K. Kellogg Foundation. He served as BUSM liaison and author of the Boston section of a plan for a statewide Area Health Education Center program. Throughout the years he earned the admiration of his colleagues for his ability to articulate and implement a clear vision of modern medical education.

# Harvard Macy Institute

## Professional Development Programs for Academic Leaders



Become a Digital Citizen –  
Technology in Health Care Education  
**October 19-23, 2015**

Program for Post-Graduate Trainees:  
Future Academic Clinician-Educators  
**December 12-14, 2015**

Program for Educators in the  
Health Professions

**January 10-20 and May 6-20, 2016**



A Systems Approach to Assessment  
in Health Professions Education  
**March 6-11, 2016**

Program for Leading Innovations  
in Healthcare and Education  
**June 12-17, 2016**

## Leading Change

Since 1994 the Harvard Macy Institute has inspired and promoted real organizational change by training individuals, groups, and organizations across the continuum of medical education, health care, and academic leadership. Through programs based at Harvard Medical School and held at institutions around the world, the Institute brings together health care professionals, educators, and leaders to engage the critical challenges of the day and design innovative solutions that have a lasting impact on the way medicine is practiced and students are educated. The Institute is a collaborative effort of the faculties of Harvard's schools of medicine, education, and business. In addition, it has created educational opportunities through its alliance with the global health care community.

Applications now accepted online at [www.harvardmacy.org](http://www.harvardmacy.org)

2015-2016

## **John McCahan Medical Campus Education Day Awards**

---

### **BUSM Office of Academic Affairs Voluntary Faculty Award of Excellence**

This award honors our voluntary faculty members, community-based physicians who teach medical students and/or residents in one of BUSM's external teaching programs or travel to BUMC to teach on campus. These individuals are honored for their commitment to teaching, quality of teaching, impressive student evaluations and their overall commitment to the teaching mission of BUSM.

### **BUSM Office of Academic Affairs Excellence in Service Award**

The Office of Academic Affairs' Excellence in Service Award was established in recognition of BUSM Administrators and Staff whose outstanding work within the curriculum supports the success of the school, faculty, and students. Areas of excellence can include, but are not limited to service, leadership, innovation, and/or teamwork.

### **GMS Faculty Recognition Award**

The Division of Graduate Medical Sciences is committed to the highest quality educational experiences for our students. The GMS Faculty Recognition Award celebrates faculty who embrace our teaching mission by seeking ways to engage students in an active learning environment and by challenging students to think critically and supporting students to take ownership of their own scholarship. This award recognizes faculty that have gone above and beyond expected contributions by developing creative initiatives to our teaching mission including, but not limited to, innovative coursework, new curriculum design, and the support of an improved teaching and learning environment.

### **BUGSDM Award for Innovation in Education**

The Award for Innovation in Education goes to the faculty member who best exemplifies the characteristics that makes our students excited about learning. This faculty member, through the use of technology or alternative modalities of teaching and assessment, has been able to inspire and motivate his/her students to achieve competency in their subject matter while enhancing student learning.

### **BUSPH Educational Innovation Award**

BUSPH values its excellent reputation for innovative teaching and is proud to acknowledge excellence in teaching and learning through the BUSPH Educational Innovation Award. This award recognizes creative contributions to the development of tools for the innovative presentation of coursework, new curriculum design, and the creation of an improved teaching and learning environment.

The Educational Innovation Award is designed to reward faculty who are prepared to challenge the traditional ways of doing things, to try out new approaches and to seek improvements in the way teaching is delivered and learning is achieved. Its aim is to enhance the status of teaching, encourage innovation and disseminate good practice.



# Software to help shape tomorrow's education practices today!

Whatever your materials, whatever your field, whatever your working style, NVivo provides a workspace to help you at every stage of your assessment or research project.

## Start exploring today!

NVivo is your platform for analyzing all forms of unstructured data. Quickly interrogate data using powerful search, query and visualization tools. Get the big picture or get into the details. Uncover subtle connections, rigorously justify findings and effortlessly share your work.

## Find out what's possible

You can collect, organize and analyze content from surveys, focus groups, interviews, audio, video, social media, PDF files and web pages.

**Free Trial**

For more information visit [www.qsrinternational.com](http://www.qsrinternational.com)

[www.qsrinternational.com](http://www.qsrinternational.com) | [americas@qsrinternational.com](mailto:americas@qsrinternational.com) | 617 491 1850



# WORKSHOP DESCRIPTIONS AND LOCATIONS

---

All workshops run concurrently from 10:00-11:30 AM

## WORKSHOP A - Room R-107

### VIRTUALLY THERE: TECHNOLOGY OPTIONS FOR FLIPPED CLASSROOMS AND REMOTE MEETINGS

*MaryAnn Campion, MS, EdD, Assistant Dean, GMS*

*Jana Mulkern, MS, Instructional Services Manager - Medical Campus*

*Kenith Wilson, MEd, Educational Technologist Medical Campus*

This session aims to familiarize faculty and staff with various technologies that can be used to create flipped classrooms or virtual meetings. These innovative programs can be applied in various settings, such as **1)** bringing together students and faculty from multiple locations, **2)** including guest speakers who are unable to come to campus, **3)** holding class during inclement weather and/or when the campus is closed / offering asynchronous activities for a flipped classroom **4)** holding office hours, **5)** as a screen-sharing tool to help students or colleagues trouble-shoot in real time, **6)** hosting webinars, **7)** recording presentations to be posted online, and **8)** hosting meetings with a remote participant option. Participants will watch demonstrations of two available technologies [Skype for Business (which has replaced MS Lync) and Echo-360] and be shown how to use features such as instant messaging, group chats, and inviting others, as well as apps on iPhones and iPads. We will introduce the advantages and limitations of various platforms by discussing on-campus support, cost (if applicable), software, hardware, audio/visual needs, available features, number of attendees, level of audience interaction, and options for recording and storing the content. The demos will be led by the three workshop leaders, and willing participants can play supporting roles for the local in-room portion of the demos if they are interested. Following a Q & A, participants will be given the opportunity for hands-on experience using their own laptops or other electronic devices or library lab computers. This type of experiential learning will enable participants to apply the material to their own unique interests and needs.

**Target Audience:** All BU-Kerberos bearing faculty and staff who would like to become more familiar with educational tools that can be used outside of the traditional classroom

**Rationale:** With an increasingly tech-savvy student population and the growing need to engage with others remotely as well as circumvent class/meeting cancellations due to weather or other unforeseen events, it has become imperative that faculty and staff become comfortable using tools to meet these needs. These tools can enhance the learning climate of university programs of study and offer remote and asynchronous participation options for both classes and meetings.

#### **Learning Objectives:**

At the end of the session the learner will be able to:

- ❑ Outline the rationale for using technology to create a flipped or hybrid classroom or virtual meeting
- ❑ Recognize situations in which these models would be advantageous
- ❑ Identify the key elements required for successful implementation of these new technologies
- ❑ Anticipate problems that may arise and appreciate trouble-shooting techniques that are available
- ❑ Record and distribute presentations and host virtual meetings and hybrid classes

#### **Overview of the session:**

- Didactic primer on the advantages and limitations of various technologies, including Skype for Business (which recently replaced Lync), Adobe Connect, ooVoo, Google hangouts, and Echo-360 (25min)
- Demo using Skype for Business and Echo-360 (since these are the programs fully supported by IS&T, BUMC-IT, and BUMC Educational Media (15min)
- Interactive hands-on portion that will allow participants to log in and test drive these technologies using their own personal devices or library lab computers. Instructors will be available for individual or group tutorials and trouble-shooting (40min)
- Q&A period (10min)

\* Note: attendees will be asked to bring their laptops or other electronic devices if they would like to participate in the hands-on activities. We would also like to request use of a library computer lab on the 11<sup>th</sup> floor or R-107.

# WORKSHOP B - Room L- 201

## OPTIMIZING MEDICAL EDUCATION THROUGH SITE DIVERSITY

*Anna DePold Hohler, M.D. BUSM Assistant Dean of Clinical Site Development*

*Monica Parker James, M.A. BUSM Project Manager of Clinical Site Development and Educational Innovation*

*Harley Goldberg, D.O., Director of Kaiser Permanente San Jose Campus*

**Target Audience:** Faculty and staff who would be interested in inter-institutional collaborations for research, education, and clinical care.

### **Rationale:**

The geographic reach and diversity of clinical sites is growing as educators identify opportunities to provide students with enriching educational experiences related to geography, patient population, care structures, medical technology, and healthcare innovation. To ensure educational parity and optimize student experiences at a broad range of affiliate institutions, we must cultivate effective mentorship, establish frameworks for strong inter-institutional communication, embrace telehealth and other medical technologies, and adapt to changing healthcare environments. We need to support preceptors at distant sites with professional development and online teaching opportunities. We must also capitalize on collaborative research potentials with the students and clinical faculty serving as facilitators of the inter-institutional experience.

Effective mentorship and support is critical to ensuring a high-quality medical education. Students spend a majority of their clinical years under the tutelage of physicians who are practitioners first and educators second. Clinical faculty are dedicated to their students and highly committed to medical education. They balance the roles of researcher and physician with those of mentor and educator. In the clinical education years, students rely on strong mentorship while gaining exposure to diverse patient groups, practice environments, and care structures. A robust institutional framework, a strong communication system, effective management, and adaptability are also crucial for successful inter-institutional collaboration.

### **Learning Objectives:**

- Describe inter-institutional collaboration opportunities through research, education, and practice collaborations.
- List suggested criteria for effective support system framework development, mentorship, communication, and management of clinical education across a range of clinical sites
- Discuss opportunities and challenges related to providing a cohesive learning experience across institutions
- Interactive discussion for opportunities for growth and development at outside institutions

### **Program Description: 90 min**

1. Overview of the workshop brief introductions, review Learning Objectives and goal setting:  
10 min
2. Establishing an effective support system framework, mentorship program, and communication system within a system to apply to inter-institutional sites:  
20 min
3. Developing inter-institutional collaboration opportunities through research, education, and practice collaborations:  
20 min
4. Interactive discussion for further BUMC research and educational collaboration:  
30 min
5. Wrap Up: Discussion of Next steps and Plans for Follow up  
10 min

## **WORKSHOP C - Room L - 1105**

### **AUDIENCE RESPONSE SYSTEM: A LOW COST AND TIME EFFICIENT TOOL TO ACCURATELY ASSESS THE EFFECTIVENESS OF CURRICULA**

*Mayank Sardana, M.B., B.S.; Intern, BMC Medicine Resident,*

*Sheilah Bernard, M.D., Director, Ambulatory Cardiology Services, Associate Program Director, Internal Medicine Residency Program*

This session aims at familiarizing the educators in undergraduate, graduate and continued medical education with using Audience Response System (ARS) as a tool to assess baseline audience knowledge and to tailor their teaching content to meet audience needs. Participants will understand the steps involved in preparing and effectively incorporating ARS question slides into their lecture presentation through hands-on training session. In addition, they will experience this testing format from audience standpoint by submitting their responses through ARS during the initial presentation.

#### **Target Audience:**

Faculty, residents and students who are interested or are involved in delivering lectures

#### **Rationale:**

During busy residency/fellowship schedules, assessment of curricula is rarely emphasized and without this important feedback, instructional content/methods are rarely modified to meet residents' needs. Pre and post-testing is one of the most utilized and trusted tools to assess efficacy of new and current curricula, but effective delivery methods for pre/post-testing require further investigation. We recently conducted a prospective controlled study to assess efficacy of Internal Medicine residency ambulatory subspecialty curriculum through pre and post-testing. An important observation from this study was significantly lower pre-test scores in ARS-based assessment group compared to paper-based group. This, likely, is related to the fact that multiple residents arrive late for the lectures and fill in the paper-based pretests at end of lectures, leading to inaccurate assessment of residents' baseline knowledge and hence, affecting evaluation of teaching curriculum. By using ARS, this factor is muted, as residents arriving late are still able to participate in 'true' pre-test assessment, which is embedded in the presentation. One major reason for us not being able to utilize ARS for all the pre-tests was the hesitancy in lecturers about preparing and incorporating question slides in their PowerPoint™ presentations because of lack of familiarity with using this methodology. Considering the time and cost efficient nature of this intervention, it calls for training educators to utilize this technology. In addition to the above advantages, using ARS provides on-the-spot feedback for lecturers leading to titration of lecture content to audience needs.

#### **Learning objectives:**

By end of this session, participants should be able to:

- Prepare and incorporate ARS based question slides into their power point presentations
- Set up the hardware and software required for these presentations
- Confidently run slide presentations
- Understand the evidence supporting role of ARS in assessing curricula

#### **Outline:**

1. Overview (15 min): Learning objectives, evidence supporting use of ARS as an assessment tool, results from our study at BMC, assessment of baseline audience knowledge of this subject through use of ARS clickers
2. Getting it started (15 min): Presentation on preparing and incorporating ARS question slides into PowerPoint presentation. Components of a sample ARS (Turning Point™) and how to set them up (hardware and software)
3. Practice session (30 min): Audience will split up in groups of 5-6 to incorporate and run ARS slides in a sample PowerPoint presentation.
4. Wrap up (15 min): Discussion on alternatives, including use of cell phone based answering technology. Q&A.
5. Note: We will highly appreciate if a computer classroom can be made available for this session, otherwise we can bring in multiple laptops for small group sessions.

## WORKSHOP D- Room L - 206

### THE PRINCIPLES AND TOOLS OF TEAM LEARNING - AN ACTIVE APPROACH TO CLASSROOM LEARNING

*Co-Facilitated by Taryn Vian, Ph.D., Department of Global Health and Rob Schadt, Ed.D., Office of Teaching and Digital Learning*

#### **Target Audiences:**

Faculty and Graduate Students from all Medical Campus Health Science Schools

#### **Rationale:**

Learning in teams, when effectively designed and facilitated, not only increases students' understanding and retention of content, but also builds professional collaboration skills. It fosters a level of critical thinking, energy and enthusiasm that is rewarding for both students and instructors. Students come to understand the value of working collaboratively in teams to use their learning to address complex, real world public health problems.

While we know the powerful learning that teams can encourage and the important skills students can gain, often teams fall short of their potential, and students become dissatisfied. The Teaching and Digital Learning team at BUSPH has produced an online module on effective teams to help support team learning in and outside of the classroom. The module is divided into three sections including how to effectively launch a team, encourage students to work in a team to achieve results, and help students assess the effectiveness of the team and individuals who comprise the team. The module includes instructions, handouts, videos and insights from the literature on teams and the experiences of SPH faculty.

In this session we will provide an overview of the module, debrief and examine participants' experiences working and learning in teams, and conduct exercises where participants experience using several of the tools presented in the modules. We will also consider one approach for using teams in a large class format. Participants will receive a hard copy of the module facilitator's guide.

#### **Objectives of Workshop One**

- Identify and explain the benefits and challenges in employing teams in health sciences courses
- Develop an awareness of tools available in the BUSPH Effective Teams online learning module
- Experience using several of the module tools
- Describe a team learning approach for use in large lecture courses

**Effective Teams Online Module - <http://sphweb.bumc.bu.edu/otlt/MPH-Modules/Teams/>**

#### **Agenda**

##### **10:00-10:15: Overview of Workshop**

- Inquiry - Why do we engage in interactive learning?

##### **10:15-10:30: Small Group Discussion**

- What kinds of team and group work do we use in our courses?

##### **10:30-10:40: What is an effective team?**

Module Exercise: Inquiry and brainstorm - "Think of a time when you were on a team..."

##### **10:40-11:00: Forming Teams - In groups of 4-5 people discuss:**

- What are the major problems or issues in using team learning in courses?
- What tools in the module can be used to address these issues
- What tools need to be added?

##### **11:00-11:15: Module Exercise - 4-player model Handout and Exercise**

##### **11:15-11:25: Team-Based Learning: How to use team learning in large (lecture room) and core courses?**

##### **11:25-11:30: Closing Reflection:**

- What are the takeaways from this workshop?
- What can you use and apply?
- What do you want to learn more about?

## WORKSHOP E- Room L - 214

### DIFFICULT FEEDBACK: A CRUCIAL SKILL FOR PROFESSIONAL DEVELOPMENT

**Jo Shapiro, M.D.**

*Chief, Division of Otolaryngology, Director, Center for Professionalism and Peer Support, Brigham and Women's Hospital, Associate Professor of Otolaryngology, Harvard Medical School*

Providing feedback to colleagues or subordinates/trainees is a critically important component of safe and productive work environments. Yet we too often approach these conversations with apprehension, dread and – at worst – denial and avoidance. In this interactive workshop Dr. Shapiro will facilitate discussion and have participants role-play scenarios of giving difficult feedback using a feedback algorithm that provides an accessible framework for successfully navigating even the most challenging feedback conversation.

**Target Audience:**

Faculty and staff who would like to gain skills in communication and giving feedback to colleagues and trainees

**Rationale:**

The literature is clear that open, effective communication is tied to safer and more productive work environments. Providing timely and appropriate feedback, both positive and negative, is central to effective communication. It is therefore critically important that we learn the skills necessary for having these often charged and difficult conversations.

**Learning Objectives:**

By the end of the session, participants should be able to:

- Identify the barriers to resolving conflict among colleagues or with subordinates/trainees
- Develop skills for using frame-based feedback to resolve conflict
- Apply the skill of using frame-based feedback to relationship building on all levels

**Outline:**

1. Brief introductions, review learning objectives and ask for participant input/reflection about their experiences giving feedback and having it not go well or avoiding giving feedback (10 minutes)
2. Review challenges inherent in giving feedback (5 minutes)
3. Review basic elements of constructive vs. destructive feedback (5 minutes)
4. Interactive role-play of giving and receiving feedback (10 minutes)
5. Review traditional approaches to giving feedback and explore a frame-based algorithm for use in having feedback conversations (10 minutes)
6. Interactive role-play of giving feedback using the frame-based algorithm as a guide (15 minutes)
7. Discuss and explore various reactions to feedback that might be encountered and explore appropriate responses to different reactions (10 minutes)
8. Review examples of situations when giving direct feedback in this manner is not recommended (5 minutes)
9. Discussion and Q&A: review main points covered and engage in interactive conversation about lessons learned and potential challenges (20 minutes)

# **ABSTRACT THEMES FOR POSTER PRESENTATIONS**

---

## **Education Technology**

These submissions are meant to demonstrate creative use of interactive technology to augment learning. Appropriate types of submissions include course or clerkship websites, electronic clinical case simulations, online didactics, computer – based faculty development resources and electronic evaluation instruments. Submitted projects should be non-commercial although industry funding is permitted if the content and control of the project resides solely with the faculty authors.

**Abstracts 1-4**

## **Education Innovation and Research**

These submissions showcase scholarship or ongoing research in education at BUMC. Projects can be presented prior to the completion of full evaluation. Examples of educational innovations include: development, implementation, or evaluation of educational tools, course curricula, simulations or innovative educational collaborations. For research, both quantitative and qualitative research may be submitted as well as research in progress.

**Abstracts 5-43**

\* Abstracts are ordered alphabetically by the last name of the primary author

## **GLOBAL HEALTH PREPARATION AND REENTRY MODULES: AN INNOVATIVE, INTERACTIVE, ONLINE, OPEN-ACCESS, MODULAR CURRICULUM FOR GLOBAL HEALTH ROTATIONS AND PROJECTS**

Gabrielle A. Jacquet MD MPH, Janis P. Tupesis MD, Megan Rybarczyk MD, Matthew M. Fleming BS, Silpa Gadiraju MD, Alison S. Hayward MD MPH, Payal Modi MD MSc, Justin G. Myers DO, Rachel A. Umoren MD MS, Scott G. Weiner MD MPH, Suzanne Sarfaty MD

**Program/Project Purpose:** A study published in 2013 showed that 55% of Emergency Medicine (EM) residency programs were involved in global health projects, the majority being resident electives (68%). A cross-institutional survey reported that 86% of EM residents voiced interest in participating in a global health rotation and that the majority of residents ranked EM programs with global health rotations higher than those without them. These findings are mirrored in other specialties as well.

Global health rotations place trainees in high-risk situations with regard to ethics, cultural sensitivity, and personal safety. It is important that academic institutions provide proper guidance and education to prepare trainees for safe and effective global health rotations. Many sources such as the CDC Global Health website and the book *International EM: A Guide for Clinicians in Resource-Limited Settings* (EMRA 2013) provide information about global health rotations, however none of these resources provides a timeline-based schedule for preparation. In addition, none of these resources provides an online interactive environment for participation, or an evaluation tool that residency program directors and medical school deans can track electronically.

**Structure/Method/Design:** We are creating a series of interactive modules that will prepare learners including medical students, resident physicians, and fellows to safely and effectively participate in global health rotations and projects. This series of *timeline-based* and *interactive* preparatory modules spans early preparation to readjustment on return. The curriculum will be a resource that all academic institutions can utilize; additionally the curriculum will be open-access, permitting faculty, other international practitioners, and the general public to use them as well. To our knowledge, the timeline-based and interactive structure of these modules makes them the first of their kind. The modules have been written by a team of global health experts including faculty and fellows, with contribution from residents and medical students. Upon finalization of the site design, American College of Emergency Physicians (ACEP) Information Technology will implement the design and hosting using the ACEP electronic Continuing Medical Education (eCME) system.

**Outcomes & Evaluation:** The outlines and content of all modules have been finalized, and online media and material is currently being constructed. In order to prepare for online release, the modules will initially be piloted by global health experts. Once modules have been released online and are available to all residencies, data can be collected tracking completion, performance, and corresponding ACGME milestone levels for residents and medical students.

**Going Forward:** The modules will be piloted in early 2015; the final product will be available soon thereafter. Input from participants and program directors will be gathered to track use, efficacy, and impact on training and to inform future improvements.

**Funding:** This project is partially funded by a grant from the American College of Emergency Physicians.

## ULTRA-HIGH DEFINITION VIDEO IN MEDICAL EDUCATION

Kung J, B.S., Lim S, B.A., Fernández J, M.D., Ortega R, M.D.  
Department of Anesthesia, Boston Medical Center

### **Introduction:**

Medicine is a constantly evolving field; one in which efficiency is a requirement. As the world becomes increasingly electronically connected and technically supported, so does medicine. Medical educators must ensure that medical students, residents, and our patients, are presented with comprehensive and up-to-date learning material that facilitates understanding and familiarity with a variety of techniques. Visual aids have been used since the advent of formalized medical training. With the rapid development of video technology in the 20th and 21st centuries, medical educators incorporated these tools into their instructional methods. We present a visual approach using ultra-high definition (4K) videos, which offers numerous advantages over commonly used high-definition (HD) videos as employed in medical education today.

### **Materials and Methods:**

A comprehensive literature review was performed using two separate search engines on the use of video technology to teach medical students, residents, and patients in order to provide an overview of the history of video use in medicine, as well as the evolution of video technology with medical applications. Selected articles were then analyzed and summarized to demonstrate the capacity of 4K video recordings.

### **Discussion:**

Literature review demonstrates a clear role using video in medical education today. Certain limitations with pre-existing technology have made integration difficult in certain cases. Video lectures and instruction afford students the ability to concisely review a large amount of information in a single session, thereby improving comprehension and knowledge integration. As such, video recordings of medical scenarios have increasingly become valuable teaching tools for physicians in training, as well as for patients. Ultra-high definition (4K) video, specifically, offers distinct benefits over the use of HD videos, such as improved resolution of intricate and detailed anatomy, and technical procedures. For example, it allows for visualization of complex surgical techniques at a proximity that would normally be difficult for trainees to approach in a standard operating room setup, as we demonstrate with our 4K video of a coronary artery bypass graft procedure. 4K videos afford the learner the ability to concisely review a large amount of visual information in a single session, thereby improving comprehension and knowledge integration.

### **Conclusion:**

The use of video assisted learning, specifically using 4K video, will substantially improve the quality of medical student and patient education, especially in fields where appreciation of visual and anatomic details are essential to skill mastery. We support the opinion of a panel of expert medical educators at the AAMC 2014 meeting that “robust resource allocation and institutional support in the adoption of new technologies in the teaching of physicians-in-training will not only allow medicine to keep abreast of rapidly developing advances in technology, but also result in physicians equipped to navigate an increasingly interdisciplinary and complex landscape that is modern medicine”.

## BREAKING GROUND WITH A DIGITAL BADGE PROGRAM IN MEDICAL EDUCATION

Gail March, Ph.D., Office of Medical Education

### BACKGROUND

The 2010 Carnegie Foundation Report asked for a reform in medical education.<sup>1</sup> Medical education is now shifting to learner-centered pedagogies with an explosion of new content and educational technologies. Can busy healthcare professionals implement these new changes when asked to teach current tech-savvy students? Journals document new ideas, but without a reader's application of the ideas. Teaching workshops require attendees to leave their practices. Most instructors also balance clinical/research commitments and are time-challenged to attend online faculty development programs. Practicing physicians do not readily engage in continued medical education (CME) that is non-clinical.<sup>3</sup> Medical educators need quick, accessible practical teaching and learning concepts, opportunities to practice, and recognition for their time.

### DESCRIPTION

Boston University Medical Education Digital Badge Program (BUSM+) applied the open-access of Massive Open Online Courses (MOOCs) with the popularity of a digital badge program to deliver medical education topics. Worksheets accompany video discussions for the viewer to stop the video and apply the content to their teaching situations. Zipinars encapsulate relevant accompanying session topics as pdfs. To connect users, assignments include blogs, wikis, and discussion threads. Completing a session results in a certificate; completing a number of sessions results in a badge level and CME credit. Will healthcare professionals engage in BUSM+ is the research question?

The purpose of BUSM+ Medical Education Digital Badge Program (BUSM+) is to provide an online teaching course for healthcare professionals and three digital badges to confirm their achievements. The objectives are for the badge team to research and design an online course in teaching and learning, develop and offer the course globally, analyze the outcomes, and set a process for other digital badge courses.

### METHODS

BUSM+, funded by a BU Digital Initiative Seed Grant, uses a web page to register and collect demographic data, presents the course and collects data in Blackboard Learn LMS, and sends achievement data to Mozilla Open Badge infrastructure to deliver the user's digital badge. BUSM+ ran January 5-April 6, 2015. The mixed-method study collects both quantitative (registration demographics and scores on pre- and post-tests plus assignment grades) and qualitative data (user feedback) to analyze.

### RESULTS

After researching the literature and consulting with content experts, the design was a 12 week course with 10 sessions and 2 catch-up weeks... The January BUSM+ course had 96 registrants from Armenia, Arizona, California, Illinois, New Jersey, Massachusetts, and Wisconsin. Four registrants transferred to the summer course and three dropped out due to technical difficulties. 83% registered to enhance their teaching. The educational level of the registrants was 80% with a doctoral degree. 61% female and 39% males were between the ages of 30 and 50+ years. The professions of the registrants were 55% physicians, 21% educators, 4% attending, 13% administrative directors, 4% fellows, and 3% medical students. The measurement of engagement data will be calculated, but the users mostly engaged on Sundays and Tuesdays.

### DISCUSSION

Breaking the ground with any new concept is challenging with some rejecting the open-access, asynchronous digital badge program while others jumped at the idea because they needed it. The significance of this first Boston University digital badge program in medical education is to open the opportunity for healthcare professionals to enhance their teaching skills and it successively engaged with limited marketing 96 registrants.

Lessons learned are participants have very limited time, so best practices are to have one-click options with navigation clues, color-coding, and extended time in catch-up weeks to complete assignments. A navigating Blackboard tutorial and an orientation week will be added because many users were new to an online course. Users also need weekly updates, feedback and encouragement. The peer reviews failed because users with assignments matched with no-show users, so collaborative assignments such as wikis, blogs, and discussion threads replaced them. The course with revisions will repeat this summer and five new courses are in development. Future expectations are users with digital badges with reformed medical education practices, expanded job opportunities, satisfied learners, and improved patient care.

1. Cooke M, Irby DM, O'Brien BC. Educating physicians: a call for reform of medical school and residency. San Francisco, CA: Jossey-Bass; 2010.
2. Mehta NB, Hull AL, Young JB, Stoller JK. Just imagine: new paradigms for medical education. *Acad Med.* Oct 2013; 88(10): 1418-1423.
3. Chan TM, Thoma B, and Li M. Creating, curating, and sharing online faculty development resources: the medical education in cases series experiences. *Acad Med.* March 2015; 90(6):1-5.
4. Seven things you should know about...badges. Educause Learning Initiative Web site. <http://www.educause.edu/library/resources/7-things-you-should-read-about-badges>. Published May 29, 2013. Accessed February 16, 2014.

## **AUDIENCE RESPONSE SYSTEM IS MORE EFFECTIVE THAN PAPER-BASED PRE-TESTING TO EVALUATE BASELINE RESIDENT KNOWLEDGE: A PROSPECTIVE CONTROLLED STUDY**

Mayank Sardana, MBBS, Sheilah Bernard, MD, FACC

### **Introduction:**

Audience Response System (ARS) has previously been shown to improve the audience participation and post-test scores in small studies, although a recent systematic review failed to show its effectiveness in improving learning outcomes. We sought to prospectively assess long-term retention during ambulatory curriculum among Internal Medicine residents at Boston Medical Center with use of pre- and post-testing utilizing ARS technology.

### **Methodology:**

Of 19 subspecialty ambulatory blocks from July, 2013 to February, 2015, ARS (Turning Point™) was used in 4 blocks for pre-testing, which was in the form of multiple-choice questions (similar to ABIM Internal Medicine Board Exam) before relevant content was presented. In the remainder 15 blocks, paper-based pre-testing was used, whereas post-tests (same as pre-tests) were all paper-based and were given four weeks later. To get real-time assessment, no incentives or special instructions were provided after first lecture and data from first two lectures was excluded in analysis.

### **Results:**

On performing paired and unpaired t-test analysis of 1079 test scores, mean scores improved from pre-tests to post-tests in both formats of assessment (19% in ARS-based and 9% in paper-based; both  $p < 0.05$ ). Using paired t-testing and ANOVA, pre-test mean scores were significantly lower in ARS based group compared to paper based group (54% vs 61%;  $p < 0.05$ ), whereas post-test mean scores were not statistically different (74% vs 70%;  $p = 0.4$ ). Resident participation in pre-testing was significantly higher in ARS group compared to paper-based group (69% vs 33%;  $p < 0.001$ ).

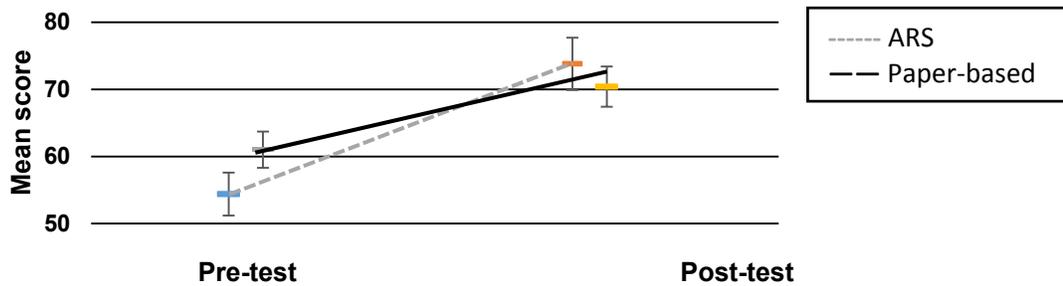
### **Conclusion:**

ARS based pre-testing embedded in lecture presentation is more effective than traditional paper-based pre-testing in accurately assessing baseline resident knowledge. This leads to improved resident participation and more effective evaluation of ambulatory curriculum. There is potential role for similar low-maintenance and cost-efficient ARS-based assessment across all curricula in UME, GME and CME, as the benefits have sustained over study duration.

## Mean scores in pre- and post-tests

	ARS	Mean score	Std. Deviation	N
<b>Pretest</b>	No	61.03%	29.47%	369
	Yes	54.44%	23.83%	249
	Total	58.38%	27.51%	618
<b>Post test</b>	No	70.37%	24.93%	286
	Yes	73.82%	25.51%	175
	Total	71.68%	25.17%	461

## Comparison of mean scores



## Resident participation in pre-testing

Modality	Participating	Not participating
ARS	249	111
Paper-based	369	711

\* Abstracts are ordered alphabetically by the last name of the primary author

## **ADDED VALUE: LEVERAGING FOUR-WEEK MEDICAL SCHOOL ELECTIVES IN QUALITY IMPROVEMENT TO CREATE MEANINGFUL EDUCATIONAL EXPERIENCES AND EFFECTIVE RAPID CYCLE IMPROVEMENT PROJECTS**

Jodi F. Abbott, M.D. *Boston University School of Medicine, OB/Gyn*

### **Short Description**

At Boston University School of Medicine we developed a novel opportunity for medical student quality improvement education. The curriculum leverages just-in-time didactic training with faculty-mentored frontline quality improvement projects. We offer two four-week QI electives. In the first, students are oriented to quality improvement methodology, specifically learning how to define an aim statement, family of measures, and tools to identify early changes for testing via PDSAs. Those who continue for a second month then take the identified changes and test them through PDSAs on the frontline areas of care. The student, program, and institutional outcomes reveal a high rate of student satisfaction, project completion, and knowledge acquisition by both self-report and increased scores on QI knowledge assessment tests. In 18 mos. students designed and implemented 29 successful projects with two or more PDSA cycles.

### **Background**

Medical students are expected to learn to both provide excellence in clinical care and to continually evaluate their practice to improve the care they deliver. The AAMC and WHO have both recommended that students complete their undergraduate medical education with the skills and knowledge to evaluate the process of care and to participate in projects to improve it, yet few publications<sup>1-2</sup> address meaningful QI education for UME. In 2013 the AAMC proposed an implementation time frame of 10 years, allowing the opportunity and need for QI competent faculty to be developed from our current trainee champions. At Boston University School of Medicine we have developed two fourth year quality improvement electives with curricula integrating didactic and experiential education. Curricular goals are to allow development of the tools and knowledge in QI processes and to foster participation in the application of QI methodology. Together these experiences will prepare student trainees to apply process improvement into their clinical practices, to become quality leads in their residencies, and to potentially continue as faculty QI leaders and educators. This program has also functioned to expand and provide support to a faculty cohort skilled and experienced in precepting student driven rapid cycle improvement projects.

### **Implementation**

The QI 1 and QI 2 elective courses are available to fourth year medical students during any month of their last curricular year and need to be taken sequentially, with the second month optional. In order to maximize impact for students across the organization the program was developed to allow participation in clinical projects, to date projects have been in one of 21 departments and divisions. The students are required to prepare in advance of the elective by securing preceptorship within the clinical department prior to course acceptance. Many, but not all preceptors are physician quality leaders with direct oversight of Quality and Patient Safety in their respective areas leads, and some clinical preceptors have had no QI experience or training, with the course directors providing more supervision and mentorship for these projects. For QI 1 students are required to complete the Institute for Healthcare Improvement Open School modules QI 1-5 prior to or in week 1 of the clerkship. The educational goals for QI1 are to identify a quality problem in a specific area, to assess and systematically analyze the problem using quality improvement tools and to design an intervention. The two electives are complementary, with the QI 2 requiring collecting data and implementing change for at least two tests of change (PDSA) cycles, and with the intent of submitting for completion of the IHI Open School 201 practicum.

### **Results:**

45 students have completed QI rotations at BUSM to date. During the first curricular year (2013-2014) 17 students completed QI 1, with 28 students in year two (2014-2015). A total of 9 students in both years completed QI 2. The program assessment was developed by Kirkpatrick criteria:

- 1) Student satisfaction with curriculum was high, with all students reporting highest educational effectiveness during the process of identifying a clinical problem, learning how to evaluate the process and designing an intervention under the supervision of a faculty mentor.

- 2) Student self-assessment of QI knowledge was assessed prior to the experiential course component (but after completing IHI QI modules) and post experiential course via an Assessment of Quality Improvement Competence (AQIC). The AQIC is a new assessment of QI knowledge application adopted from the QIKAT which is a validated<sup>3-4</sup> assessment of the students ability, after reading a case, to apply QI methodology by describing aims, measures, drivers, and process improvement design. The results demonstrated that the concepts and applications were reinforced and strengthened by the experiential course components.

**AQIC results:**

Pre Course score 21.6 std error 1.25

Post Course score: 24.7 std error .75

**% Students who began and successfully completed the course deliverables**

Year One: 94%

Year Two: 100%

- 3) Learner behavior change was assessed by the number of students who went on to complete the second elective QI 2, and to complete two PDSA cycles. Due to curricular time constraints more students continued working on their projects completing two PDSA's than formally took the QI 2 course, demonstrating a high commitment (as these students did not receive curricular credit for the second course despite completing the requirements).

**% Students who completed two PDSA cycles:**

Year One: 53%

Year Two: 65% (to date)

**% Students who took QI 2 course:**

Year One: 18%

Year Two: 24%

- 4) Short term outcome effectiveness was measured as % of projects that realized measureable improvement for the benefit of patients, and % learners who went on to abstract submission at conferences. All students who completed two PDSA cycles demonstrated improved clinical processes to benefit patients. Considering the rapid cycle structure of a limited time commitment project the high impact of the effectiveness of the student interventions speaks to both the advisor role in facilitating a successful project as well as to the dedication of the students themselves. To date, 12 students have presented abstracts at local meetings, and 7 at national meetings.

**Impact:**

The immediate impact from these electives have been in the increased number of champions for quality and safety education among the participants. The 29 projects with two or more PDSA cycles demonstrating success is a quite profound impact of an (current) 18 month program. The value of the projects to the organization in decreased errors, increased efficiency and cost containment is significant. There is increased visibility of quality improvement work being done by medical students and other trainees and increased engagement of faculty and administrators. The long-term impact on the participants themselves, by self report, shows intent to continue QI work into residency. We intend to quantify its impact on their continued participation QI and potential future leadership. This model of structured medical student electives with dual faculty supervision (content specific and central QI trained preceptorship) allows expansion of QI projects beyond those able to be supervised by QI trained leads and increases the scale both at a single institution and for expansion to other institutions. The impact goes beyond the current student participants, as the true effect will be that of the potentially exponential effect of grounding future QI leaders with fundamental tools and knowledge required for team based excellence in healthcare and education. Our model demonstrates that the process of creating curricular infrastructure and foundational grounding in QI process combined with advisor supported QI project design can be effective for both students and organizations and is in a format exportable to other clinical settings.

1. Weeks W, Robinson J, Brooks B, Batalden B. Using early clinical experiences to integrate quality-improvement learning into medical education. *Acad Med* 2000; (75)1. p81-84.
2. Stern Levitt D, Hauer K, Poncelet A, Mookherjee S. An innovative quality improvement curriculum for third-year medical students. *Med Educ Online*. 2012; 17:10.
3. Glissmeyer E, Ziniel S, Moses J. Use of the Quality Improvement (QI) Knowledge Application Tool in Assessing Pediatric Resident Education. *J GME*. 2014; (6)2; 284-291.
4. Singh M, Ogrinc G, Cox K, et al. The Quality Improvement Knowledge Application Tool (QIKAT-R). *Acad Med* 2014; (89) 10; 1386-1891.

## PROMOTING GERIATRICS TEACHING THROUGH A CHIEF RESIDENT IMMERSION TRAINING (CRIT) PROGRAM

Heidi Auerbach; Ryan Chippendale; Belle Brett; Megan E. Young; Lisa B. Caruso; Amy Sorensen-Alawad; Sharon A. Levine

**Background:** Non-geriatricians must acquire skills and knowledge to ensure coordinated care for older adults with multi-morbidity. Exposure to geriatrics principles in residency curricula is variable. The Chief Resident Immersion Training (CRIT) Program in the Care of Older Adults is designed to increase Chief Resident (CR) capacity to provide such education. We explored whether prior exposure to and attitudes towards teaching geriatrics are related to geriatrics topics taught six months post-CRIT (PC).

**Methods:** CRs completed baseline (BL) and 6-month PC surveys. Both surveys assessed topics taught in the past 6-months and attitudes towards teaching geriatrics. Independent variables: total hours of geriatrics training received 2 years pre-CRIT; total number of geriatrics topics taught at BL; confidence in, responsibility for, and enjoyment of teaching geriatrics. Dependent variable: total geriatrics topics taught at 6-months. Regression (list-wise) analyses were conducted with matched BL and PC surveys.

**Results:** 452 CRs from 17 institutions attended CRIT from 2008-2012. 78.7% completed follow-up surveys. Controlling for geriatrics topics taught pre-CRIT, total hours of geriatrics training received during residency and enjoyment of teaching geriatrics at follow-up were significant predictors of total topics taught at six months (both  $p < .001$ ). Enjoyment of teaching geriatrics pre-CRIT, responsibility for, or confidence in, teaching geriatrics post-CRIT were not predictors.

**Conclusions:** CRIT exposes CRs to geriatrics principles they can disseminate to promote better care of older adults. 6-month post-CRIT variation in the number of geriatrics topics taught by CRs suggests more research is needed to assess how geriatrics can be further integrated into residency education.

## CURRENT USE AND FUTURE DIRECTION OF DENTAL AMALGAM IN THE US: PEDIATRIC DENTISTS' PERSPECTIVE

Eman Bakhurji, BDS. Division of Dental Public Health. Dept. of Health Policy and Health Services Research. Boston University Henry M. Goldman School of Dental Medicine 560 Harrison Ave. 3rd floor, Boston, MA 02118. Tel: 617-794-9454. E: bakhurji@bu.edu

### **ABSTRACT**

#### ***Objectives:***

In 2013, the Minamata treaty, facilitated by the United Nations Environment Programme (UNEP), reached an international agreement on phase-down of dental amalgam use to minimize mercury pollution. This treaty, however, may result in unintended public health burdens, especially for vulnerable populations. Currently, the best strategies for the US are unclear. The aims of this study are to 1) determine pediatric dentists' opinion about the future direction of amalgam use, and 2) investigate factors associated with their decision to use amalgam.

#### ***Methods:***

All active AAPD member pediatric dentists (n=5101) in their database were invited to participate in an electronic survey. A 13-item survey was developed and pretested. The survey contained questions regarding their opinions about future directions for amalgam use. It also included a hypothetical clinical scenario of a child with dental caries, to investigate the dentist's decision regarding their restorative preference. The electronic survey was sent out anonymously using the Qualtrics™ software, followed by three reminders. Data analysis was conducted using SAS 9.3. Multinomial logistic regressions were used to investigate the participants' opinions about future direction for amalgam. Choice-based conjoint analysis was used to determine the trade-offs affecting the pediatric dentists' decision-making about amalgam use.

#### ***Results:***

The survey response rate was 17.6% (892 out of 5101). Only 850 responses were eligible for analysis in this study. Fifty-six percent reported using amalgam in their practices. The majority (68%) disagreed with banning amalgam; while 60% agreed with mandatory installation of amalgam separators. Eighty-eight percent of respondents were supportive of increasing reimbursement for preventive procedures. Multinomial logistic regression showed that respondents' opinion about banning amalgam and mandatory installation of amalgam separators varied by their environmental consciousness and perception about amalgam safety after controlling for covariates. Conjoint analysis revealed that both caries risk and type of dental insurance affected respondents decision about amalgam use, with caries risk more influential for choosing amalgam, than insurance status.

#### ***Conclusion:***

The majority of US pediatric dentists value amalgam as a useful restorative material, especially in certain populations (higher caries risk, uninsured). However, their use of amalgam is influenced by their awareness about the environmental impact of its waste. This finding supports the Minamata treaty recommendations for focusing on caries prevention to reduce amalgam use. Policies, including insurance reimbursement for prevention, and mandating amalgam separators to mitigate mercury pollution should be implemented.

#### ***Keywords:***

Dental Amalgam, Mercury, Pediatric Dentistry, Survey, Clinical Decision-making, Conjoint Analysis

## EMPOWERING INTERNAL MEDICINE RESIDENTS TO DISCUSS ADVANCE CARE PLANNING IN PRIMARY CARE CLINIC

Jessica Bender, M.D., Department of Medicine/Chief Resident, (2) Jennifer Russo, M.D., Department of Medicine, PGY-3, (3) Irina Vovnoboy, M.D., Department of Medicine, PGY-3, (4) Ryan Chippendale, M.D., Department of Medicine/Section of Geriatrics, (5) Sandhya Rao, M.D., Department of Medicine/Palliative Care Consult Service

### Needs and objectives

Advance care planning in primary care is increasingly important as the population ages, yet internal medicine trainees report lack of confidence and skills in leading these discussions. We conducted a needs assessment and educational intervention to improve the confidence and skills of internal medicine interns in discussing advance care planning in the primary care setting.

### Setting and participants

The study was conducted at Boston Medical Center, an urban academic medical center in Boston. Participants included categorical and primary care interns in an internal medicine residency program.

### Description of the program/intervention

A voluntary needs assessment survey was conducted to assess interns' attitudes about and confidence in leading advance care planning discussions in the primary care setting. Based on this needs assessment, several educational interventions were developed. First, a practice improvement module was created; each intern was asked to perform a chart audit to determine their baseline practice of advance care planning in primary care clinic. Second, based on the results of the needs assessment survey, a one hour, small-group educational session was developed to address areas of lower confidence. After the educational sessions, participants will conduct a second chart audit to determine if their practice has changed. In addition, a post-intervention survey will be conducted to determine if interns' confidence and attitudes have changed.

### Evaluation-measures of success

The needs assessment survey response rate was 86% (n=38). More than half of the respondents (68%) had not had formal training in advance care planning during medical school. The majority of respondents (74%) indicated that advance care planning in primary care is important or very important. However, 45% reported that they had not facilitated any advance care planning discussions with their primary care patients. Despite this low frequency of advance care planning discussions, interns reported a high level of confidence in discussing advance directives, naming healthcare proxies, and facilitating advance care planning in the ambulatory setting. Interns reported lower confidence (able to perform with distant or close supervision) in estimating prognosis and discussing changes in care needs. The most frequently reported barriers to facilitating ACP discussions were time (87%), patients with multiple comorbidities (76%), and provider confidence (42%). The most frequently reported factors that led to high prioritization of advance care planning were patient age (32%), functional decline (26%) and the existence of multiple comorbidities (24%).

### Discussion

This needs assessment survey indicates that participants had high levels of confidence in discussing advance care planning, yet they reported holding very few discussions in the primary care setting. It is possible that interns' high level of self-reported skill is due to experiences they have had in the inpatient setting, where they frequently are responsible for assisting patients in naming healthcare proxies, discussing goals of care, and leading family meetings. The interns' lower confidence in estimating prognosis in the outpatient setting likely results in an underestimation of the number of primary care patients who would benefit from advance care planning. Thus, the goal of the educational session was to increase interns' ability to identify patients who would benefit from advance care planning discussions. To facilitate this, the sessions focused on improving skills in prognosticating and on sharing strategies to overcome other barriers such as time and multiple comorbidities. The aggregate results of the initial and follow-up chart audits are still pending at this time but will be used to determine if this educational intervention results in a change in practice facilitating advance care planning with primary care patients.

## **SCHOLARSHIP IN A PRIMARY CARE TRAINING PROGRAM: A NEEDS ASSESSMENT**

Ryan Chippendale, MD; Jessica Bender, MD; Ricardo Cruz, MD

**Needs and objectives:** The ACGME requires participation in scholarly activity by all internal medicine residents, including residents in primary care training programs. However, many trainees do not have the skills and training necessary to successfully complete this requirement upon entry to residency. The main objective of this project was to assess primary care residents' attitudes, skills, and confidence in performing ACGME required scholarly activity during residency and in their future careers. Additional objectives were to develop a scholarship curriculum to address identified needs and to assess the success of the curriculum through outcomes measurement.

**Setting and participants:** Urban academic internal medicine residency program, internal medicine residents in the Primary Care Training program.

**Description:** We performed a needs assessment to inform the development of a scholarship curriculum for the Primary Care Training Program at our institution. This was accomplished through a voluntary, anonymous paper based survey administered to all primary care residents. The objective of this assessment was to examine primary care residents' practice of, attitudes about, and confidence in their skills regarding scholarship. Scholarship was defined as any of the following academic activities: presentation of an abstract, poster, or workshop at a professional conference; design and assessment of a quality improvement or educational project; authorship of an original peer-reviewed publication.

**Evaluation:** The survey response rate was 100% (n=12). Prior to residency, 83% of residents reported involvement in scholarship, while 67% of residents reported involvement during residency. The most frequently cited barrier to participating in scholarship during residency was lack of protected time, followed by confidence in skills and mentor identification. Attitudes about the importance of scholarship during residency were varied; 50% reported that scholarship was somewhat or not important, while 50% reported that scholarship was important or very important. 59% of residents indicated that scholarship will be relevant or very relevant to their future careers. Respondents reported lower confidence (requiring close or distant supervision) in several areas of scholarship including IRB submission, survey design, manuscript preparation, workshop design, and curriculum design. Respondents reported high confidence (mostly independent) in mentor selection, PowerPoint design, and oral presentations. Based on the results of this assessment, a three-year longitudinal curriculum was designed to address the gaps in knowledge and confidence identified. To measure success, pre-post curriculum data regarding the number and types of scholarly activities performed by primary care residents is being collected. Additionally, a post-survey will compare confidence and skills before the curriculum and upon graduation from the program.

**Discussion / reflection / lessons learned:** Primary care residents expressed some ambivalence about their interest in scholarship although the majority believe it to be important for their future careers. However, they report low confidence in their skills to undertake more advanced scholarly work that would actually lead to a peer-reviewed publication. There currently is a lack of research on how residencies should address these deficiencies. Through the development of our scholarship curriculum, we hope to reduce barriers to participation in scholarly activity to fulfill the ACGME requirement, but even more importantly to promote academic excellence after residency.

## LONGITUDINAL MENTORING IN A HIGHER EDUCATION SETTING

Theresa A. Davies, Ph.D., Department of Medical Sciences & Education, BUSM, GMS

### Abstract:

**Introduction:** Peer mentoring has become common in public education as well as higher education and many studies have demonstrated the positive value of the relationships built. The peer mentoring model presented here has been used successfully in a higher education setting with students from both graduate (MS) and professional (DMD) schools utilizing a combination of relation-centered and academic-centered approaches.

Boston University (BU) School of Medicine's Division of Graduate Medical Sciences began a credential-enhancing master's program in collaboration with BU Goldman School of Dental Medicine (GSDM) in 2005. Applicants to the MS in Oral Health Sciences (OHS) program seek to gain admission to dental school by demonstrating competence in a rigorous graduate curriculum. Many of these students have previously applied to dental school and not been successful in gaining admission. With a strong advising and mentoring system, students in the OHS program improve not only their credentials and academic readiness, but also their study and test taking skills, while gaining confidence in their ability to succeed in dental school.

The purpose of this preliminary study is to assess the success of a longitudinal peer mentor program currently in place in the OHS program. As in other peer mentoring programs, mentors work with underclassman or mentees across several components of their graduate education; however, a unique feature of our program is that mentees successful in gaining admission to GSDM transition to program mentors.

**Methods:** Current students attending BU's GSDM who graduated from the OHS program between 2010 and 2014 were surveyed. The survey was anonymous and questions addressed their experiences (i) as mentees in the OHS program and (ii) as DMD students serving mentors. Questions inquired on usage of resources as OHS students such as review sessions with teaching assistants, tutoring availability, as well as study skills and thesis panel sessions. Additionally, transition assistance to students entering OHS program was facilitated by DMD mentors before arriving to campus through means such as a class Facebook group, email and phone contact as well as once they arrive through contact at OHS orientation.

**Results:** A total of 28 OHS alumni currently students in GSDM were surveyed and 16 responded (57%). Responders included students matriculating to OHS in 2010 (n=2), 2011 (n=5), 2012 (n=3) and 2013 (n=6). A total of 38% of the incoming OHS students met with the Program Director and received a tour with alumni *i.e.* current GSDM students before orientation and felt it very helpful (82%). Participants viewed the use of a closed Facebook group (88%), the orientation lunch with alumni (93%) and the early study skills panel (87%) to be very informative and helpful however, only 55% of the OHS students found the weekly review sessions through the fall semester beneficial.

Alternatively, DMD students who responded as mentors reported that they had served as tutors (38%), as study tips (63%) or thesis (13%) panel participants, as admission's ambassadors by providing tours (56%) and/or as attendees of the orientation lunch (88%). Mentors serving as TA or tutors benefit from the opportunity to remain up to date on coursework in preparation for their Board exams. Open response comments overall were positive and mentors indicated that once an introduction is made in the beginning of the year, that informal mentoring continues throughout the year.

**Conclusion:** The results presented here demonstrate that the longitudinal cross-program mentoring model currently in place in the OHS program benefits both the mentee (OHS students) and the OHS alumni attending BU's GSDM (mentor). Students whom themselves received strong mentoring as an OHS graduate student continue to mentor as DMD students developing leadership skills that will serve them well later in their career. The development of both academic- and relationship- based mentoring opportunities at the DMD and MS level improves OHS student transitioning, social integration and community building while facilitating the development of confidence as well as skills to succeed academically.

## ADMISSIONS CRITERIA FOR SUCCESS IN CREDENTIAL ENHANCING PRE-DENTAL MASTERS PROGRAM

Theresa A. Davies, Ph.D., Department of Medical Sciences & Education, BUSM, GMS  
 Barbara Schreiber, Ph.D., Department of Biochemistry, BUSM  
 Yoona Choe, MS in Medical Sciences program, GMS  
 Cataldo Leone, D.M.D., Associate Dean, Departments of Periodontology & Molecular and Cell  
 Biology, BUGSDM

### **Abstract:**

#### **Purpose:**

Boston University (BU) School of Medicine's Division of Graduate Medical Sciences began a credential-enhancing master's program in collaboration with BU Goldman School of Dental Medicine in 2005. The ultimate goal of applicants to the MS in Oral Health Sciences (OHS) program is to gain admission to dental school by demonstrating competence in a rigorous graduate curriculum. The purpose of this study was (i) to evaluate the program's overall success with acceptance to dental school measured as the outcome and (ii) to determine which admissions criteria best predict success in the OHS master's program leading to acceptance to dental school.

#### **Methods:**

A total of 61 students were enrolled in the OHS program during the years 2010-2014. Undergraduate grade point average (UGPA), academic average Dental Admissions Test (DAT) scores, college attended, student performance in the OHS program measured as GPA (OHS-GPA) and acceptance to dental school were collected. Mean values of enrolled students' UGPA and OHS-GPA relative to their success measured as acceptance to dental school were compared by Mann-Whitney U Test and statistical significance was set at  $p < 0.05$ .

#### **Findings and Conclusion:**

The overall success rate of OHS graduates gaining acceptance to dental school was 93.4% from 2010-2014 ( $n=57/61$ ). Of these students  $71.8\% \pm 7.6$  had submitted a previous AADSAS application and were unsuccessful in gaining admission to dental school. Student performance in the OHS master's program was found to correlate with acceptance to dental school. OHS-GPAs for these students were  $3.53 \pm 0.12$  ( $n=57$ ). This value was significantly greater ( $p < 0.01$ ) than that observed in the cohort that did not gain admission to dental school ( $3.12 \pm 0.15$ ,  $n=4$ ). To better evaluate the factors contributing to enrolled students' lack of success in being admitted to dental school, UGPAs and admissions DAT scores were evaluated. Successful students' UGPAs were found to be higher than those of unsuccessful students ( $3.05 \pm 0.29$  ( $n=57$ ) vs  $2.85 \pm 0.47$  ( $n=4$ )) however this difference was not found to be significant ( $p=0.42$ ). Likewise, although DAT scores of students admitted to dental school were higher than those not admitted, the difference was not significant ( $18.5 \pm 1.58$  vs.  $16.25 \pm .03$ ; respectively;  $p=0.12$ ). Results suggest that BU's OHS credential-enhancing master's program is extremely successful, supported by the high percentage of graduates being accepted to dental school following completion of the program. Neither a student's DAT score nor UGPA were found to be significant predictors of success; however performance in the master's program was found to directly correlate with successful admission to dental school. A strong performance ( $GPA > 3.5$ ) in the OHS master's program was shown to correlate with successful dental school admission even though the majority had been denied admission to dental school prior to OHS. Future studies will continue to evaluate acceptance to dental school by evaluating additional admissions parameters such as school rank and repeat DAT score results following completion of the OHS curriculum. Moreover, dental school performance of OHS graduates is currently being evaluated.

## USE OF GAZE-TRACKING & EEG TO MEASURE SHORT- AND LONG-TERM LEARNING BY MEDICAL GROSS ANATOMY STUDENTS

Ala'a El-Shaar, B.S., Department of Anatomy & Neurobiology, BUSM

Corinne Nagle, M.A.T., Department of Anatomy & Neurobiology, BUSM

Michael Tat, PhD, Center for Translational Cognitive Neuroscience, VA Boston Healthcare System

Arjun Iyer, M.S., Department of Anatomy & Neuroscience, BUSM

Abenet Gherbmichael, M.S., Department of Anatomy & Neuroscience, BUSM

Bruno Frustace, M.S., Department of Anatomy & Neuroscience, BUSM

Edward Wang, B.S., BUSM

Sean Flannery, Center for Translational Cognitive Neuroscience, VA Boston Healthcare System

Andrew Budson, M.D., Center for Translational Cognitive Neuroscience, VA Boston Healthcare System

Ann Zumwalt Ph.D., Department of Anatomy & Neuroscience, BUSM

### ABSTRACT

The goal of medical educators is to teach their students in a manner that is effective for long-term, accurate knowledge retention, but measurement of long-term retention is difficult. In this study we combine gaze tracking and EEG to examine knowledge retention by these students. Medical gross anatomy students (n=22) were asked to identify anatomical structures displayed on a computer screen immediately following the gross anatomy course and again six months after the course ended. In this experiment the participants were instructed to visually fixate on the named structure of interest, or to indicate uncertainty by fixating on the upper left corner of the screen. Immediately after the course ended the students correctly fixated on the structures 70% of the time, incorrectly fixated 26.5% of the time, and indicated uncertainty 3.5% of the time. Preliminary results indicate that six months after the end of the course the students' performance at this task had not diminished (67% correct, 26% incorrect, 7% uncertain). However, the speed with which the students made their final decision was significantly longer 6 months after the course ended. The average time to identify the structure by fixating for the final time on the region of interest was 2.22s immediately after the course and 3.0s at the 6 month follow up ( $p < 0.001$ ). These results indicate that 6 months after the end of the course the subjects have solid knowledge retention but require more time to think before answering correctly. Visuospatial ability did not significantly correlated with speed to identify the structure ( $r = -0.279$ ; ns). Additionally, our results confirm that the students' correct behavioral responses of a task by visual fixation demonstrate signals associated with familiarity and recollection, 300-500 ms and 500-800ms post-stimulus onset respectively, on waveforms generated from EEG activity.

## IMPROVING KNOWLEDGE AND AWARENESS OF NON-PHARMACOLOGIC MANAGEMENT OF LABOR PAIN IN MEDICAL STUDENTS

Fernandes S, Vragovic O, Abbott JF

### **Study Objective:**

To assess knowledge and awareness of the non-pharmacological management of labor pain (NPM) in medical students after participating in an educational module

### **Methods:**

7/2013-5/2014, Boston University School of Medicine students viewed a PowerPoint presentation defining NPM and outlining techniques. Pre- and post-questionnaires analyzing NPM knowledge and awareness were collected. 4 groups of students participated and data from all 4 groups was combined; 68 students answered the pre-questionnaire and 62 the post.

### **Results:**

Students were asked to define NPM and provide their responses in multiple-choice format before and after participating in the module. In defining NPM, correct vs. incorrect responses were analyzed using the Chi-Square test via SAS 9.4 (SAS Institute, Inc., Carry, NC). Correct responses increased from 15% to 79%,  $p < 0.001$ . However, students' stated likelihood to support NPM over epidurals remained unchanged; they preferred offering epidurals considering them a common acceptable practice.

### **Conclusions:**

This educational module effectively defined NPM and outlined techniques but did not change students' self-assessment of their anticipated patient recommendations regarding labor pain management. The lack of traditional evidence-based-medicine influenced these responses. Of note, the module did not address students' ability to counsel patients who decline epidurals. A module, which incorporates these elements, could be used to evaluate changes in students' ability to counsel such patients. Our institution, as many do, has the resource of skilled certified nurse midwives incorporated into student experiences and their expertise could be employed to further develop this educational module.

### **Key Words:**

Non-pharmacological management, labor and delivery, educational interventions

## INTRODUCING CRITICAL THINKING STRATEGIES IN THE CLASSROOM

Neal Fleisher, DMD Department of General Dentistry, BUSDM

Critical thinking strategies are widely acknowledged as important skills for a health care professional. While increasingly emphasized as an essential component of current curricula in health related programs, often it is difficult for administration, faculty and students to clearly articulate what is meant by critical thinking.

A new elective course, *Current Topics in Dentistry* has been offered at BUSDM, a total of four times, beginning September 2014. This one semester course, uses controversial topics in dentistry to expose and teach students the concepts of critical thinking (Paul & Elder). The goal of the course is for students to learn a systematic method to apply critical thinking strategies to scientific review, patient diagnoses, treatment plan, and general application in most any situation calling for thoughtful assessment.

In preparation for a seminar session, the course uses a blog in which students each week must post a comment related to the topic question, and then reply to a colleagues comment, utilizing the principles of critical thinking.

In course evaluations, 100% of all students to date felt the course seminars helped them learn, and 100% either agreed or strongly agreed with the statement that the seminar cases were intellectually stimulating.

These teaching strategies can be imbedded within any number of courses, to illustrate and teach the fundamental universal concepts of critical thinking strategies.

# A CROSS-DISCIPLINE EVALUATION OF PRACTICE-BASED TEACHING: DESIGNING AND CONDUCTING AN EVALUATION OF INNOVATIVE TEACHING METHODOLOGY ACROSS MPH DISCIPLINES

Jacey Greece, BUSPH Community Health Sciences

## **Background:**

Accredited schools of public health (SPH) offering Masters in Public Health (MPH) degrees must meet competency requirements across five domains within the discipline. MPH programs should, like medical schools, incorporate opportunities for students to practice skills associated with competencies, as well as other workplace skills, in public health settings. Practice-based teaching (PBT) may provide those opportunities. Limited research has been done to measure the effectiveness of PBT within one discipline of public health, let alone across disciplines of public health.

## **Methods:**

A rigorous, multi-method evaluation was conducted for four MPH courses spanning three disciplines at the Boston University SPH. Guided by a logic model and evaluation plan, the pre-test post-test evaluation assesses short- and long-term goals of PBT, and specifically the competencies required by each course. Each course collaborated with different agencies. Data collection strategies included surveys of students and agency, key stakeholder interviews and focus groups, in-class observations of faculty, and document review of course materials.

## **Results:**

The pre-data being collected for Spring 2015 provides information on the technology being used by students, group work activities, communication strategies, learning style and career preparedness, team and leadership skills, community partner engagement, and specific course competencies. A post –test will assess similar aspects of learning at the end of the semester. Time investment by students and faculty is being collected. Results from both surveys will be analyzed to assess change over the course.

## **Conclusion:**

To be effective as public health practitioners, MPH students need opportunities to develop workplace skills in public health settings. PBT is an innovative teaching methodology that can build practical, multi-disciplinary skills for MPH students. This evaluation will examine the impact of PBT across disciplines and agencies and provide insight into student learning outcomes, best practices for faculty collaboration, and teaching practice across MPH disciplines.

## **BMC INTERNAL MEDICINE RESIDENCY CLINICAL EFFECTIVENESS REVIEW USING PANEL MANAGEMENT**

Gouri Gupte, PhD, BUSM, BUSPH, Health Policy and Management

### **Background:**

Reflection and review of patient care is one of the core principles of an internist. Patient care evaluation can help identify areas where care is less than optimal and implement changes to improve our practice.

### **Objective:**

Using the framework on panel management in the resident continuity clinic experience we created the ideal environment for residents to learn and implement practice improvement.

### **Methods:**

All categorical residents were required to complete a Panel Information Management (PIM) per academic year using a Qualtrics based worksheet and panel data supplied by the resident's clinic. The PIM focused on one relatively common chronic disease with easily identified treatment goals and national data to use as goals for care. Due to time constraints, the resident PIMs worked on shorter version of the ones used for Maintenance of Certification by the American Board of Internal Medicine. The first block (October 21<sup>st</sup>-November 15<sup>th</sup> 2013) residents measured data, reflected on their practice, and initiated a change in their practice. The second block (February 10<sup>th</sup>-March 7<sup>th</sup> 2014), residents are reflecting on the changes in their practice and assess the results.

### **Results:**

92 residents participated in the program (US Medical Graduates= 75; International Medical Graduates= 15), of which there were 40 females and 49 males (3 did not mention their gender). Settings included: Primary place of practice Shapiro (n=68), Veterans Affairs (n=3), Community Health Center (n= 18) and others. The program will end on April 15<sup>th</sup> when we will be able to provide more results on the engagement, panel improvement and the competency based assessment designed for the program.

### **Conclusion:**

This PIM program meets the Accreditation Council of Graduate Medical Education requirement for internal medicine residency training i.e. evaluation of performance data for each resident's continuity panel of patients relating to both chronic disease management and preventive health care.

## SOCIALLY RESPONSIBLE SURGEONS: SURGEONS AS LEADERS IN THE COORDINATION OF SYSTEMS BASED HEALTHCARE

Diane Haddad, Matt Fleming, Nichole Starr, Megan Janeway, Thiago Oliveira, Tyler Robinson, Doug Kauffman, Tracey Dechert

**Affiliations:** Socially Responsible Surgery; Boston Medical Center (BMC); Boston University School of Medicine (BUSM)

### Introduction:

The Accreditation Council for Graduate Medical Education (ACGME) has identified the understanding of systems-based practice as a core competency for general surgeons. The health of communities, especially in underserved areas, is affected by a confluence of social factors<sup>1</sup>. Surgeons respond to the effects of preventable injury and advanced disease exacerbated by conditions of poverty, poor housing, inadequate nutrition, violence, and substandard access to healthcare<sup>2</sup>. Socioeconomic and racial disparities lead to worse health outcomes for these marginalized patients<sup>3</sup>. Delivery of high quality healthcare capable of responding to the needs of these communities is essential. Educating surgeon leaders requires building a framework for surgical education in systems based socially responsible surgery.

### Methods:

Boston Medical Center is the largest safety net hospital in New England with a diverse patient population that is 70% underserved, including low-income patients and recent immigrants. We foster socially responsible systems practices to address the unique needs of our patients. We educate and empower students and physicians to serve as systems-based healthcare advocates, intervening at individual, community and policy levels. Working with multidisciplinary teams of social workers, community organizations, mental health providers, and others, surgeons champion solutions that improve the health of our communities.

### Results:

Boston Medical center has placed systems-based healthcare at the forefront of our recovery plans. Here, we describe three examples of programs utilized in the care of our surgical patients as models of socially responsible surgery.

1. **Community Violence Response Team (CVRT):** Violence has a harmful effect on both individuals and communities. The CVRT are mental health professionals who provide counseling to victims of violence and their family members at BMC, partnering with a hospital based violence intervention program. The team also educates medical students about breaking cycles of violence and injury prevention.

---

<sup>1</sup> US Burden of Disease Collaborators. The State of US Health, 1990-2010: Burden of Diseases, Injuries, and Risk Factors. *JAMA*.2013;310 (6):591-606. doi:10.1001/jama.2013.13805

<sup>2</sup> Schechter, Will P. et al. The Surgery of Poverty, *Current Problems in Surgery*, Volume 48, Issue 4, 228 - 280

<sup>3</sup> Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J. Socioeconomic Factors, Health Behaviors, and Mortality: Results from a Nationally Representative Prospective Study of US Adults. *JAMA*.1998;279 (21):1703-1708. doi:10.1001/jama.279.21.1703.

## **SNAAC COOKING DEMONSTRATIONS FOR MEDICAL STUDENTS: A DIRECT APPROACH TO TEACHING HEALTHY COOKING TO IMPROVE EATING HABITS**

David Hui, School of Medicine, BUSM

### **Background:**

Anecdotal evidence from Student Nutritional Awareness and Action Committee (SNAAC) members and Boston University (BU) medical students indicate that students have limited knowledge regarding healthy cooking and nutrition resulting in poor eating habits and a lack of confidence counseling patients about nutrition.

### **Objectives:**

To equip BU medical students with cooking skills and practical nutrition knowledge.

### **Methods:**

The SNAAC Cooking Demonstrations for Medical Students is an interactive lesson where SNAAC members teach fellow students how to cook a healthy meal. SNAAC lesson leaders hold six interactive cooking demonstrations overseen by Boston Medical Center's (BMC's) chef/registered dietitian over the course of the year. SNAAC leaders demonstrate how to prepare a nutritious, balanced meal. Participants learn cooking skills, and receive nutrition information and advice. During demonstrations, students ask questions, sample meals, and take home recipes. Participants complete an online evaluation after class.

### **Results:**

We received a total of 14 survey responses. 100% of responders agreed that they learned practical cooking tips and 92% of responders agreed that they increased their practical nutritional knowledge as a result of participating in the cooking demonstrations.

### **Discussion:**

BU medical students tend to neglect healthy eating habits and may not be poised to offer sound dietary advice as future physicians. These results show that BU medical students feel they benefit from participating in cooking demonstrations. These results also show that the demo kitchen can be an important tool for addressing medical student wellness.

### **Future Directions:**

SNAAC will continue collaborating with the BMC Demonstration Kitchen's chef/RD to maintain a program of 6 cooking lessons per academic year. Future research will be needed to see if cooking demonstration participants make lifestyle changes. Support from NFL grants (New Balance and Allen Foundation)

## CULTURAL COMPETENCY IN MEDICAL GENETICS EDUCATION: A DISCUSSION EXPLORING LGBT ASSISTED REPRODUCTION TECHNOLOGY

Helen Jin<sup>1</sup> and Shoumita Dasgupta<sup>2</sup>, Ph.D.

<sup>1</sup> Boston University School of Medicine

<sup>2</sup> Department of Medicine, Biomedical Genetics Section, Boston University School of Medicine

Social trends expanding the legalization of same-sex marriage have contributed to increasing numbers of same-sex couples raising children in the US<sup>4</sup>. Same-sex families have the opportunity to raise biologically-related children through assisted reproduction technology (ART), including options such as sperm donation, in-vitro fertilization (IVF), or gestational surrogacy. Since these options differ from infertility services for heterosexual couples, developing culturally competent educational materials for medical students about the lesbian, gay, bisexual, transgender and queer (LGBTQ) patient population is a critical strategy for minimizing LGBTQ health care disparities in this area. At Boston University School of Medicine, we developed a case discussion for the Medical Genetics curriculum to highlight the applications of ancestry-based genetic testing, donor testing, and ART in same-sex family planning and a survey to assess student attitudes about use of ART with both heterosexual and same-sex couples. We found that students with a family member or close friend who identifies as LGBTQ were significantly more likely than other students to disagree with the concept that healthcare access is equivalent for LGBT individuals and other members of the population. Furthermore, before class significantly fewer students recommended IVF for an infertile heterosexual couple (63%) than for a healthy lesbian couple (80%), but those numbers began to converge (67% and 73%, respectively) after the class discussion. While it may appear that a declining number of students recommended ART for the lesbian case, in fact, more students recommended sperm donation to a lesbian couple with fertility concerns after the class (51%) than before the class (33%). These initial findings highlight the importance of both personal experience with the LGBTQ community and the impact of educational interventions in addressing LGBTQ healthcare disparities.

---

<sup>4</sup> Gates, GJ. 2014. LGB Families and Relationships: Analyses of the 2013 National Health Interview Survey. Williams Institute, UCLA School of Law.

## **REACH: A SERVICE-LEARNING APPROACH TO IMPROVING INTERPERSONAL SKILLS AND COMMUNICATION BETWEEN MEDICAL STUDENTS AND MOMS EXPERIENCING HOMELESSNESS**

Emily Kemper BUSM 2018, Andrea Molina BUSM 2018, Jonathan Schouten BUSM 2018  
Tatiana Berger BUSM 2018, Jasmine Gandhi BUSM 2018

**R**esources and **E**ducation for **A**dolescents and their **C**hildren (REACH) is a student-run, service-learning program started in August 2013 at Boston University School of Medicine. This program arose from student recognition of the need for health education resources for homeless teenage mothers and their children. The program model involves REACH volunteers planning and teaching monthly health workshops in homeless shelters. Our goal was to evaluate the REACH experience as a tool for improving medical students' communication skills, interpersonal skills and teamwork. At the end of the year, volunteers completed a survey to assess the improvement of their own communication and interpersonal skills. A majority of volunteers, 68%, felt that having a better relationship with the mothers improved communication and improved the result of the workshop. Volunteers stated that at the beginning of the REACH experience they felt out of place, but now after having spent time with the moms and getting to know them better have felt more connected and better at presenting material to them. Most notably, on a scale out of 5, 100% of volunteers rated their level of comfort presenting health workshops as 3 or higher by the end of the year, with 47% of volunteers rating themselves as "Very Comfortable," the highest rating. This shows that, by self-report, after a year of REACH, volunteers have an understanding of how to utilize interpersonal skills to communicate more effectively, and they feel able to present health information as an expert. These are skills that volunteers will continue to enhance as medical students and will benefit them greatly as physicians.

## PERCEPTION OF DIFFERENCES IN ORAL HEALTH QUALITY OF LIFE BETWEEN PARENTS AND TEENS

Jeongyun Kim, Raffi Miller, Sharron Rich, Leslie Will, Wanda Wright, Judith Jones

This project was funded by NIH/NIDCR grants U54 DE014264, U54 DE019275, K24 DE000419, and K24 DE018211.

### **Objective:**

The objective of this study is to ascertain the similarities and differences in the teen and parent responses to oral health quality of life surveys pertaining to orthodontic and dental issues for teen patients.

### **Methods:**

This study was approved by the Boston University Medical Campus IRB. Patients ages 10-18 were recruited from the Orthodontic clinic at Boston University School of Dental Medicine. Teen patients and parents were asked to complete the Teen Oral Health Quality of Life (TOQOL) and PedsQL surveys, and the teen's malocclusion was classified according to the Index of Orthodontic Treatment Need (IOTN).

### **Results:**

Surveys were obtained from 164 teen-parent pairs with a mean age of teen patients of 13 years. The subjects were from diverse ethnic and racial backgrounds, and 51% were male. Subjects were grouped by IOTN classification, with 58.5% having mild-moderate malocclusion (IOTN score 2 or 3) versus 41.5% with severe malocclusion (IOTN score 4 or 5). Teens reported significantly higher scores, correlating to lower quality of life, in the Oral Health Problems and Physical domains of the TOQOL, while parents reported significantly lower scores, correlating to lower quality of life, in the PedsQL measure of general quality of life. Agreement between teen and parent reporting of the Esthetic Component of the IOTN was calculated with a kappa score of  $K\pm 1 = .5043$ , showing moderate correlation between parents and teens on their perception of the teens' esthetics.

### **Conclusions:**

Teens and parents show moderate agreement when evaluating esthetic implications of malocclusion, but show significant differences in reporting the teens' oral problems related to malocclusion, with parents not being reliable reports of teen oral health problems.

Key words: Quality of life, orthodontics, parent-report, teen self-report

## PHYSIOLOGICAL CORRELATES OF MEMORY IN A CLASSROOM ENVIRONMENT

Corinne Nagle, Michael Tat, Bruno Frustace, Ala'a El-Shaar, Rebecca Deason, Arjun Iyer, Abinet Gherbmichael, Edward Wang, Sean Flannery, Andrew E. Budson, and Ann Zumwalt.

The science of learning and memory has been well studied within the confines of laboratory environments, but fewer investigations have attempted to apply these principles into educational practice. Elucidating the memorial mechanisms used by students may provide a potential way to improve student performance within educational settings. The current study uses event-related potentials (ERPs) to investigate the memorial processes used by students during retrieval of content learned in the classroom. Thirty-one medical students from a gross anatomy course completed a computer-based memory task at three time points: prior to the course (session 1), after the completion of the course (session 2) and six months later (session 3). Students were presented with anatomical terms from the course and were asked to respond as to whether they "Can Define", are "Familiar" or "Don't Know" each term. Preliminary ERP data revealed that "Can Define" and "Familiar" responses elicited a mid-frontal effect 300-500 milliseconds post-stimulus onset, typically thought to reflect a memorial familiarity process. A late frontal effect (LFE), maximal for "Familiar" terms, was observed over frontal electrodes thought to reflect post-retrieval processing. These results suggest that basic memorial mechanisms may be predictive of student retention of course content.

## **SOCIALLY RESPONSIBLE SURGERY: DEVELOPING RESEARCH AND TRAINING OPPORTUNITIES TO ADDRESS SURGICAL DISPARITIES IN UNDERSERVED POPULATIONS**

Thiago M. Oliveira, Tyler D. Robinson, Matt Fleming, Diane Haddad, Megan Janeway, Nichole Starr, Douglas Kauffman, PhD, Tracey Dechert, MD.

### **Introduction**

We define “Socially Responsible Surgeons” as leaders who: (1) provide necessary surgical care to patients from underserved populations; and (2) have meaningful population-level impact through both public health and system-based interventions. There exists a need to develop formalized research and training opportunities to meet the growing enthusiasm amongst surgeons, surgical residents, and medical students to develop their practice as socially responsible surgeons. Socially Responsible Surgery unifies global surgery, rural surgery, and urban surgery by its mission to provide quality surgical care to underserved populations.

### **Methods**

The Department of Surgery at Boston Medical Center and the Boston University School of Medicine surgical interest group have developed a successful program that pairs medical students with residents and faculty by research interests. Within this program, we are introducing an additional research track in “Socially Responsible Surgery.” This track will formalize research and training opportunities, and develop a community of surgeons and trainees at our hospital committed to addressing social barriers to surgical care.

### **Results**

We will measure

- (a) medical student, resident, and faculty interest in Socially Responsible Surgery projects before and after the establishment of an established track; and
- (b) medical student, resident, and faculty engagement (total number of projects, projects per individual, projects per level of training) in Socially Responsible Surgery projects before and after the establishment of an established track.

Our future goals include seeking partnership with the Boston University School of Public Health to develop course curricula to address surgical disease at a community level; we hope this will eventually lead to Fellowship offerings for surgical residents interested in Socially Responsible Surgery.

## BEYOND THE CLASSROOM: MEDICAL STUDENT NUTRITION EDUCATION THROUGH GARDENING AND COOKING DEMONSTRATIONS

Joseph S. Park\*, David J. Park\*, Iris M. Trutzer, Sean Burns, Krystyne Basa.

\*Authors contributed equally.

Boston University School of Medicine, Class of 2017

### **Background:**

Anecdotal evidence suggests that medical school is an environment that causes medical students to neglect nutrition. Because a healthy diet is a major component of wellbeing, advocacy of medical student nutrition has been a goal of the student nutrition group, SNAAC. The Medical Student Residence (MSR) garden, instated in 2013, has served as an interactive tool to learn about fresh organic produce through hands-on gardening, while cooking demonstrations have helped students learn how to use those products appropriately.

### **Objectives:**

- 1) To understand what the barriers are to nutrition among medical students.
- 2) To teach the uses of a variety of fresh produce through hands-on gardening.
- 3) To teach basic skills of cooking that may successfully incorporate fresh produce procured from the garden.

### **Methods:**

In summer 2014, students and medical faculty gathered to plant more than 35 types of fruits and vegetables in the MSR garden. Medical students were then able to access the garden and pick their own produce throughout the year. SNAAC hosted a 30-minute cooking demonstration event in September to connect garden produce to basic cooking concepts using the USDA “Choose My Plate” framework. Anonymous surveys were given at exit.

### **Results:**

There was consensus that lack of time and confidence in cooking were the barriers to healthy eating. Students expressed keen interest in the gardening resource, although utilization data was not collected. Promisingly, most students agreed (11 out of 13, 85%) that the cooking demos made them more confident in their “ability to cook healthy meals.”

### **Discussion:**

Gardening and cooking demonstrations enhance medical students’ wellbeing and are instrumental in their learning about nutrition. As future healthcare providers, medical students ought to be concerned with nutrition, to better counsel their patients. Funding provided by the Office of the Dean and OSA Wellness Program.

## NUTRITION EDUCATION IN HIGH SCHOOL STUDENTS THROUGH A SNAAC-LED INTERVENTION

Joseph S. Park\*, David J. Park\*, Iris M. Trutzer, Sean Burns, Krystyne Basa.

\*Authors contributed equally.

Boston University School of Medicine, Class of 2017

### **Background:**

Adolescence is a period of vulnerability to major social and economic forces, with formation of behaviors that may persist well into adulthood. Nutrition education in high school may help shape positive diet habits. Such intervention may be timely and effective in counteracting the growing rate of US adolescent obesity. In the fall 2014, medical students in Student Nutrition Awareness and Action Council (SNAAC) designed a brief nutrition educational intervention targeting high school students.

### **Objectives:**

Participants were to be able to:

- 1) Identify the macronutrient groups (i.e. protein, carbohydrates, fat) comprising diet;
- 2) Recognize the importance of breakfast;
- 3) Critically evaluate food labels; and
- 4) Understand meal portions.

### **Methods:**

Medical students devised and ran a 1-hour, four-part session in which 16 Boston high school students enrolled through the local Science Teaching Enrichment Program (STEP). Modules were tailored to the above objectives and were interactive: for example, sample food labels of popular cereals were scrutinized and a pizza-building exercise was used to demonstrate portion sizing. Registered dietitians (RDs) were present throughout the intervention. At conclusion, participants were given anonymous surveys to evaluate the effectiveness of the modules.

### **Results:**

62% agreed that they had a better understanding of the concept of macronutrients. 56% consented to the importance of eating breakfast. 81% agreed that they felt more confident in reading food labels as a basis to judge the nutritious content of foods. 94% agreed that they better understood portion control.

### **Discussion:**

Based on the survey data, the intervention was successful in teaching core nutrition topics to the majority of participants; the food label interpretation and portion control modules were most effective. Interactive SNAAC-led interventions may prove as an effective vehicle for conveying pertinent topics in nutrition to high school students.

## INTERNAL MEDICINE RESIDENTS' BELIEFS ABOUT OBESITY AND ITS TREATMENT IN THE PRIMARY CARE SETTING

Jennifer A. Russo, M.D. Department of Medicine

### Needs and objectives

Little is known about internal medicine residents' attitudes and knowledge regarding obesity and appropriate treatments. We conducted a needs-assessment survey of internal medicine residents to better ascertain residents' current beliefs regarding obesity and to identify gaps in confidence and medical knowledge related to the treatment of patients with obesity. The information gathered was utilized to inform an educational intervention to enhance the clinical skill set and knowledge base of internal medicine residents.

### Setting and participants

The study was conducted in an urban academic medical center in Boston. Participants included categorical and primary care residents in an internal medicine residency program.

### Description of the program/intervention

A voluntary, anonymous, paper-based survey was offered to all categorical internal medicine residents at Boston Medical Center during a routine educational conference. The needs-assessment was constructed from a previously validated survey with minor modifications made to better address our specific research question. Based on results, an educational intervention was designed to address areas of lower confidence. A post-intervention survey will be conducted to determine if the residents' confidence, attitudes, and utilization of evidence-based treatments and appropriate referrals have changed.

### Evaluation-measures of success

Of the 74% (n= 81) of internal medicine residents who have responded to the survey, all (100%) agree that obesity is a chronic medical disease associated with serious medical conditions. Only one-fourth of residents (25.9%) believe that patients with obesity are aware of the health risks of remaining obese. Currently, the majority of residents (69.7%) feel they are unsuccessful with helping obese patients lose weight. Less than a third (30.0%) recommend weight loss routinely for their primary care clinic patients with obesity. Residents report the lowest confidence levels (14.8%) with prescribing medications for weight loss. With the results of the needs-assessment, we designed an educational intervention to target the residents' self-reported limitations and perceived ineffectuality of the treatment of patients with obesity. A post-intervention survey will be conducted to evaluate if the educational intervention increased residents' confidence and utilization of evidence-based treatments and appropriate referrals within their primary care clinics.

### Discussion/reflection/lessons learned

Our needs-assessment reveals that while all residents agreed that obesity is a chronic medical disease associated with serious medical conditions, the majority do not counsel their primary care patients on the management and treatment of their obesity. Many residents report low confidence in the utility of their own counseling skills and knowledge regarding treatments which likely contributes to the lack of self-reported patient interventions. Residents may benefit from educational interventions to both promote the usefulness of effective counseling as well as to increase confidence utilizing evidence-based treatments and referrals.

## **DIETETIC INTERNS EDUCATING FUTURE PHYSICIANS ABOUT THE ROLE OF THE REGISTERED DIETITIAN AND MEDICAL NUTRITION THERAPY IN PATIENT CARE**

Joan Salge Blake, MS, RD, LDN, FAND, Laura Judd, MS, RD, LDN, Carine, Lenders, MD, MS, ScD, Kathy Ireland, MS, RD, LDN, Hannah Milch, MD, Ashley Decker, MD, A., Nanette Harvey, MD, Lorraine Stanfield, MD, Aimee Lim-Miller, MD, Sharon Levine, MD, Sean Burns, Krystyne Basa, Joshua Mervis, and Jane Qu

### **Learning Outcome:**

To assess the impact of educating medical school students by dietetic interns regarding the role of registered dietitians nutritionists (RDN) and the importance of medical nutrition therapy (MNT) in the treatment of chronic disease prevention and management.

Few medical schools offer curriculum regarding medical nutrition therapy (MNT) and education regarding the role of RDN in chronic disease prevention and management. To better educate Boston University School of Medicine medical students (BUSMS) about MNT and the role of RDN as part of the healthcare team, an IRB-approved, research project was created. Over the four-week program, a current BU dietetic intern (BUDI) was matched with a BUSMS to participate in educational activities. The activities included: the BUDI counseling the BUSMS on his/her diet; a grocery store tour; the BUSMS learning how to extrapolate diet information from patients; and a collaborative BUDI/BUSMS nutrition-based case study presentation. At the completion of the program, a survey was administered to both the BUSMS and BUDI. The results showed that the program led to an increased understanding by the BUSMS of the role RDN play in MNT, while the BUDI honed their outpatient counseling skills and expanded their professional network. The positive survey results along with an extensive description of the program will be shared.

These findings could initiate similar DI/MS education programs in an effort to not only educate future physicians as to the role of RDN in patient care but to also forge collaborations between RDN and physicians.

## A PROSPECTIVE CONTROLLED STUDY USING PRE- AND POST-TESTING TO EVALUATE THE AMBULATORY SUBSPECIALTY CURRICULUM IN 3+1 MODEL OF INTERNAL MEDICINE RESIDENCY

Mayank Sardana, MBBS, Sheilah Bernard, MD, FACC

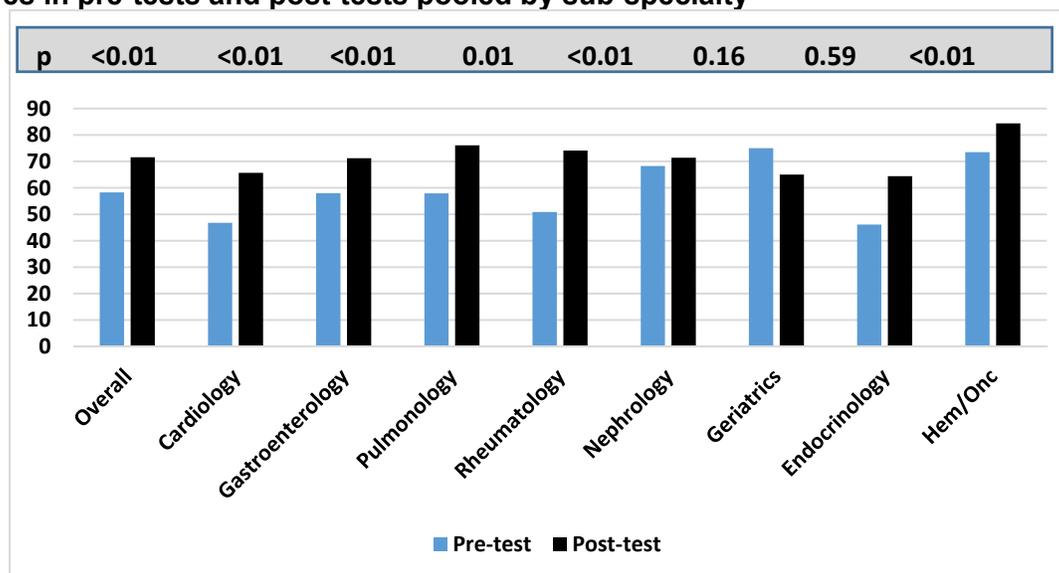
**Purpose:** The Internal Medicine Residency program at Boston Medical Center adopted 3+1 schedule in 2009, creating one week of ambulatory subspecialty experience every fourth week. Multiple programs across the nation have adopted similar models, but efficacy of teaching in this curriculum needs assessment. We present results from first of its kind objective assessment of our ambulatory subspecialty curriculum in this new model.

**Methods:** From July, 2013 to February, 2015, every second and third year resident was given a pre-test with multiple choice questions (similar to ABIM Internal Medicine Boards Exam format) just prior to the sub-specialty lecture, whereas the post-test was given four weeks later. Teaching content of the lectures was modified based on residents' performance in In-Training Exams (ITE) and new areas of focus. Also, lecturers were provided with feedback based on results from pre- and post-tests. To get real-time assessment, no incentives or special instructions were provided after first lecture and data from first two blocks was excluded in analysis.

**Results:** Over study duration, ninety residents completed total of 19 subspecialty teaching blocks. Pre- and post- test data was available for 16 of these blocks. On performing paired and unpaired t-test analysis of 1079 test scores, mean scores improved significantly ( $p < 0.05$ ) from pre-tests to post-tests in 9 subspecialty blocks. On pooling the data from all blocks for individual subspecialties, similar results were seen across all subspecialties, except Nephrology, Hematology and Geriatrics (low sample size).

**Conclusions:** Pre and post-testing is effective at evaluating the ambulatory subspecialty curriculum and to identify areas requiring extra emphasis. These methods should be used to assess and modify the curriculum with a goal to better prepare residents for ABIM certification exam. There is potential role for similar low-maintenance and cost-efficient assessment methods across all curricula in UME, GME and CME, as the benefits were consistent over the duration of the study.

### Mean scores in pre-tests and post-tests pooled by sub-specialty



### Mean scores in pre- and post-tests

	Mean score	Std. Deviation	N
Pre-test	58.38%	27.51%	618
Post-test	71.68%	25.17%	461

## IMPLEMENTATION OF A BUSM STUDENT-LED SERVICE-LEARNING INITIATIVE, PUMPSTART: CPR EDUCATION FOR INNER-CITY HIGH SCHOOL STUDENTS

Nikita Saxena, BUSM '18, Pooja Shah, BUSM '18, Anita Knopov, BUSM '18, Clare Eichinger, BUSM '18, Victoria Fox, BUSM '18, Kevin Wilson, BUSM '18, Ricky Kue, MD, MPH, Department of Emergency Medicine, BUSM

### **Objective:**

To describe the implementation and perceived effectiveness of a medical student-led, CPR training program for local inner-city high school students. Our goal was to provide BUSM students the opportunity to teach layperson CPR while mentoring younger students.

### **Background:**

After seeing lack of exposure to healthcare fields and basic medical knowledge among inner-city high schoolers, we sought to close this gap through a cardiopulmonary resuscitation (CPR) initiative: PumpStart, utilizing the American Heart Association's "Family & Friends CPR Anytime" curriculum. PumpStart's goal was to empower students with CPR skills they may not otherwise receive, expose students to the healthcare field by connecting them with BUSM medical students as mentors and role models, and provide medical students skills in effective leadership and mentoring. The program was piloted in Spring 2015 at City on a Hill School in Roxbury, MA.

### **Methods:**

Weekly one-hour sessions were taught utilizing video instruction and supplemental hands-on practice led by BUSM volunteers. Anonymous pre- and post-session questionnaires for quality improvement were administered to gauge students' comfort performing CPR, feelings surrounding the importance of CPR and knowledge of CPR facts.

### **Results:**

Forty-six high schoolers have completed PumpStart to date, with 85% (39/46) reporting no prior CPR training. After the session, 83% (38/46) of students reported that they felt comfortable/very comfortable performing CPR compared to 40% (18/46) prior to the class. 89% of the students scored above 71% on the seven-question objective post-assessment.

### **Discussion:**

This service-learning pilot project was a positive learning experience for volunteers and high school students alike. By the end of each session, all students said they would be willing to share their newly acquired knowledge with friends/family. Our initial observations suggest that PumpStart is successful in teaching basic CPR skills and importance. PumpStart shows great potential for continued growth in upcoming years.

## ONLINE LEARNING MODULES TO PROMOTE INTERDISCIPLINARY, CASE-BASED LEARNING

Liz Faye, MPH - Liam Hunt, MPS - Wayne LaMorte, MD, PhD, MPH - Rob Schadt, EdD  
Office of Teaching and Digital Learning, BUSPH

### Introduction

Educators increasingly face three major challenges:

1. Facilitate student-centered, active learning.
2. Present an organized view of an ever-growing body of disciplinary content as a coherent whole.
3. Promote and model an interdisciplinary perspective to enable students to address complex, real-world problems despite the tendency for academic departments to function as self-contained silos.

### Goals

Our learning modules are designed to enhance:

- Accessibility
- Student engagement
- Active learning
- Feedback
- Integration across disciplines
- Rigor, skill development, and critical thinking
- Support of different learning styles

### Methods

Our masters program in public health is developing three types of online learning modules to supplement face-to-face teaching and foster development of active learning with an interdisciplinary perspective.

1. Case studies of complex public health problems to provide an engaging interdisciplinary focus for an integrated core course curriculum that includes courses in epidemiology, biostatistics, environmental health and health law.
2. Interactive online learning modules to clarify concepts and to support specific courses.
3. General skill-focused modules, e.g., working in teams, writing skills, using spreadsheets

We developed a model for online learning modules using SoftChalk®, a user-friendly software providing easy navigation, incorporation of multimedia content, external links, and a variety of engaging types of activities providing instant feedback.

### Results

Anonymous course evaluation from core epidemiology course: 92% either agreed (32%) or strongly agreed (60%) that the modules are a significant aid to learning.

- "...the learning modules are so comprehensive! Weekly pre-class and post-class problem sets were VERY helpful in solidifying concepts. This class is designed for you to succeed."
- "Online modules were excellent! They were interactive and provided me with strong foundation for the material. Although it was a lot of work, the pre and post quizzes strongly reinforced material learned in class. Additionally, the pre-quizzes motivated me to read the modules before class."
- "I really enjoyed the use of online modules as a preview for what was to come in class. The reiteration online and then in person contributed to having the knowledge 'stick'."

### Summary/Discussion

The online cases and learning modules can:

- Increase student satisfaction with the instructional program.
- Created an accessible learning resource
- Enhanced the breadth and depth of the core courses and elevated the rigor with which they are taught
- Provided a means of integrating the core curriculum across departments
- Provide a vehicle to promote faculty collaboration across departments
- Serve the global community

### Challenges Moving Forward

- Time and resources for meeting increasing demands for online modules
- Developing a standardized process for the preparation and development of modules
- Regularly scheduled "maintenance" of modules
- (Keeping the modules current with scientific developments and relevant events
- Managing compatibility with platforms, media players and mobile devices
- Identifying and collaborating with Subject Matter Experts
- Assuring ADA compliance

## A BREASTFEEDING MEDICINE ELECTIVE FOR BUSM-IV STUDENTS

Miriam Segura-Harrison, BUSM 2015.

**Background and Description:** Medical students at BUSM currently have limited clinical experience working directly with the breastfeeding mother/infant dyad in supporting breastfeeding and assisting with management of common breastfeeding problems. We designed the Breastfeeding Medicine elective to provide a blended learning experience of an online module, (the Wellstart lactation curriculum), combined with clinical experiences supporting the breastfeeding mother/infant dyad and formulating breastfeeding management plans in a variety of outpatient and community settings.

**Methods:** We examined breastfeeding electives at several US medical schools and at one residency program and identified key educational elements of a successful medical student breastfeeding learning experience. We decided to focus on several key domains: building a solid knowledge base in lactation before patient contact, exposure to a variety of outpatient and community breastfeeding experiences, formulation of clinical questions and evidence-based plans for patients, and understanding of the role of community breastfeeding support in the context of health promotion and community advocacy. We identified a convenient, cost-effective curriculum to build basic knowledge in lactation. We then identified institutional and local breastfeeding learning experiences in the community and engaged key contact persons to generate interest in having medical students rotate at community breastfeeding support sites. We then drafted learning objectives and curricular elements, including an advisory structure, required diagnoses, an evidence-based case presentation project, and reading assignments. We then drafted a course outline and syllabus and presented the Breastfeeding Medicine Elective to the Elective Clerkship Subcommittee.

**Results:** This elective was approved by the Elective Clerkship Subcommittee on 3/25 and will proceed to the Medical Education Committee on 4/9.

**Discussion:** If approved, this elective will be the first in-depth, stand-alone elective focusing on the care of the breastfeeding mother/infant dyad at the Boston University School of Medicine. Boston Medical Center has a long tradition of supporting the breastfeeding mother/infant dyad, and has been certified as a Baby Friendly Hospital since 1999, the first hospital in MA to obtain such certification. Preliminary demand for this elective already exceeds 5 students for the upcoming year. Students interested in OB/Gyn, Family Medicine, or Pediatrics are a natural audience for the information and skills which will be imparted through this elective, but any future physician who wishes to attain greater comfort, confidence, and skill in the care of breastfeeding mothers and their infants can benefit from this elective. We look forward to implementing this novel elective for the 2015-2016 academic year.

## A MULTIDISCIPLINARY APPROACH TO EVIDENCE-BASED LUNG NODULE EVALUATION

Jason Sherer, BUSM

### **Introduction:**

Boston Medical Center (BMC) is an urban safety-net hospital that, prior to the establishment of the BMC Lung Nodule Clinic (LNC) in July 2014, had no standardize process for clinic follow up of pulmonary nodules. Studies show 20-30% of lung cancers initially present as incidental pulmonary nodules and despite recommendations from the National Comprehensive Cancer network and Fleischner Society, patients still receive care inconsistent with guidelines. The BMC LNC was established as a resource to provide prompt evidence-based evaluation and treatment plans for pulmonary nodules.

### **Methods:**

We reviewed the medical records of patients referred to the BMC LNC from July 2014 to January 2015. Clinic volume, no show rates, patient demographics, nodule size, recommendation made from clinic, adherence to initial recommendation, referral source, PCP practice location, and lung cancer diagnosis with staging were recorded.

### **Results/Outcomes:**

A total of 101 appointments were made for LNC in the first 7 months. There was an equal distribution of new patients referred for nodules sized  $\leq 4\text{mm}$ , 4-6mm, and  $>8\text{mm}$ . There were 58 new and 20 follow up appointments with a total of 53 radiological test ordered and 13 referrals to the Thoracic Oncology Clinic for new to LNC patients. The analysis demonstrates the feasibility of a multi-disciplinary approach to evidence-based lung nodule care, its potential as a revenue source, and the need for additional support via nurse practitioner and patient navigator to support clinical follow up and contact patients for appointments.

## **EVALUATING BASELINE LEARNER ENTITLEMENT; RESULTS OF A VOLUNTEER SURVEY OF CURRENT MEDICAL STUDENTS**

John N. Smith, BUSM, MD candidate 2016

### **Background:**

In the 1986 NEJM article “Coping with Entitlement in Medical Education” Dr. Steven Dubovsky of the University of Colorado School of Medicine described an increasing “dishonesty, greed, cynicism, narcissism, and a lack of independent thinking” among medical students. He went on to describe five salient characteristics of what he termed an “entitled” medical student. His article was met with widespread disagreement in the form of multiple Letters-to-the-Editor, but he could find no other such evaluations or descriptions of entitlement among medical students published in the medical literature (Dubovsky, 1986).

However, the notion of academic entitlement is richly described in the psychological literature, most commonly with subjects enrolled in entry-level psychology courses at large undergraduate institutions. One such assessment validated a vignette-based survey that evaluated inappropriate student behaviors regarding academic entitlement (Chowning and Campbell, 2009). The vignettes combine elements of entitlement with pertinent areas of the academic domain.

### **Aims**

We aim to describe baseline characteristics of entitled student behavior (or not) among different class years, gender, and ages at BUSM. Subjects will first react to five statements of entitlement before then reacting to a short vignette adapted from the study by Chowning and Campbell, 2009. In administering this survey we hope to establish a foundation of the concept of learner entitlement in medical education for future exploration. A secondary aim is to generate curiosity and dialogue about current attitudes regarding education within medical school culture.

### **Methods**

Anonymous subject responses to a voluntary IRB-approved survey will be recorded. Responses to the five statements of entitlement will be measured on a 5-point likert scale. An example of a survey prompt is “I am entitled to give an unfiltered and/or critical opinion when I feel a course instructor has failed to live up to their duty”. We will obtain basic demographics of gender, class year, and prior degree or career to run separate additional analyses.

Subjects will read a short vignette about mandatory class attendance. The vignette is followed by 6 possible reactions; 3 that are inappropriate and 3 that are appropriate. Subjects first rate the “likelihood” of having each reaction (5-point scale) and then rate each reaction according to its “appropriateness” (5-point scale). Subject responses produce four scores: student ratings of likelihood of inappropriate reactions, ratings of likelihood of appropriate reactions, ratings of appropriateness of appropriate reactions, and ratings of inappropriateness of inappropriate reactions. High ratings of likelihood of inappropriate reactions or inability to identify inappropriate reactions are associated with predicting entitled behavior in the 2009 Chowning and Campbell study.

### **Results:**

None to date. Pending results of survey.

### **Summary/Discussion:**

Pending results of survey. Discussion will aim to describe how valid or generalizable the survey responses are to the BUSM student body. Further discussion will aim to suggest future studies to further elucidate any significant or surprising findings. Discussion may also touch on the multiple reasons that could be cause for entitled/not entitled behaviors among medical students.

## **COMPARING THE IMPACT OF AN ONLINE MODULE TO FACULTY FEEDBACK SESSIONS ON STUDENTS' ORAL PRESENTATIONS: A MULTI-CENTER RANDOMIZED CONTROLLED TRIAL.**

Colin M. Sox, MD, MS, Department of Pediatrics, BU School of Medicine, Boston, MA;  
Linda O. Lewin, MD, Department of Pediatrics, Univ. of Maryland School of Medicine, Baltimore, MD;  
Rebecca Tenney-Soeiro, MD, MEd & Jeanine Ronan, MD, MEd, Department of Pediatrics,  
The Perelman School of Medicine & University of Pennsylvania & The Children's Hospital of  
Philadelphia, Philadelphia, PA; Rachel Thompson MD, Department of Pediatrics, Boston  
University School of Medicine, Boston, MA; Mary Brown MD, MS, Department of Pediatrics, Tufts  
University School of Medicine & Floating Hospital for Children, Boston, MA; Marta King, MD,  
MEd & Jamie S. Sutherell, MD, Department of Pediatrics, St. Louis University School of  
Medicine, St. Louis, MO; Michelle Noelck, MD, Department of Pediatrics, Oregon Health &  
Science University, Portland, OR; Michael Dell, MD, Department of Pediatrics, Case Western  
Reserve University School of Medicine, Cleveland, OH.

### **Background:**

Faculty-led feedback sessions during pediatric clerkships can improve students' subsequent oral presentations. The effectiveness of a self-directed web-based CLIPP oral presentation module is unknown. We sought to determine if the CLIPP presentation module is more effective at improving students' oral presentations during pediatric clerkships than either (1) faculty-led feedback sessions or (2) no intervention.

### **Methods:**

We conducted a single-blinded cluster randomized controlled trial among medical students rotating in pediatric clerkships at 7 U.S. medical schools over a 12-month period. Blocks of students were randomly assigned to 1 of 3 study-arms: (1) CLIPP, (2) Feedback, and (3) Control. During the clerkship's first 2 weeks, (1) CLIPP subjects were required to complete the on-line CLIPP presentation module and (2) small groups of Feedback subjects received feedback from faculty after delivering presentations; Controls did neither. At clerkship end, (I) the overall quality of students' oral presentations was assessed by faculty blinded to randomization status, and (II) subjects reported whether the ability to deliver presentations improved during the clerkship. We conducted multivariate (I) linear and (II) logistic regressions clustered on block while controlling for group and school.

### **Results:**

The 785 subjects were evenly distributed between the CLIPP (# = 259), Feedback (260), and Control (266) groups. Presentation quality was significantly higher in the CLIPP group than the Control group (coefficient: 0.29; 95% CI: 0.04, 0.54), but did not differ between the CLIPP and Feedback groups (coeff: 0.06; 95% CI: -0.17, 0.29). Self-reported presentation skill did not differ between the CLIPP and Control [Odds Ratio (OR): 0.61; 95% CI: 0.33, 1.12] nor the CLIPP and Feedback groups (OR: 0.71; 95% CI: 0.39, 1.29).

### **Conclusion:**

The self-directed web-based CLIPP presentation module significantly improved the faculty-rated quality of students' oral case presentations. Schools should consider requiring students to complete the CLIPP presentation module during pediatric clerkships.

## INTER-PROFESSIONAL EDUCATION MODEL FEATURING RISING MS2S AND PAS1S

Jordan Sukys, BA and Mary Warner, MMSc, PA-C, Physician Assistant Program, BUSM

### **Purpose:**

To assess the effectiveness of an inter-professional education model featuring rising second year medical students (MS2s) and first year physician assistant (PA) students (PAS1s).

### **Methods:**

A PA Education Fellowship was developed to assist cultural and academic assimilation of PAS1s into a new PA Program at Boston University. PA Education Fellows (PAEF) were selected from a pool of rising MS2 candidates. PAEF participated in many elements of the curriculum including: facilitating small group review sessions, assisting in anatomy lab, and participating in weekly journal clubs with faculty to discuss medical education. Evaluation of this fellowship was conducted via an anonymous survey distributed to PAS1s after conclusion of the 1<sup>st</sup> semester of PA school. Responses were analyzed using descriptive statistics with data reported in aggregate.

### **Results:**

All PAS1s described their experience with the PAEF as positive or very positive. PAS1s agreed that the PAEF fit into a unique educational role as peer mentors and felt comfortable asking the PAEF questions they might not otherwise ask a professor. The most significant impact from the PAEF came from mentorship regarding study strategies, lecture/lab content and background scientific knowledge.

### **Conclusion:**

The PA Education Fellows fit into a unique educational role, providing mentorship and accessible instruction from similarly aged and experienced peers who had recently completed a similar curriculum. Working with rising 2<sup>nd</sup> year medical students provided 1<sup>st</sup> year PA students with meaningful early inter-professional experience.

## HOMELESS HEALTHCARE CURRICULUM: INTEGRATION INTO EXPERIENCE-BASED SERVICE LEARNING

Tess Timmes, Jaime Stull, Veronica Faller, Laura Ha, Cassandra Parker, Stephen Reese, Rauvynne Sangara, Elizabeth Wilson

### **Problem statement:**

A study at UCSF reports a homeless health curriculum is necessary for addressing unique population needs, and effective in improving medical students' knowledge.<sup>1</sup> Homeless Health Immersion Experience (HHIE) and Outreach Van Project (OVP) students both work with homeless individuals but lack partnership and a formalized curriculum in homeless healthcare foundations.

### **Objectives:**

1. Partner HHIE and OVP.
2. Equip students with knowledge, resources, and attitudes necessary to assess and advocate for homeless patients' needs.

### **Description of intervention:**

The two-year Homeless Healthcare Curriculum, developed through HHIE and OVP partnership, integrates monthly classes, community outreach, and reflection into experiential service learning. First year classes provide foundations in social determinants of health. The second year includes case-based lectures aligned with DRx modules.

### **Methods:**

Student leaders and physician mentors created the curriculum layout and goals. Student leaders met monthly to organize upcoming classes and outreach events, and OVP and HHIE students attended classes together. Twice a year, student leaders facilitated joint reflections. Students completed evaluations upon curriculum completion.

### **Results:**

Thirty-nine out of fifty-six (69%) curriculum students responded to the survey. Of respondents, 84% felt the curriculum was a valuable learning experience, and for 76% the curriculum increased their desire to work with underserved patient populations. Responses indicated desire for increased HHIE and OVP collaboration, and more time with physician mentors.

### **Lessons learned:**

Based on student interest, continued integration of OVP and HHIE is warranted. This partnership also yielded collaborative advocacy work for individuals affected by the Long Island Bridge closure.

### **Future directions**

The curriculum will continue with ongoing student leader assessment and organization, and physician mentor guidance. Creation of a holistic homeless health track will be explored for future years. Funding is provided by the Office of Enrichment.

### **Reference:**

1. Jain, S., & Buchanan, D. (2003). A curriculum in homeless health care was effective in increasing students' knowledge. *Medical Education*, 37(11), 1032–1033.  
<http://doi.org/10.1046/j.1365-2923.2003.01657.x>

## THE SNAP CHALLENGE: EDUCATING THROUGH EXPERIENCE

Iris Trutzer, Jacquelyn Piraquive, MS, Joshua Mervis, Joseph Chung, David Hui, Kathy Ireland, MS, RD, LDN, Aaron Manders, RD, LDN

### **Problem:**

Over the last 3 years, SNAAC has conducted the SNAP challenge where BUSM medical students and faculty to live on a SNAP budget for 7 days. The goal is for students to gain a better understanding of food insecurity, more empathy for their patients, and more comfort speaking to patients about food insecurity. While anecdotally a worthwhile experience, SNAAC has never completed a formal evaluation to determine if the SNAP challenge should be added to the BUSM curriculum.

### **Objectives:**

To evaluate the effectiveness of the SNAP challenge as a tool to educate students and faculty on food insecurity, and to assess whether the SNAP Challenge would be appropriate to implement as part of the curriculum at BUSM

### **Methods:**

Participants lived off the average federal SNAP benefit of \$33/week for all food items. Participants were asked to complete a post-challenge survey to assess adherence to challenge guidelines, individual experiences over the course of the week, and opinions on the SNAP challenge as an educational tool

### **Results:**

12 students participated in the SNAP challenge. 50% reported successfully completing the challenge. All students reported that they attained a better understanding of the meaning of food insecurity and agreed that participating in the challenge was a worthwhile experience. 50% felt more comfortable talking to their patients about food insecurity.

### **Discussion:**

The SNAP challenge was a worthwhile and educational experience for participants indicating that more students may benefit from participating in the challenge. Incorporating the challenge into the medical curriculum would help cultivate understanding and empathy for patients' food-related needs. More education for students to help them complete the challenge and feel more comfortable talking to patients about food insecurity may need to be incorporated with the challenge.

Support from NFL grants (New Balance and Allen Foundation)

## **INVESTIGATING THE NEURAL CORRELATES OF SUCCESSFUL LEARNING IN A CLASSROOM ENVIRONMENT: THE ASSOCIATION BETWEEN COURSE PERFORMANCE AND ELECTROPHYSIOLOGICAL DATA**

Wang, E., Tat, T., Nagle, C., Frustace, B., Deason, R., El-Shaar, A., Iyer, A., Gherbmichael, A., Flannery, S., Farrar, D., Zumwalt, A., Budson, A.  
Center for Translational Cognitive Neurosciences, VA Boston Healthcare Center

### **INTRODUCTION:**

Despite the vast amount of research that have examined the relationship between human memory and learning, few have examined this relationship in environments simulating real life settings. This study examines learning in a classroom environment, specifically with students enrolled in a medical anatomy course, by using electroencephalography (EEG) to measure their electrophysiological responses. We aim to find a correlation between memory and learning by using course grade as a measure of memory retention.

### **OBJECTIVES:**

- 1) To find an association between the electrophysiological correlates of memory and course grade
- 2) To determine the possibility of an electrophysiological indication of successful learning.

### **METHODS:**

37 students who were taking the BU Medical Gross Anatomy course were recruited to participate in this study. They were presented with 176 anatomical terms (132 terms learned in the course & 44 outdated terms) and then given 3 response choices: whether they “Can Define”, are “Familiar” with, or “Don’t Know” the term. EEG was used to record their neural activity in response to these anatomical terms, which were then averaged based on the response type in order to analyze the difference in amplitude for neural components thought to be associated with learning and memory. Both Pearson correlation and multiple linear regression analyses were then run to investigate if any significant relationship between neural amplitude and grades existed, and if so, the degree to which electrical activity can predict the course grades received.

### **RESULTS:**

Results showed a higher amplitude in frontally based signals for “Can Define” responses for the early frontal effect, which is associated with memorial familiarity. A larger electrical amplitude was detected for “Familiar” responses for a late occurring signals thought to be associated with the effortful retrieval of memories. Final results, derived from statistical analyses, found that the early frontal effect for the Can Define responses over the Right Posterior Superior scalp region is the best predictor variable for student performance in the medical anatomy course.

### **CONCLUSION:**

For our study, we tested for difference in neural amplitudes following stimulus using terms the participants learned in class. The electrical activity among responses was mostly consistent with previous studies, except for the late parietal effect which was not seen. We also found a potential predictor of successful learning in a classroom environment. This finding has the potential to determine whether information learned in a classroom setting has in fact been incorporated into long-term or even semantic memory.

## MCME PROJECT: DELIVERING CONTINUING MEDICAL EDUCATION FOR COMMUNITY HEALTH WORKERS VIA SMS TEXTS

Yeshitla M<sup>1</sup>, Kleber K, Bird L, Xu H, Belkin D, Abou-Arraj N, Gill CJ.

### Purpose

Community health workers (CHWs) provide essential primary health services, often as the only source of these services, in rural parts of many low and middle income countries around the globe. They are often trained in a short period of time with a lot of material covered and limited resources, including updated medical information, to support their services in the field. For this reason it is important to re-train them regularly and keep them updated to maintain their competence and to ensure effective and quality service provision. When available and affordable, refresher trainings are provided in the form of workshops and seminars that are held in a central location, often requiring the removal of CHWs from their work sites for a few days. This can result in negative health outcomes for the communities they serve as they are left without essential service during that time. While it is customary in many developed nations to use internet-based modules and assessments to provide continuing medical education (CME) to clinicians, it is not a feasible method in resource limited settings. However, cell phones are increasingly available and utilized in these areas. The mCME project aims to test the effectiveness of SMS-based CME to community-based physician assistants (CBPAs), who provide a range of primary health care services in rural parts of Vietnam. This novel approach aims to improve their medical knowledge and job satisfaction through necessary training without removing CBPAs from their work sites.

### Background

CBPAs in Vietnam operate in rural settings, often with limited access to updated medical information and treatment support. The MOH of Vietnam recently mandated the provision of CME to CBPAs with limited planning in terms of budget, mechanism of delivery and mechanism to track completion of CME. This project aims to design an innovative CME delivery mechanism which can improve medical knowledge among CBPAs and have the potential to significantly improve their job satisfaction. One technology universally available to these workers is mobile phones. Our study aims to provide CME via SMS text messages to CBPAs and test the effectiveness and cost-effectiveness of this method. This study is a three arm randomized control trial involving two intervention groups and a control. We hypothesize that CME provided via SMS will improve the knowledge and job satisfaction of CBPAs. Further, we hypothesize that CBPAs receiving CME in an interactive model (daily SMS messages containing a medically relevant multiple choice question) will learn the material better than those receiving CME in a passive model (daily SMS messages containing thematically identical medical fact as a bullet point). The primary measurement tools are two 100 item multiple choice exams that are administered at baseline and end line. Our primary outcome measure is the mean scores of CBPAs on these exams.

### Research Questions

Primary Question

- Can CME provided over cell phones (SMS) lead to better medical knowledge among CBPAs?

Secondary Questions

- Can this also improve job satisfaction and self-efficacy?
- Is this approach cost effective?
- How do CBPAs react to this intervention?

### Methodology

This is a three arm randomized control trial involving 660 CBPAs from Hanoi, Vietnam

The study participants are divided into three groups.

- Group-1: Controls, receive non-medical texts weekly to keep them engaged in the study
- Group-2: Intervention 1, daily SMS messages containing medical facts as a bullet point
- Group-3: Intervention 2, daily SMS messages containing the same theme of medical fact in the form of a multiple choice answers

All study participants will take a 100 item multiple choice exam at baseline and end line, which will serve as the primary measurement tool for this study

The exams will cover identical thematic areas with different questions, in different orders (multiple versions of each exam)

The secondary outcome measurement tool is a qualitative piece of the study involving FGDs and 5- level likert scale assessment at baseline and end line

The intervention will begin on May 2015 and end on November 2015

### Conclusion

This study is in its research and content development completion stage at this time. The intervention is planned to begin in May 2015 for duration of six months. Depending on the results, similar interventions could be designed and tested for a variety of topics, such as HIV/AIDS, common cancers, etc. It would be particularly useful to hear from the CBPAs themselves regarding which topics they would like covered. Another possibility for future research would be testing this intervention with primary care providers in other areas with limited resources; countries like Bhutan, for example, which has a fairly robust health care system facing the challenge of caring for a very dispersed population, could benefit from an intervention such as ours if it proves useful.

## **PREPARING FUTURE PHYSICIAN EDUCATORS: LEARNING HOW TO ASSESS FIRST YEAR MEDICAL STUDENT CLINICAL INTERVIEWING SKILLS AND TO TEACH CLINICAL REASONING**

Young, ME, Department of Medicine, BUSM Section of Geriatrics and Office of Medical Education  
Nanette Harvey, MD Department of Family Medicine, BUSM and Office of Medical Education

### **BACKGROUND:**

4<sup>th</sup> year medical students are immediately thrown into the role as teachers when they become interns and residents yet many of them have no formal training in education. They are instantly asked to provide feedback, assess and teach clinical reasoning and often facilitate small group or on-the-fly teaching sessions with different levels of learners. Our goal is to create an elective for 4<sup>th</sup> year medical students that aims to teach 4<sup>th</sup> year students how to

- 1) evaluate the clinical interviewing skills of medical students in earlier years of school,
- 2) provide the students with meaningful feedback and
- 3) evaluate the student's clinical reasoning and facilitate a small group teaching session.

It will also benefit 1<sup>st</sup> year medical students by giving them a standardized patient interview experience, feedback on that experience and an opportunity to use and develop clinical reasoning skills about the case presented by the 4<sup>th</sup> year student.

### **METHODS:**

In academic year 2014-2015 four 4<sup>th</sup> year medical students and Twenty-seven 1<sup>st</sup> year medical students participated in the elective. The goals of the elective for the 4<sup>th</sup> year medical students were 1) to play the role of a standardized patient and evaluate the clinical interviewing 2) provide the 1<sup>st</sup> first year student with feedback on those interviewing skills and 3) teach the fundamental process of clinical reasoning based on the history obtained in the interaction in a problem based learning (PBL) setting. Descriptive statistics were calculated and free-text responses were analyzed for common themes.

### **RESULTS:**

All 4<sup>th</sup> year students who participated in the elective rated the overall quality of the elective as excellent. On a 5-point scale with strongly agree as the highest mark all students answered strongly agree that the elective was organized in a way that facilitated learning, that the goals and objectives were clear, that the evaluation criteria was clear and fair, that the elective met their educational goals and that they would recommend the elective to other students. Qualitative themes emanating from the open-ended comments included: unique opportunity for one-on-one feedback from faculty, mutual benefit of both 1<sup>st</sup> and 4<sup>th</sup> year students and opportunity to get feedback on feedback giving skills.

74% of the first year students evaluated their experience using a 5-point Likert scale. 100% of students answered agree or strongly agree that the session with the standardized patient provided an effective opportunity to further develop their communication and interviewing skills and that the feedback they received from the standardized patient is something they will use going forward and was specific to their learning needs. 80% of the students agreed or strongly agreed that the larger group PBL session helped demonstrate the process of clinical reasoning in developing a differential diagnosis. 95% of students recommended that this experience be required or all first year students. Qualitative themes emanating from the open-ended comments included: enhancement of both the current Introductory to Clinical Medicine (ICM) and Integrated Problems (IP) course by combing the two entities, mutual benefit of both 1<sup>st</sup> and 4<sup>th</sup> year students and personalized feedback and learning from peers.

### **CONCLUSION:**

Student feedback demonstrated that a teaching elective in the 4<sup>th</sup> year successfully met the learning objective. Furthermore 1<sup>st</sup> year students benefited from the experience and request this be expanded to the full class as a valuable exercise.

## COMPREHENSIVE OPPORTUNITIES FOR RESEARCH AND TEACHING EXPERIENCE (CORTEX): A MENTORSHIP PROGRAM

Rafael Zuzuarregui, MD, BUSM Neurology

### **A Mentorship Program**

**Objective:** We developed a program to promote medical student interest in pursuing a career in Neurology. This program focuses on medical student mentorship. It also provides opportunities in teaching and clinical research in order to provide students with marketable skills for an academic career in Neurology.

### **Methods:**

Through this program, students are provided with guidance in developing a fourth year clerkship schedule and an application package for residency programs. Students are involved and mentored in clinical research. Opportunities are also provided for students to teach their peers, with sessions focusing on examination preparation.

### **Results:**

Since the implementation of this program in 2010, the number of students entering into the field of Neurology from our institution significantly increased from fourteen students between 2006 and 2010, to thirty students between 2011 and 2014 ( $p < 0.05$ ). Medical student research productivity increased from seven publications during 2006 to 2010, to twenty-two publications, fourteen poster presentations and a book chapter after implementation of this program in 2010 ( $p < 0.05$ ).

### **Conclusions:**

In this mentoring program, students are prepared for residency application and provided with research and teaching opportunities. Students develop a highly desirable academic skill set for residency and have matched at top ranked institutions. This program has been successful in improving student productivity in clinical research and garnering student interest in Neurology.