The National Board of Medical Examiners® (NBME) is an independent, not-for-profit organization that provides high-quality examinations for the health professions. Protection of the health of the public through state-of-the-art assessment of health professionals is the mission of the NBME, along with a major commitment to research and development in evaluation and measurement. The NBME was founded in 1915 because of the need for a voluntary, nationwide examination that medical licensing authorities could accept as the standard by which to judge candidates for medical licensure. Since that time, it has continued without interruption to provide high-quality examinations for this purpose and has become a model and a resource of international stature in testing methodologies and evaluation in medicine.

**OUR MISSION**

To protect the health of the public through state-of-the art assessment of health professionals. While centered on assessment of physicians, this mission encompasses the spectrum of health professionals along the continuum of education, training and practice and includes research in evaluation as well as development of assessment instruments.
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THE NBME ORGANIZATION
MESSAGE FROM THE PRESIDENT

NBME is striding forward, fueled by learning, innovation, and insight, and focused on targeted strategic growth.

As I sat reflecting on NBME’s activities in 2017, an unexpected metaphor came to me — the concept of synaptic pruning. Synaptic pruning is related to learning, and is the process by which humans and other mammals discard the abundance of neurons and wide-ranging synaptic connections that exist at birth, and hone those connections that are most appropriate and useful, making room for more efficient and complex thought processes.

In many ways, that is what the staff at NBME has done in the past year, as we shifted from trying to chart virtually unlimited potential in many directions, to defining the specific paths we want to take in order to diversify, improve, and grow.

We began this process by using facts and forecasting to imagine what a successful NBME might look like in 2030, and then focused on prioritizing projects that will move us toward that goal. We put fresh emphasis on having concrete, objective measures of success attached to our evolving ventures, and took a hard look at some of our existing initiatives, making data- and experience-driven decisions to stop or furlough projects that were not meeting objectives. We revamped some of our systems as well — putting our customers first with a new customer relationship management system, installing a new content-creation and -management system to benefit our volunteers, and shifting our annual planning/budgeting process to a rolling three-year look ahead, beginning in 2018. While these initiatives are not complete, they help us begin to achieve the future we envision.

We also turned our attention inward, to do some serious work defining the culture we would like to see thriving at NBME. We codified those ideas in ten bold statements (see page 11), and started putting them into action with a wide variety of staff-driven “social prototypes.” Alongside our effort on culture, we solidified our ideas about how we want to go about our work — with an emphasis on continuous improvement and mutual respect — by further developing the concept of the NBME Way. We made other advances as well, from new staff, to new programs, to new ways to communicate, which you will learn more about in the pages that follow.

At last year’s annual meeting, in my first address to our membership as president, I shared a vision of an NBME that would be innovative, connected and better known, collaborative, adaptable, meaningful, and secure. The progress and accomplishments of the past year have made me optimistic that we are well on our way to achieving this vision, working shoulder to shoulder to benefit patients around the world.

Peter J. Katsurakis, MD, MBA
President
MESSAGE FROM THE CHAIR

When I think about the NBME’s strengths as an organization, there is one characteristic that is particularly relevant now — NBME’s exceptional capacity to embrace change. At last year’s annual meeting, I referenced the words of Robert Kennedy from 1966: “There is a Chinese curse which says ‘May he live in interesting times.’ Like it or not, we live in interesting times. They are times of danger and uncertainty, but they are also more open to the creative energy of men than at any other time in history.” The past year at NBME has borne out this statement — in a year of great transition, and within a healthcare environment in a state of dramatic flux, the NBME has also embraced new priorities and fresh ideas with enthusiasm.

Guiding this innovation has been NBME’s most visible example of change: our new president, Dr. Peter Katsufrakis, comfortably taking the reins from his long-tenured predecessor, Dr. Donald Melnick. With the full support of our board, Peter has encouraged NBME to look outward — for data, for inspiration, for new business models, and for fresh ways to apply our organization’s singular expertise to help address today’s health education and healthcare challenges.

There are many new elements in the contemporary practice of medicine — healthcare delivery in multi-function teams, the inclusion of other health professionals in front-line care, and the increasing and important role of the patient voice in healthcare decision-making, among others. NBME is well positioned to support these new elements with initiatives ranging from changes in test content and opportunities for new professional certifications, to learning from the guidance of our Public Stakeholders Committee. More than ever, healthcare is also global in its outlook, and NBME is poised to build and expand on its international experience as well, whether working with individual medical schools abroad or working with government entities to create a culture of assessment in other nations.

However, these are only the changes that we see before us. We know that medicine is in a transformative era, and while it will serve us well to become more targeted in our goals for growth, we also know that we must constantly seek out the new perspectives, technologies, and opportunities that will keep NBME nimble and adaptable in a shifting sector. Our extraordinary corps of volunteers plays a key role in keeping NBME agile in this way, by providing not only their dedicated service, but also critical insights from their vantage points in medical education, public policy, research, and industry. The importance of our volunteers cannot be overstated — thank you!

As you will read in this annual report, NBME is harnessing its creative energies to move forward in many directions, choosing paths that are innovative, collaborative, and, we hope, productive roads to future success.

Suzanne T. Anderson
Chair
New Leaders at NBME

NBME was delighted to add several new senior staff members to its team this year.

MICHAEL BARONE, MD, MPH
A familiar face at NBME thanks to more than a decade of service as a volunteer, Dr. Barone joined NBME this year as vice president of licensure programs. Among his many roles at NBME, he has served on the Step 2 Clinical Skills Standard Setting Panel; the Step 1 Interdisciplinary Review Committee; Forms Review Committees for Steps 1, 2, and 3; the USMLE Communications Task Force; the USMLE Management Task Force; and as vice chair of the USMLE Management Committee. A pediatrician, Dr. Barone comes to NBME from a long career at the Johns Hopkins University School of Medicine, where he was deeply engaged in medical education. He managed many aspects of clinical education at Hopkins, including roles as pediatric clerkship director, and director of the inpatient pediatric subinternship. He served as assistant dean of student affairs from 2004 to 2014, and director of the PRECEDE pre-clerkship curriculum, as well as associate dean for faculty educational development. He maintains a faculty affiliation at Johns Hopkins as associate professor of pediatrics. Dr. Barone is also a past president of the Council on Medical Student Education in Pediatrics (COMSEP) and has interests in competency assessment, clinical reasoning, and humanism in medicine. Dr. Barone received his medical degree from Northwestern University and his Master of Public Health from Johns Hopkins.

LISA RAWDING, MBA
Ms. Rawding is NBME’s new senior vice president for Assessment Programs. Prior to joining NBME, she spent thirteen years with the NEJM Group, a division of the Massachusetts Medical Society and publisher of the New England Journal of Medicine, where she served as executive director of customer insights, strategy, and corporate marketing. Her responsibilities included facilitation of NEJM Group-level strategy, planning, and corporate marketing. In addition, Ms. Rawding led the NEJM Group education teams in defining an expanded education strategy and in developing business plans to ensure the continued growth and performance of the NEJM Knowledge+ and Continuing Education and Certification programs. Before her shift to healthcare, Ms. Rawding’s career began with more than a decade at IBM, and then moved into marketing and consulting roles for the legal services and media sectors. Ms. Rawding received her MBA from New York University’s Stern School of Business.
LARRY SOLOW, MA
An expert in change management and process improvement, Mr. Solow joined NBME as the director of enterprise transformation in March 2017. As an internal change agent, he served as director of continuous improvement at Harley-Davidson, manager of total quality for AlliedSignal Aerospace, leader of lean change management for Orbital ATK, and manager of change and business transformation for DLL Financial Services. His external consulting experience includes projects for businesses ranging from Mattel and Alcan Packaging to Federal Express, AtlantiCare, and Inspira Health Network. He also has consulted with not-for-profit institutions including UNICEF, the American Red Cross, and Rotary International. Mr. Solow is the co-author of two books, *Complexity Works! Influencing Pattern-Based Change in Teams and Organizations, and What Works for GE May Not Work for You: Using Human Systems Dynamics to Build a Culture of Process Improvement*. Mr. Solow is a Six Sigma Black Belt and received his MA in Organizational Communications from Temple University.

PAMELA TREVES, MBA
Ms. Treves, vice president of marketing and communications, joins NBME from ETS® (Educational Testing Service). She began her career at ETS as director of strategic marketing for the TOEFL® brand, before moving to executive director of ETS Brands, leading strategic marketing across all of ETS’s brands including TOEIC®, TOEFL, Praxis®, and GRE®. Prior to ETS, Ms. Treves worked in brand management for Johnson & Johnson, Wyeth Consumer Healthcare (now Pfizer), and Playtex Products where her experience included innovation and new product development, prescription to over-the-counter switch, and management of brands such as Advil®, Preparation H®, and Imodium®. Before working in marketing and brand management she held positions in the cultural sector at institutions including the Smithsonian Institution’s Freer & Sackler Galleries of Art and the Mark Twain House. Ms. Treves received her MBA from Columbia University.
A New Opportunity

The NBME Executive Board approved the creation of the Strategic Educators Enhancement Fund in 2017. The fund is designed to provide opportunities of value to the medical education community, among others, from which our volunteer force derives. Starting this year, the fund will sustain annual conferences and other activities to help NBME engage with and support the medical education community. The inaugural NBME Invitational Conference for Educators will be held May 7–8, 2018, in Philadelphia, and NBME will cover all attendees’ conference expenses. NBME hopes this opportunity for our nation’s medical schools will support professional growth and, over time, create a core of educators who will have specialized training in assessment and who can be resources for their peers.

It’s About TIME

In October 2017, NBME hosted TIME: the Timing Impact on Measurement in Education conference, a two-day meeting that provided a forum for scholars in psychometrics, cognitive science, and education to share research and perspectives on timing and pacing for high-stakes tests, and to discuss the implications of timing considerations for policy and practice. The free conference aimed to address a wide range of topics related to examination timing, including policy considerations, empirical research on time limits, modeling response time, collateral uses of response time (e.g., examinee engagement), and the extent to which speed of processing should be part of the construct for high-stakes tests. The event was a resounding success, and most of the conference material presented will soon be available in a book, edited by Melissa Margolis and Rich Feinberg and tentatively scheduled for publication in late 2018. For more on the TIME conference, turn to page 63.

A New Certification for a Thriving Field

More than 1,200 examinees sat for the pilot administration of the Health & Wellness Coach Certifying Examination (HWCCE) in September 2017. For the past several years, NBME has collaborated with the International Consortium for Health & Wellness Coaching (ICHWC) to develop the new certification exam, designed to set minimum standards for competence in areas such as the coaching relationship, communication techniques, processes for behavior change, ethics, professionalism, and more. Participants who pass the exam will be designated National Board Certified Health & Wellness Coaches (NBC-HWC). The next test administration will take place nationwide in June 2018, and by the end of the year, we hope to see more than 2,000 NBC-HWCs listed in a new public directory on the ICHWC website. For more information, please visit www.nbme.org/hwc.

USMLE Reaches Out

One of NBME’s overarching goals is to become a more accessible and transparent organization by strengthening communication with all of our audiences. We have begun to work toward that goal through several new initiatives aimed at building stronger relationships with medical students. In collaboration with colleagues at the Federation of State Medical Boards (FSMB) and the Educational Commission for Foreign Medical Graduates (ECFMG), we began by creating communication touchpoints along a student’s journey to becoming a doctor. The first new touchpoint was a letter from Presidents Peter Katsufrakis and Humayun Chaudhry (FSMB) that was distributed by US and Canadian medical schools to incoming medical students. Our outreach efforts also include the creation of a new Student and Resident Advisory Panel, made up of 13 members, who will be domestic MD and DO students and residents, as well as US citizen international students. The panel will assist USMLE staff in working through operational issues directly impacting the examinee experience, and serve as a voice and resource to inform substantive policy questions for official USMLE committees. The inaugural meeting is expected to be held in the spring.

The third facet of our outreach effort involves social media — the development of new content for NBME and USMLE’s student-focused social media channels.
Internal Initiatives

**NBME 2030**

NBME 2030 expresses the strategic principles for the NBME's future through five pathways: maintaining and growing our current business, diversifying our products and services, improving our productivity, innovating, and expanding internationally. The roadmaps created through the NBME 2030 process will provide concrete targets to guide activities for the coming decade, ensuring that the NBME maintains its mission of protecting the health of the public through state-of-the-art assessment of healthcare professionals. In 2017, five planning teams produced a report that included their recommendations for actions the organization could take to realize the vision of 2030. This work helped to inform the creation of organizational objectives that were developed at the end of the year: Grow, Improve, Diversify, and Culture. The objectives are steps along the journey toward making NBME 2030 a reality. To ensure that we stay on course, the organization will embark upon multi-year planning. The multi-year perspective will help us course-correct as we move forward. Our 2030 vision is continually evolving, its goals supported by NBME's commitment to the long-term culture shift described below, as well as by the pillars of NBME Way.

**NBME Way**

NBME Way is how NBME approaches its work in order to achieve yearly objectives and longer-term strategic goals, with two principal pillars — continuous improvement and respect for people — forming its foundation. NBME Way is designed to build upon what our organization learned in its early continuous improvement work and to become integrally linked with our evolving culture.

In 2017, the project team updated the roadmap for NBME Way and planned a full rollout to staff. Next steps involve communication, curriculum development, and training, which will be developed and led by the Enterprise Transformation unit, with partners across all divisions. Project leaders are currently developing a curriculum and training program to include three levels of technical training, a leadership development course, new hire awareness training, and other offerings.

To provide inspiration for this work, a cross-section of the Extended Leadership Team as well as NBME Way project leads visited Virginia Mason Health System to gain insight into how a mature continuous improvement organization functions. The team came back with a fresh vision of what is possible; a clear understanding of the dedication, commitment, and mindset changes needed to be successful; and the enthusiasm to implement NBME Way more fully in the months ahead.
Culture Co-Creation

The Culture Co-creation Design project focuses on improving the culture and strengthening the community of the NBME so that any strategic initiative the organization undertakes meets greater success. Through workshops, information sessions, and other creative brainstorming endeavors, staff members across the NBME are collaborating, enacting social experiments, deepening their listening skills, and embracing positive change to ensure the NBME’s vibrant future. Milestones in the long-term process of cultural change included the development of NBME’s ten “Bold Statements” (listed below), reflecting qualities and values the entire staff would like to see embraced at all levels of the organization. To help bring these statements to life, a diverse series of staff-led “social prototypes,” has been developed. They range from mentoring and volunteer activities to prototypes that support work-life balance. The work on improving our culture continues to be a priority, and stands as one of the institutional objectives for 2018.

NBME Bold Statements

It begins with leadership.

As an organizational leader:

• I set clear priorities and resource them.
• I delegate and empower.

Then it takes all of us.

• I communicate directly, simply, and with empathy.
• I actively seek collaboration.
• I contribute to our caring and diverse community.
• I respectfully hold myself and my colleagues accountable for results.
• I make time for work-life balance, reflection, planning, and relationships.
• I take courageous action, wonder with colleagues, innovate, and continuously improve.
• I lean in to conflict as a source of creativity.
• I look outward to learn — outside my department and beyond our walls.
Investing in Infrastructure

NBME made some significant upgrades to infrastructure in 2017, with several initiatives promising to improve efficiency and productivity across the Board's activities. Each of the projects described below are the result of many months of research, planning, implementation, and training across the organization, and we salute our colleagues for their successful efforts effecting positive change.

CUSTOMER FIRST

The objective for the Customer First program is to transform the customer experience by replacing more than 25 aging software applications with the best-in-class tool, Salesforce, as well as improving our business processes. For example, instead of recording all incoming customer support phone calls and emails in a variety of disparate systems, internal staff are now using Customer First Salesforce software to record all interactions. Using one system provides a 360° view of a customer's interaction with NBME, benefiting both the organization and the customer by:

- Making data analysis easier and more streamlined.
- Allowing NBME to take a step toward one-call resolution by having more customer interaction data available within one system.
- Having a single point of entry, and thus a better experience, for our customers.

The first two iterations of Customer First were implemented in 2017, with 100 percent of our Customer Operations Management staff now using the new tool and processes. In 2018, we will extend Customer First to the first sets of external customers. Eventually, it will become the one system that any external customer will use to transact business with NBME — covering everyone from students, residents, and medical schools, to practitioners, collaborators, and international organizations.

LION’S GATE

Lion’s Gate is a multi-year initiative to replace NBME’s aging legacy systems for three processes that are the foundation of our business: (1) item development and banking, (2) test construction and delivery, and (3) scoring and delivery. The first phase, item banking and authoring, had its initial launch in the fall of 2017.

The benefits of this project include:

- Item author volunteers will access a single-sign-on, web-based system to submit their items.
- Item author volunteers and NBME staff editors will be able to collaborate on items in the same web-based system.
- There are quality and efficiency benefits through increased automation and retirement of multiple outdated technology solutions.

Our transition from legacy systems to the new, modernized authoring and banking system will continue through 2018 and beyond.

NUXEO

The Nuxeo Digital Asset Management (DAM) system was developed as the replacement for the now-retired Artesia DAM. This system allows NBME staff, committee members, and customers to effectively produce, manage, retrieve, present, and archive hundreds of thousands of media files and their associated metadata. Nuxeo went live in September 2017, and all exam programs are migrated and using the system for media management and access. The many benefits of the Nuxeo system include the following:

- Many tasks are now automated, including creation of exam delivery-specific media formats and watermarks for USMLE images.
- There is increased reliability, upgradability, and scalability.
- The new system eliminates manual handoffs and external tools to handle the import of media, so committee members can now import directly into the tool.
- Presentation of media for committee meetings is greatly enhanced.
- The new system eliminates tedious spreadsheet management for bulk system imports, metadata entering, and management of submitted media.
- Easy project creation and management no longer requires IT assistance.
- Nuxeo is open source, with highly visible online application documentation and a robust user community.
- Videos no longer need to be manually converted for web display. HTML5 video conversions happen seamlessly, and there is a full-screen playback option.
- There is no restriction on size of media uploads.
- We now have guaranteed uptime and external Amazon Web Service Cloud support.
- Search is greatly enhanced, with instant results, facets, and filtering of any metadata on the fly.
Office of Public Engagement

In 2017, NBME’s Office of Public Engagement worked with the Public Stakeholders Committee as it turned its focus toward new ways to bring patients’ voices into the work of the NBME. The committee welcomed perspectives from advocates who focus on the use of technology to keep patients informed, as well as those who foster partnerships between medicine and law.

The Public Stakeholders Committee also furthered its exploration of the patient experience by collaborating with the Strategic Futures Committee, which conducts a rigorous process of environmental scanning and prioritization across multiple domains to identify trends and drivers important to the NBME. The group generated a list of top patient concerns, ranking them by what they believe to be of most importance to the general public. The results were then compared to the Public Stakeholders Committee’s Top Patient Issues List, revealing common themes of communication skills, safety and quality of care, and cost/price transparency.

To close the year, the Office of Public Engagement supported the Public Stakeholders Committee board liaison, Pat Mastors, at the 2017 Leapfrog Awards by attending and co-presenting the 2017 Patients’ View Impact Awards. This is the second year NBME has supported awards in four categories: Hope, Impact, Partners in Healing, and Lifetime Achievement.

PUBLIC STAKEHOLDERS COMMITTEE

Chair
DEBORAH BRICELAND-BETTS, JD
Silver Spring, Maryland

SUZANNE T. ANDERSON
Virginia Mason Medical Center
Seattle, Washington

KAREN W. FEINSTEIN, PHD
Jewish Healthcare Foundation
Pittsburgh, Pennsylvania

KATE FICK
Boise, Idaho

VICKI W. GIRARD, JD
Georgetown University Law Center

RUTH HOROWITZ, PHD
New York University School of Arts and Science

PETER J. KATSUFRAKIS, MD, MBA
National Board of Medical Examiners

PAT MASTORS
Patients’ View Institute
East Greenwich, Rhode Island

DANIEL W. MORRISSEY, OP, STLR, MA, MA
Columbia University College of Physicians and Surgeons

JEAN L. REXFORD
Connecticut Center for Patient Safety
Redding, Connecticut

ZACH WEISMANN
CancerQ
Dallas, Texas

KAMILI WILSON
AARP Foundation
Washington, DC

DAVID ZAHN
Signal Advertising
East Calais, Vermont
Community Engagement

PHILADELPHIA READS

Philadelphia Reads was formed in 1997 to enhance the literacy experiences of Philadelphia’s students in kindergarten through third grade, ensuring they will be able to read well and independently. Philadelphia Reads works with individuals, schools, community and faith-based organizations, and businesses to provide mentors, resources, and advocacy for in-school, after-school, and summer programs. Together these partners and Philadelphia Reads help to strengthen the literacy skills of the city’s youngest and neediest schoolchildren.

Since joining Philadelphia Reads Power Partners in October 2008, NBME has hosted first-, second-, and third-grade classes from Drew Elementary in University City and Penrose Elementary in Southwest Philadelphia. As literacy coaches (Power Believers), NBME staff from various departments volunteer during their lunch hour each Wednesday from October through June to read at NBME offices with students (Power Achievers). Each student is assigned to one coach or a pair of alternating coaches for the school year. For the final program session in June, NBME coaches visit the class at school.

Over 10 years as a Power Partner, 264 students, 151 NBME coaches, and 34 program support staff from NBME, Drew and Penrose, and Philadelphia Reads have participated. During the 2016–2017 school year, the program met for 21 reading sessions, and there are 28 sessions scheduled for the 2017–2018 school year. For more information, please visit www.philareads.org.
GIVING BACK
Several years ago, the NBME instituted a new benefit, allowing employees to use a certain number of work hours to engage in community service activities. In 2017, staff members volunteered their time for a total of 309 hours at 19 different area organizations. The following organizations hosted NBME volunteers in 2017:

• Animal Care & Control Team of Philadelphia (ACCT Philly)
• University City Hospitality Coalition
• Berachah Church
• Unite for HER
• St. Tikhon’s Summer Camp
• Avon Grove Community Theater
• For Pete’s Sake
• Calvary Chapel Puerto Rico
• New Britain Baptist Food Larder
• The Food Trust
• Holiday Hope
• New Covenant Ministries
• Great Wall Chinese School
• Atlantic County Library System
• MANNA
• Ukranian Educational and Cultural Center
• St. Cyprian Childcare Center
• Beth Am Israel
• Philadelphia Episcopal Cathedral

Academic Engagement
The NBME offers staff members a tuition reimbursement benefit to help them achieve their academic and professional goals. In 2017, 24 employees were supported by the NBME in their pursuit of further education, taking a total of 67 classes across a wide range of disciplines, and earning at least two master’s degrees.

NBME Staffing
The organization was happy to welcome 55 new staff members to the building in 2017, many of whom replaced longtime employees who took advantage of the initial phase of the early retirement program last year. NBME’s staff comprised 511 talented employees at the close of the year. NBME was also pleased to welcome 38 student interns (some of whom are pictured below) who joined NBME through the Drexel University co-op Program, an integral component of a student’s academic career that allows students to alternate classes with full-time employment through Drexel University-approved employers. Students are usually on co-op for a six-month period, alternating with six months of classroom study. Cooperative education at Drexel enables undergraduate students to balance classroom theory with practical, hands-on experience prior to graduation, and NBME is proud to partner with Drexel to provide this opportunity.
New Honorary Members

NBME’s 2017 Nominating Committee honored several individuals whose contributions to the NBME over many years are extraordinary. The bylaws allow the Nominating Committee to nominate individuals as honorary members for life, and this year the Committee found three deserving individuals.

LYNN CLEARY, MD

From her citation: “Lynn’s NBME volunteer service dates back to 1995. Among her many volunteer roles, she chaired the Step 2 Committee and the Step 2 Medicine Committee, served on the Hubbard Award Committee, Stemmler Award Committee, the Committee to Evaluate the USMLE Program, the Finance and Audit Committees, International Advisory Committee, and many, many others. Lynn has served in officer positions as treasurer and vice chair.”

KEN COTTON

From his citation: “Many of our friends on the NBME staff retired over the past year. While all will be missed, the Nominating Committee recognized one individual whose almost 38 years of service to the NBME have been extraordinarily valuable. Ken Cotton has held many roles at NBME. For the last 15 years, he served as secretary of the board and special assistant to the president. Ken is the quiet man behind the scenes who makes it all happen. He has been invaluable to the Executive Board, and his knowledge, commitment, and friendship are treasured.”

DON MELNICK, MD

From his citation: “Our immediate past president devoted well over 30 years of his professional life to the mission of the NBME, and we thank him deeply for his visionary leadership and look forward to continued work with him in new capacities.”
Distinguished Service Awards

The Edith J. Levit Distinguished Service Award was presented to five individuals who have devoted countless hours to the work and the vision of the NBME.

**CATHY CASEY, MD**
FROM HER CITATION:
“Dr. Cathy Casey has been volunteering for the NBME for at least 20 years. Her very long history of service includes, since 1997, at least 13 separate committees, task forces, or other activities, such as the USMLE Step 3 Test Material Development Committee for Family in Community, the Step 3 Committee, the Committee to Evaluate the USMLE Program, the always-popular USMLE Committee for Individualized Review (which she chaired from 2013–2015), the 2017 Nominating Committee, and many other efforts in support of the NBME mission.”

**JOE GRANDE, MD, PHD**
FROM HIS CITATION:
“Dr. Joe Grande began his volunteer service with NBME in 1995 as an item writer for the NBME pathology committee. He served on many USMLE test item development committees and interdisciplinary review committees, chaired the Step 1 Committee, served on the USMLE Composite Committee and the Hubbard Award Committee, and authored lessons for NBME U. Joe has served as an at-large member of the Executive Board since 2013 and concludes his service in this category of membership.”

**MONICA LYPSON, MD, MHPE**
FROM HER CITATION:
“Our records for Dr. Monica Lypson date back to 1996, when she was a student member of the Step 1 Committee. Since that time, Monica has served on at least 10 committees and task forces, including a Step 1 interdisciplinary review task force, the Audit Committee, Finance Committee, Communications Task Force, USMLE Budget Committee, and the Health & Wellness Coaches Governing Council. In addition, Monica has been an at-large member of the Executive Board since 2013 and is concluding her service to NBME in that capacity.”
LESLEY SOUTHGATE, DBE, DSC

FROM HER CITATION:
“Our records on Dame Lesley Southgate date back to 2008, when she was the recipient of the 2008 John P. Hubbard Award. She is also likely the only member of the NBME ever to be named Dame Commander of the Order of the British Empire. She has been an at-large member of the NBME since 2009, chaired the 2011–2012 Hubbard Award Committee, and served on the Nominating Committee, the Centennial Planning Committee, and the International Oversight Committee. In addition, she was a good sport and agreed to serve as a judge for our 2015 Centennial Prize Competition.”

ALISON WHELAN, MD

From her citation:
“Dr. Alison Whelan’s NBME service history dates back to 1997, when she served as a Step 2 Item Harvester. Since that time, she chaired the Step 2 Committee and served on the Step 2 Medicine Committee, was a member of the CRU Design Task Force, Center for Innovation Advisory Committee, USMLE Management Committee (which she chaired from 2014 to 2016), CSEC Operations Oversight Committee, and many others. Alison has been an at-large member of the Executive Board since 2015.”
2017 Hubbard Award

The NBME’s Hubbard Award honors excellence in the field of assessment as a tribute to the late John P. Hubbard, MD. Honoring Dr. Hubbard as a principal, guiding force of the NBME, this award acknowledges his creative and inspired leadership of the organization during his 25-year tenure as its chief executive.

THEODORUS JAN (OLLE) TEN CATE, PHD

FROM HIS CITATION:
“Dr. ten Cate’s significant, innovative, and sustained contributions to assessment in medical education have advanced the field for over 35 years. Among his many achievements, the Hubbard Award Committee members noted in particular his groundbreaking work in the conceptualization and design of entrustable professional activities (EPAs), as well as his work in competency assessment, multisource feedback, workplace-based assessment, publications and mentorship of doctoral students. Quoting his letter of nomination, Dr. ten Cate is ‘a pioneer who has advanced assessment in medical education.’”

For more information, please visit: www.nbme.org/about/hubbard/2017-hubbard.html.
Membership of the National Board of Medical Examiners and Members of Board Committees

Chair
SUZANNE T. ANDERSON
President of Virginia Mason Medical Center
Executive Vice President of the Virginia Mason Health System
Seattle, Washington
Member-at-Large
PETER B. ANGOOD, MD
President & Chief Executive Officer
American Association for Physician Leadership
Tampa, Florida
American Medical Association Representative
ALEJANDRO APARICIO, MD
Director, Medical Education Programs
American Medical Association
Chicago, Illinois
Member-at-Large
LEAH BINDER, MA, MGA
Chief Executive Officer, President & Director
The Leapfrog Group
Washington, DC
Honorary Member
L. THOMPSON BOWLES, MD, PhD
President Emeritus
National Board of Medical Examiners
Test Committee Representative
KAREN J. BRASEL, MD, MPH
General Surgery Program Director
Associate Dean, Graduate Medical Education
Oregon Health & Science University
School of Medicine
Federation of State Medical Boards
FREDA M. BUSH, MD
Senior Partner, East Lakeland OB-GYN Associates
Clinical Instructor, University of Mississippi School of Medicine
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The USMLE, cosponsored and co-owned by the NBME and the Federation of State Medical Boards, is the largest NBME examination program, accounting for more than 75 percent of the NBME's programmatic activity. The following summary includes highlights of significant activities in 2017 (additional information on research initiatives is provided on page 66–69).

**OUTREACH AND COMMUNICATIONS ACTIVITIES**

Additional content was added to our informational materials to better communicate expectations regarding the USMLE. Among these is a video explaining how to interpret a USMLE score report, and a list of common presenting signs and symptoms that examinees may expect to see in Step 2 Clinical Skills (CS). We have also increased our social media presence with informational updates, news, and reminders.

**NEW CONTENT DEVELOPMENT — EXPANDING ASSESSMENT OF NEW COMPETENCIES**

In 2017, efforts continued to expand the assessment of competencies beyond patient care and medical knowledge. Beginning in May 2017, some Step 2 CS examinees encountered a case in which the primary task was assisting the standardized patient with making decisions and/or with disease or problem management. All USMLE test material development committees (TMDCs) and task forces that write multiple-choice questions (MCQs) were asked to write questions assessing communication skills, legal/ethical skills and professionalism, or systems-based practice and patient safety. Examples of MCQs that examinees might encounter include knowing the most appropriate next step in infection control when caring for an immunocompromised patient in a busy community health center; safe inpatient care related to allergy and anaphylaxis awareness; helping parents make decisions about vaccine/immunization safety; and providing information about the risks and benefits of screening procedures.

**NEW ITEM FORMATS — PATIENT CHART ITEMS**

The Ambulatory Care and Acute Care TMDCs wrote items that present information in the form of an electronic health record (EHR)-style patient chart rather than a narrative vignette. The goal of this format is to present patient information in a more realistic way, while reducing the overall reading load of test questions. Examinees may begin seeing these types of questions as soon as mid-2018.

**USMLE PERFORMANCE AND STANDARD-SETTING ACTIVITIES**

For each Step examination, a pass or fail result is provided, as a USMLE recommendation, for each examinee. Passing results are based on achievement of specified levels of proficiency established prior to the administration of examinations. Statistical procedures are employed to ensure that for each Step, the level of proficiency required to pass remains uniform across all forms of the examination.

Every three to four years, the USMLE Management Committee is asked to complete an in-depth review of standards. The Management Committee conducted two such reviews in 2017 — for Step 2 CS in July, and for Step 1 in late November 2017. The Management Committee decided to increase the required minimum passing level for all three Step 2 CS subcomponents: Communication and Interpersonal Skills (CIS), Spoken English Proficiency (SEP), and Integrated Clinical Encounter (ICE). They also voted to raise the three-digit score recommended to pass Step 1 from 192 to 194.

The new minimum passing scores were applied to Step 2 CS examinations as of the September 10, 2017 administration, and for Step 1 administrations beginning January 1, 2018.

Details on the performance of examinees taking USMLE in the past two years are provided in the tables on the next page.
## TABLE 1 — 2016–2017 STEP 1 ADMINISTRATIONS
### NUMBER TESTED AND PERCENT PASSING

<table>
<thead>
<tr>
<th></th>
<th>2016 # TESTED</th>
<th>2016 % PASSING</th>
<th>2017 # TESTED</th>
<th>2017 % PASSING</th>
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</thead>
<tbody>
<tr>
<td><strong>EXAMINEES FROM US/CANADIAN SCHOOLS THAT GRANT:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MD DEGREE 1ST TAKERS</td>
<td>21122</td>
<td>94</td>
<td>21382</td>
<td>94</td>
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<tr>
<td>1ST TAKERS</td>
<td>20122</td>
<td>96</td>
<td>20353</td>
<td>96</td>
</tr>
<tr>
<td>REPEATERS**</td>
<td>1000</td>
<td>64</td>
<td>1029</td>
<td>67</td>
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<tr>
<td>DO DEGREE 1ST TAKERS</td>
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<td>93</td>
<td>3835</td>
<td>95</td>
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<tr>
<td>1ST TAKERS</td>
<td>3398</td>
<td>94</td>
<td>3786</td>
<td>95</td>
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<tr>
<td>REPEATERS**</td>
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<td>75</td>
<td>49</td>
<td>76</td>
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<tr>
<td><strong>TOTAL US/CANADIAN</strong></td>
<td>24576</td>
<td>94</td>
<td>25217</td>
<td>94</td>
</tr>
<tr>
<td><strong>EXAMINEES FROM NON-US/CANADIAN SCHOOLS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1ST TAKERS</td>
<td>15031</td>
<td>78</td>
<td>14900</td>
<td>78</td>
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<tr>
<td>REPEATERS**</td>
<td>2575</td>
<td>39</td>
<td>2303</td>
<td>41</td>
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<tr>
<td><strong>TOTAL NON-US/CANADIAN</strong></td>
<td>17606</td>
<td>72</td>
<td>17203</td>
<td>73</td>
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</table>

*Represents data for examinees tested in 2017 and reported through January 31, 2018.
**Repeaters represents examinations given, not number of examinees.

## TABLE 2 — 2015–2017* STEP 2 CLINICAL KNOWLEDGE ADMINISTRATIONS
### NUMBER TESTED AND PERCENT PASSING

<table>
<thead>
<tr>
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</thead>
<tbody>
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<td><strong>EXAMINEES FROM US/CANADIAN SCHOOLS THAT GRANT:</strong></td>
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<td>MD DEGREE 1ST TAKERS</td>
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<td>21071</td>
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<td>1ST TAKERS</td>
<td>20535</td>
<td>97</td>
<td>20140</td>
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<td>REPEATERS**</td>
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<td>931</td>
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<td>DO DEGREE 1ST TAKERS</td>
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<td>1ST TAKERS</td>
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<td>REPEATERS**</td>
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<td><strong>TOTAL US/CANADIAN</strong></td>
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<tr>
<td><strong>EXAMINEES FROM NON-US/CANADIAN SCHOOLS</strong></td>
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<td></td>
<td></td>
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<tr>
<td>1ST TAKERS</td>
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<td>80</td>
<td>11949</td>
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<td>REPEATERS**</td>
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<td>2342</td>
<td>50</td>
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<td><strong>TOTAL NON-US/CANADIAN</strong></td>
<td>15440</td>
<td>75</td>
<td>14291</td>
<td>76</td>
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</tbody>
</table>

*Data for Step 2 CK are provided for examinees tested during the period of July 1 to June 30.
**Repeaters represents examinations given, not number of examinees.
### TABLE 3 — 2015–2017* STEP 2 CLINICAL SKILLS ADMINISTRATIONS
NUMBER TESTED AND PERCENT PASSING

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td># TESTED</td>
<td>% PASSING</td>
</tr>
<tr>
<td>MD DEGREE</td>
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<tr>
<td>1ST TAKERS</td>
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<tr>
<td>REPEATERS**</td>
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<tr>
<td>REPEATERS**</td>
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<tr>
<td>TOTAL US/CANADIAN</td>
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<tr>
<td>EXAMINEES FROM NON-US/CANADIAN SCHOOLS</td>
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<tr>
<td>1ST TAKERS</td>
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<tr>
<td>REPEATERS**</td>
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<td>71</td>
</tr>
<tr>
<td>TOTAL NON-US/ CANADIAN</td>
<td>14351</td>
<td>81</td>
</tr>
</tbody>
</table>

*Data for Step 2 CK are provided for examinees tested during the period of July 1 to June 30.
** Repeaters represents examinations given, not number of examinees.
†Performance data not reported for categories containing fewer than 5 examinees.
N/A — not applicable.

### TABLE 4 — 2015–2017 STEP 2 CLINICAL SKILLS ADMINISTRATIONS*
FIRST TAKER PASSING RATES** FOR SUBCOMPONENTS: INTEGRATED CLINICAL ENCOUNTER (ICE), COMMUNICATION AND INTERPERSONAL SKILLS (CIS), SPOKEN ENGLISH PROFICIENCY (SEP)

<table>
<thead>
<tr>
<th></th>
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<td></td>
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<td>CIS</td>
</tr>
<tr>
<td>ALL US/CANADIAN SCHOOLS</td>
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<td>99</td>
</tr>
<tr>
<td>ALL NON-US/CANADIAN SCHOOLS</td>
<td>87</td>
<td>93</td>
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</table>

*Data for Step 2 CS are provided for examinees tested during the period of July 1 to June 30.
**>99 is used to signify those passing rates that would otherwise round up to 100%.
<table>
<thead>
<tr>
<th>EXAMINEES FROM US/CANADIAN SCHOOLS THAT GRANT:</th>
<th>2016</th>
<th>2017*</th>
</tr>
</thead>
<tbody>
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<td># TESTED</td>
<td>% PASSING</td>
</tr>
<tr>
<td>MD DEGREE</td>
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<tr>
<td>1ST TAKERS</td>
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<tr>
<td>Repeaters**</td>
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<tr>
<td>Repeaters**</td>
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<td>†</td>
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<td>Total US/Canadian</td>
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*Represents data for examinees tested in 2017 and reported through January 31, 2018.
**Repeaters represents examinations given, not number of examinees.
†Performance data not reported for categories containing fewer than 5 examinees.
USMLE Examination Committees

The high quality of the USMLE program is in large part due to the enormous effort of hundreds of volunteers who serve on USMLE committees. In addition to participation in test material development activities, medical school faculty members and practicing physicians serve on committees charged with item review, content-based standard-setting activities, test blueprint construction, form review, overall examination design and policy, and resolution of issues associated with examination security. Select committees developing test materials for the USMLE also provide guidance for staff in the development of the NBME subject examinations. The work of our test committee members in meeting the extraordinary standards of the national licensure examination program exemplifies the medical profession's tradition of public service.

Individuals who accept invitations to join USMLE test committees receive training in the development of USMLE-style test items and cases in several ways. Prior to their first committee meeting, members of multiple-choice-question TMDCs attend a two-day workshop at which they meet NBME staff and other new committee members; learn about issues related to content sampling, psychometric performance, and item difficulty and discrimination; and participate in a mock committee meeting during which test items they have written are discussed and edited. Members of the Step 3 Computer-based Case Simulation and the Step 2 CS TMDCs attend a half-day of training and orientation prior to their first committee meeting.

In addition, every year members of state medical licensing boards are invited to participate in a one-day workshop at the NBME headquarters to learn more about the program and the process of creating test materials. Usually one or more participants express an interest in joining test committees following this workshop. The USMLE is always interested in adding individuals with state licensure expertise to its pool of volunteers.

The USMLE program devotes considerable effort to ensuring that test committee members adequately represent the content areas required for medical practice as well as the realities of clinical practice. As a result, USMLE test committee members constitute a “national faculty” of medicine drawn from medical schools and clinical practice settings across the United States.

In 2017, 46 percent of committee members were women. Minority racial/ethnic groups made up 21 percent of members. Sixty-three percent held a medical degree, 30 percent held both a medical degree and another advanced degree, and 6 percent held the PhD degree alone. A small number held degrees in nursing or other related fields. In terms of geographic distribution, 37 percent were from the South, 24 percent from the Midwest, 24 percent from the Northeast, and 15 percent from the West. Four percent of our committee members were either current or former members of state licensing boards. Over the past 10 years, virtually all Liaison Committee on Medical Education (LCME)-accredited medical schools in the United States have been represented on committees supporting USMLE.

The NBME, and the profession and public served by the USMLE, are indebted to these volunteers who contribute their expertise and energy to the creation of a national licensing examination system that is without equal.

For a complete list of members for all NBME item-writing committees, please see the 2017 USMLE and NBME Committee Directory.

USMLE COMPOSITE COMMITTEE

Chair
ALFRED F. TALLIA, MD, MPH
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Vice-Chair  
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John A. Burns School of Medicine  
University of Hawaii at Manoa

JUDITH A. WESTMAN, MD  
The Ohio State University College of Medicine
The Clinical Skills Evaluation Collaboration

OUR MISSION
CSEC was formed in 2004 to evaluate and assess the clinical skills of medical students and physicians from the United States as well as international graduates. The cornerstone of our efforts is the creation and administration of the United States Medical Licensing Examination Step 2 Clinical Skills Examination (Step 2 CS), one of four examinations required for licensure in the US. Our mission is ensuring healthcare professionals demonstrate competence in communication and interpersonal skills, physical examination, clinical reasoning and decision-making, and spoken English proficiency.

CUSTOMIZED SERVICES
Providing customized services to medical schools domestically and internationally, CSEC offers consultative site visits for the evaluation of medical schools’ clinical skills programs. Hands-on, interactive workshops on the use of standardized patients (SPs) and clinical case development are conveniently facilitated by CSEC staff at the schools. These efforts assist academic medical centers in programs for faculty development to improve clinical skills assessment of students and graduates. Faculty feedback on these offerings continues to be very positive.

NEW TECHNOLOGY AND ENHANCED REALISM
Exciting new technologies and formats have been developed to enhance the cases portrayed by the SPs. In particular, we are developing new cases that will result in more true-to-life, realistic situations (including enhanced physical findings as well as pathological findings in a simulated environment).

ASSESSMENT CENTERS
CSEC operates six testing centers in five cities across the United States: Atlanta, Chicago, Houston, Los Angeles, and Philadelphia (two centers). We are currently exploring the use of our centers for high-stakes assessments for other examinees and situations.

In 2017, CSEC administered 34,876 examinations (21,208 US/Canadian medical graduates, and 13,668 international medical graduates).

CSEC BY THE NUMBERS
- Total test administrations, 2004–2017: more than 445,445
- Total SP Encounters, 2004–2017: approximately 5,465,460
- Highest number of test administrations in a calendar year: 36,030 (2015)
- Highest number of test administrations, international medical students/graduates, in a calendar year: 17,481 (2008)
CSEC OPERATIONS OVERSIGHT GROUP

NATIONAL BOARD OF MEDICAL EXAMINERS REPRESENTATIVES

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University of Kentucky College of Medicine

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National Board of Medical Examiners

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National Board of Medical Examiners

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Virginia Commonwealth University School of Medicine

Alternate

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University of Washington School of Medicine

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Fenwick Island, Delaware

ALBERT G. DEANA, CPA
Baker Tilly Virchow Krause, LLP
Philadelphia, Pennsylvania

DENNIS M. DONOHUE, CPA, MBA, MS
Educational Commission for Foreign Medical Graduates

RAM R. KRISHNA, MD
Yuma, Arizona

WILLIAM W. PINSKY, MD
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Alternate

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Research Triangle Park, North Carolina

Clinical Skills Evaluation Collaboration Representative

KIM E. LEBLANC, MD, PHD
Clinical Skills Evaluation Collaboration

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Dubuque, Iowa

PETER J. KATSUFRAKIS, MD, MBA
National Board of Medical Examiners

EDUCATIONAL COMMISSION FOR FOREIGN MEDICAL GRADUATES REPRESENTATIVES

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Yuma, Arizona

WILLIAM W. PINSKY, MD
Educational Commission for Foreign Medical Graduates

Clinical Skills Evaluation Collaboration Representative

KIM E. LEBLANC, MD, PHD
Clinical Skills Evaluation Collaboration
The North American Veterinary Licensing Examination® (NAVLE®)

The NAVLE, co-sponsored and co-owned by the ICVA (International Council for Veterinary Assessment) and the NBME, is a requirement for licensure to practice veterinary medicine in all licensing jurisdictions in North America. The NAVLE is overseen by the Collaboration for Veterinary Assessments (CVA) Governance Committee, comprising members appointed by the ICVA and the NBME.

Additional assessments offered by the ICVA include:

- The NAVLE self-assessment
- The Veterinary Educational Assessment (VEA)
- Species-specific examinations for small-animal and equine medicine
- The Wisconsin State Laws and Rules Examination

The following summary includes examinee performance data and highlights of significant collaboration activities in 2017.

NAVLE ADMINISTRATION AND MINIMUM PASSING SCORES

NAVLE is available during a four-week testing window in November and December, and a two-week window in April, domestically and internationally, and is offered in both English and French. A pass or fail result is provided for each examinee.

VETERINARY PRACTICE ANALYSIS

In the summer of 2017, ICVA and NBME completed the veterinary practice analysis to define knowledge and skills that are essential for competent practice. Activities included:

- A final practice report was created and distributed to key stakeholders in October 2017.
- Changes were made to the NAVLE blueprint, which will begin to be reflected in the 2019 NAVLE administration.
- NBME staff presented results of the practice analysis to several groups:
  - Executive directors of state, territory, and province licensing agencies at the American Association of Veterinary State Board’s annual meeting.
  - Via webinar to United States and Canadian licensing agency representatives.
  - Via webinar to the Canadian Council of Veterinary Registrars.

COLLABORATION FOR VETERINARY ASSESSMENTS GOVERNANCE COMMITTEE

The CVA agreement created a CVA Governance Committee (CVA GC), comprising five members from each organization. The Governance Committee, in conjunction with the parent organizations, governs the administration and operation of NAVLE. The CVA GC set the following goals for the program for 2018:

- Form a communications task force to investigate how more communications items can be added to the NAVLE.
- Meet stated CVA GC program research goals for 2018, including:
  - Explore redesign priorities for the NAVLE Score Reports.
  - Engage in validity research related to (1) positive outcomes in veterinary practice and (2) demographic performance differences among NAVLE examinees.
  - Explore incorporation of video items into NAVLE — focused on visual diagnosis.
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<td>5415</td>
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1. Criterion group: senior students of accredited veterinary schools who took the NAVLE for the first time under standard testing conditions.
2. Non-criterion group: senior students of accredited veterinary schools who had previously taken the NAVLE or took the NAVLE with test accommodations or graduate veterinarians from accredited schools.
3. Non-accredited group: graduates or senior students of foreign veterinary schools that are not accredited by the American Veterinary Medical Association’s Council on Education.
Post-Licensure Assessment Services

The Post-Licensure Assessment System (PLAS) is a joint activity of the NBME and the FSMB. The PLAS was developed to assist medical licensing authorities in their competency assessment of previously licensed physicians. Physicians can participate in an assessment either by self-referral or third-party referral. PLAS includes the Special Purpose Examination (SPEX®) and other resources for clinical competence assessment.

Key program highlights for 2017 include:

- FSMB and NBME agreed to disband the prior governance and program committee structure for PLAS, and a new SPEX Oversight Committee (SOC) was formed.
  - The SOC comprises four USMLE Composite Committee members and four USMLE Management Committee members, as SPEX exam design, standard setting, and score reporting will benefit from closer linkage to USMLE operations.
  - The Assessment Center Programs will be managed by PLAS staff.
- In April 2017, a pilot project was conducted that permitted a small number of individuals enrolled in the Physician Retraining and Reentry program to sit for USMLE Step 2 CS.

Special Purpose Examination (SPEX)

- In 2017, 153 examinees took the SPEX. Previous years’ volume was 129 (2016) and 173 (2015).
- SPEX was migrated to a new computer driver in the summer of 2017. This new driver introduced additional accessibility features.

Assessment Center Activities

- The PLAS program continues to provide a toolbox of assessment services to third-party collaborators at eight different locations.
- In 2017, 173 physicians received assessments through the assessment center network. This is comparable to 2016, when 168 physicians received assessments through third-party collaborator sites.
- Computer-based case simulation cases were refreshed and deployed for assessment center use in the spring of 2017.
Health & Wellness Coach Certifying Examination™
(HWCCE™)

For the past several years, NBME has collaborated with the International Consortium for Health & Wellness Coaching (ICHWC) to develop a new certification exam: the Health & Wellness Coach Certifying Examination (HWCCE). As the field of health coaching grows nationwide, and practitioners are trained by an increasingly wide variety of programs, there is also a growing need for a national standard that defines minimum competence in a health coach, giving potential clients the confidence that the partners they choose are well-suited to the task. The new credential allows stakeholders such as healthcare professionals, employers, and educators to identify practitioners who have demonstrated knowledge, skills, and abilities essential to effective health and wellness coaching.

The new exam has been designed to set minimum standards for competence in areas such as the coaching relationship, communications techniques, processes for behavior change, ethics, professionalism, and more. Test items are developed by nationally recognized subject-matter experts who are experienced as practitioners and educators in the field. Examination content draws upon the results of a 2014 job task analysis and broadly represents the principles of health and wellness coaching, teaching, and practice. Participants who pass the exam, and who have also completed a training program approved by ICHWC and achieved a significant number of coaching hours, will be designated National Board Certified Health & Wellness Coaches (NBC-HWC).

More than 1,200 examinees sat for the pilot administration of the HWCCE in September 2017. The next administration will take place nationwide in June 2018, and by the end of the year, we hope to see more than 2,000 National Board Certified Health & Wellness Coaches listed in a new public directory on the ICHWC website.

NATIONAL BOARD FOR HEALTH AND WELLNESS COACHING

AGGIE BUTLER, PHD
National Board of Medical Examiners

PETER J. KATSUFRAKIS, MD, MBA
National Board of Medical Examiners

CRAIG MILLS, EDD
National Board of Medical Examiners

MARGARET MOORE, MBA
Harvard Extension School

CINDY SCHULTZ, MA, LP
University of Minnesota

RUTH Q. WOLEVER, PHD
Vanderbilt University School of Medicine
Assessments for Other Purposes

Subject Examinations

Subject Examinations are standardized and objective exams for use in assessment throughout the medical school curriculum. They are designed to provide institutions with effective evaluation tools and useful examinee performance data. The performance data can be compared with a large representative group of examinees at the same stage of training, and it compares student performance with a national reference group of US and Canadian medical students. These examinations are available globally to medical schools and institutions with a legitimate interest in the education of physicians or other health professionals.

PROGRAM HIGHLIGHTS FOR 2017

- The program saw modest growth, with the total number of exams administered domestically and internationally exceeding 253,000. Over 32,000 of these examinations were administered at Prometric testing centers, an increase of approximately 3,000 administrations over 2016.
- The Emergency Medicine Advanced Clinical subject exam is also now offered for administration at Prometric testing centers.
- All basic science subject examinations were rescaled to report equated percent correct scores. The move to equated percent correct scores enables faster score turnaround for new exam forms.

Customized Assessment Services

The NBME introduced the Customized Assessment Services (CAS) program in 2007 in response to the presence of integrated pre-clinical curricula at many US medical schools. The CAS program allows faculty to build high-quality, standardized assessments targeted to local curricula using secure NBME item banks. The most common use continues to be for evaluation at the end of a discipline- or systems-based course or shorter instructional block. Other uses include end-of-year comprehensive assessments, basic science progress tests administered at set intervals, remedial exams, and tests to evaluate student learning in a case-based curriculum.

The CAS program continued to experience steady growth in the number and mix of schools using the service. In 2017, 99 medical schools subscribed to CAS, including 16 international schools. A total of 1,040 examinations were created and administered to over 102,000 examinees in 2017. The growth in the number of CAS administrations per year appears in the following figure.

![CUSTOMIZED ASSESSMENT SERVICES (CAS) USAGE 2013–2017](chart_url)
The NBME offers a variety of web-based self-assessment services to medical students and graduates. The Comprehensive Basic Science Self-Assessment (CBSSA), Comprehensive Clinical Science Self-Assessment (CCSSA), and Comprehensive Clinical Medicine Self-Assessment (CCMSA) help students to evaluate their readiness to take the USMLE, and resemble the content on Step 1, Step 2 Clinical Knowledge, and Step 3 examinations respectively. The Clinical Science (CS) Mastery Series allows examinees to gauge their comprehension of the clinical sciences covered during a clerkship or medical education course. They are built to the same content specifications as the NBME clinical science subject exams.

A few of the highlighted benefits of the self-assessments include the ability to test with content and item formats that once appeared on USMLE or the subject exams, diagnostics that highlight strengths and opportunities for improvement, and the ability to measure individual progress through longitudinal feedback.

In 2017, there were several changes implemented to the self-assessments based on recommendations from students. Individuals now have the ability to review the correct answers for incorrectly answered items for CBSSA, CCSSA, and CCMSA. In addition, the CS Mastery Series, which included medicine, clinical neurology, obstetrics and gynecology, pediatrics, psychiatry, and surgery, was expanded to include family medicine and emergency medicine.
International Programs

The goal of International Programs is to foster an international understanding of the value of high-quality assessment in evaluating educational programs and assessing knowledge, as well as to serve medical schools and other organizations in improving their healthcare assessment systems. We approach this goal in various ways — through NBME products such as subject examinations, self-assessments, and the International Foundations of Medicine program (IFOM); through the creation of exams tailored to specific schools' or countries' needs; through consulting services; and through other collaborations with international organizations.

The IFOM program consists of two examinations. The Clinical Science Examination (CSE) covers the core of clinical knowledge in medicine, surgery, pediatrics, obstetrics and gynecology, and psychiatry expected of students in the final year of undergraduate medical education. The Basic Science Examination (BSE) incorporates the common core of knowledge expected of students who have completed the pre-clinical curriculum and are about to begin the study of clinical medicine. NBME also offers an IFOM CSE Self-Assessment Examination intended as preparation for taking the IFOM CSE or other similar exams, and for personal benchmarking.

High-quality, valid, and reliable assessment is a universal goal for healthcare professionals. Our work is most rewarding because of the collaborations and the relationships we build with colleagues around the world.

2017 Highlights

COLLABORATIONS

• The collaboration with the Hospital-Sírio Libanês in São Paulo, Brazil continues and is largely responsible for the success of the new Qualifications in Medicine (QM) examinations.
  • The Qualifications in Medicine (QM) examinations were developed and administered to 3,300 examinees in Brazil.

• NBME staff had three different meetings with the National Health and Family Planning Commission (former Ministry of Health) in China to discuss collaboration opportunities and potential sponsorship of the Professional Examination for the Health Coach (PEHC).

• NBME staff was invited to make presentations of the PEHC examination results at two international conferences held in China.

• NBME staff conducted workshops about standard setting, item development, the IFOM examinations, and the USMLE with medical school representatives and regional assessment center representatives in Astana, Kazakhstan.

• NBME staff held a meeting with the Minister of Health of Kazakhstan to discuss NBME collaboration to develop quality assessments for healthcare professionals in Kazakhstan.

• NBME partnered with the Ministry of Health of Ukraine and the country’s Testing Board to conduct the largest-ever administration of the International Foundations of Medicine (IFOM) Clinical Science Exam (CSE) — the exam was given on paper, in Ukrainian, to 3,000 graduating medical students at 14 medical schools across the country. Planning is now underway to administer IFOM to the full cohort of graduating medical students in Ukraine (about 6,000) in 2018 or 2019.

• IFOM CSE was used for the second year in Costa Rica as a nationwide internship selection exam and continues to be used in Panama for the same purpose.
INTERNATIONAL FOUNDATIONS OF MEDICINE (IFOM)

Since 2007 the IFOM examination program has addressed two needs expressed by international medical school faculty and students: 1) the need for a measurement tool that would allow faculty to evaluate applicants trained in other schools in their country or in other countries; and 2) the need students expressed for an internationally accepted certificate they could include in their portfolios when applying for residency programs, rotations, or exchange opportunities in other institutions and/or countries.

- 2017 brought healthy growth in International Foundations of Medicine (IFOM) examination usage, with the number of examinees served growing 26 percent over 2016.
- A number of process improvement projects were initiated in 2017 to increase the efficiency and cost-effectiveness of the IFOM program. These include an effort to standardize and automate the production of IFOM score reports and an effort to standardize the process for setting up large, non-standard IFOM administrations, which can be extremely time-consuming for NBME staff.
- Due to increased interest in and usage of the IFOM Basic Science Exam (BSE), including from medical schools in Spanish-speaking Latin America, NBME convened a multidisciplinary, globally representative group of physicians and scientists with special expertise in the basic medical sciences to create the first new IFOM BSE in three years. This new exam is available in both Spanish and English.
- Additional information about examination content and sample feedback can be found on the NBME website at www.nbme.org/ifom.

MARKETING

- NBME International activities were on display at two international conferences — AMEE in Helsinki, Finland, and the 4th International Conference in Medical Education held in Monterrey, Mexico.
- Staff created a new brochure describing programs and services that are offered globally that is now available and is used at conferences and for international visitors.

RELATIONSHIP BUILDING

- The meetings of the International Oversight Committee and the IFOM Test Committee were held in Doha, Qatar, hosted by the University of Qatar.
- Staff hosted and learned a great deal with visitors from the Ministry of Health of Vietnam; the Ministry of Health of China; and the Saudi Commission for Health Specialties.
- Staff of NBME International Programs and the Foundation for Advancement of International Medical Education and Research (FAIMER) have begun conversations about potential areas for collaboration.
- The Latin America Grants Program was reinitiated in 2017, based on the very successful 2015 Centennial Grants Program. The goal of the program is to enhance the quality of student evaluation in health professions education in Latin America. We received 13 proposals representing consortia of schools in Mexico, Chile, Argentina, and Brazil.
- We have been pleased and gratified to continue our partnerships with many medical schools around the world, which use the IFOM exams for various purposes, including to test students’ knowledge before or after phases of education or training, for evaluation of curricula or assessments, for progress testing, and to select candidates for exchange programs or postgraduate training.

For more information on NBME International Programs, please visit www.nbme.org/global.
INTERNATIONAL OVERSIGHT COMMITTEE

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Singapore

ALISON J. WHELAN, MD
Association of American Medical Colleges
Washington, DC
USA
## Assessment Services for Health Professions and Medical Schools

### Overview of NBME Assessment Services

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Services Offered</th>
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<tbody>
<tr>
<td><strong>Examination Development</strong></td>
<td>• Conduct practice analyses</td>
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<td></td>
<td>• Develop content specification and examination blueprints</td>
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<td></td>
<td>• Select appropriate examination methods</td>
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<tr>
<td><strong>Item Development</strong></td>
<td>• Provide item-writing workshops</td>
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<td></td>
<td>• Edit materials for style and clarity</td>
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<td></td>
<td>• Integrate complex multimedia in test questions</td>
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<td></td>
<td>• Facilitate item and form review meetings</td>
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<tr>
<td><strong>Examination Publishing</strong></td>
<td>• Compose examination forms</td>
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<td></td>
<td>• Publish examinations for computer administration</td>
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<td></td>
<td>• Prepare tutorials and practice examinations</td>
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<tr>
<td><strong>Examination Administration</strong></td>
<td>• Prepare candidate brochures and proctor manuals</td>
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<td></td>
<td>• Assist in identifying test sites</td>
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<td>• Implement requested test accommodations</td>
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<td>• Monitor and assist with test-day issues</td>
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<td><strong>Psychometric Services</strong></td>
<td>• Review item statistics</td>
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<td></td>
<td>• Validate answer keys</td>
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<td></td>
<td>• Score examinations</td>
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<td>• Equate test scores</td>
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<td>• Facilitate pass/fail standard setting</td>
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<td></td>
<td>• Prepare and distribute score reports</td>
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<tr>
<td><strong>Research &amp; Special Services</strong></td>
<td>• Create and administer surveys</td>
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<tr>
<td></td>
<td>• Collaborate on research studies and other initiatives</td>
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<td></td>
<td>• Consult on strategic evolution and future plans</td>
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<tr>
<td></td>
<td>• Prepare for accreditation reviews (ANSI, NCCA)</td>
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<td></td>
<td>• Present seminars on selected topics</td>
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</tbody>
</table>
The NBME provides a wide range of assessment services to both medical schools and health professions organizations around the world to meet their unique assessment needs throughout the continuum of education, training, and practice. While individual assessment requirements may vary, the organizations with whom we work share similar missions. Each organization brings its unique expertise and perspective on healthcare practice and provides deep understanding and content expertise in its particular field. Some examination programs are co-owned, some are supported through fee-for-service contracts, and others are owned by NBME. Working together with stakeholders, we achieve mutual goals through combined expertise, collaboration, and continuous monitoring of examinee and examination sponsor needs. To find organizations that work with NBME and for additional information, please visit www.nbme.org/health-profession-services.

2017 Health Professions Highlights

- For many years, the NBME worked with the American Board of Addiction Medicine (ABAM) to develop and administer their Addiction Medicine Certification Examination. In March 2016, ABAM announced the recognition of addiction medicine as a multispecialty subspecialty by the American Board of Medical Specialties (ABMS) and transferred examination oversight to the American Board of Preventive Medicine (ABPM). Beginning in 2017, NBME and ABPM agreed to work together to support the Addiction Medicine Examination as well as additional certification exams in aerospace medicine, clinical informatics, occupational medicine, public health/general preventive medicine, undersea and hyperbaric medicine, and core knowledge.

- NBME staff co-presented with the American Board of Obesity Medicine (ABOS) at the ABMS Conference 2017 on the topic: “Obesity Medicine: Building Credibility and Seeking Certification in a Stigmatized Field.” During the same conference, staff co-presented with ABOS during a poster session on the topic: “A Fresh Perspective: Examination Blueprint Development.” NBME also entered into an agreement with the American College of Physicians (ACP) and the American Board of Internal Medicine (ABIM) to collaborate on a predictive validity study that looks at relationships between performance on the USMLE, ACP In-Training Examination, and ABIM Certification Examinations.
Medical School Liaison Engagement

The medical school liaison program provides a designated contact between the NBME and individual medical schools, students, and residency programs. Activities have focused on communication with stakeholders through presentations, exhibits, social media, surveys, and web-based conferences, as well as attendance at national and regional meetings of the Association of American Medical Colleges (AAMC), academic societies, and medical student organizations. In addition to presentations and manuscripts listed on pages 69–75, specific outreach activities in 2017 included:

- Webcasts for schools interested in learning about the new score scale changes to the basic science examinations.
- Orientation webcasts for institutions interested in learning about the activities involved in preparing for and administering an NBME web-based examination and visits with medical schools new to NBME services.
- Exhibits highlighting NBME services at conferences, including the conferences of the American Medical Student Association, Association of American Medical Colleges, Association of Medical Educators in Europe, International Association of Medical Science Educators, Latino Medical Student Association, and Student National Medical Association.
- Educational workshops for schools and students related to the future of evidence-based assessment, including the role of innovations and limitations of assessment modalities and the evolution of assessment of non-traditional competencies.
- Focus groups to obtain feedback on potential new initiatives as well as to identify underlying needs related to assessments.
- Surveys to various constituencies about the use of current and new services.

Medical school faculty from academic and medical associations and representatives from major student organizations serve on the Advisory Committee for Medical School Programs. This committee is charged to improve communication and to enhance relationships between the medical education community and the NBME in areas of mutual interest. The committee is structured to systematically obtain views from various segments of the medical education community.
RESEARCH & FUTURE DIRECTIONS
To better fulfill its mission in the coming decades, NBME has been reviewing ways that it can advance and complement existing services, reach a broader global public, and leverage its capabilities as an assessment organization. That promise will be met through new ideas for assessment in existing and new markets, with both traditional tests and novel assessments as well as through high-quality research.

The NBME’s research enterprise, broadly defined, underpins the NBME brand, reputation, current products, and future prospects. It comprises structures, processes, and individuals throughout the organization and connects with outside experts and institutions as colleagues and collaborators. This includes:

- Exploring influential and disruptive trends and technologies and their implications.
- Identifying needs and opportunities from our customers and stakeholders.
- Brainstorming opportunities for introducing novel assessment capabilities.
- Evaluating prospects for new products.
- Prioritizing and driving a research agenda that strengthens the inferences made with existing products, contributes to knowledge in the field, and informs the most promising measurement opportunities that can serve stakeholders’ needs.
Looking Out for the Future

The NBME has multiple corridors for conducting a range of research and development activities. Two drivers of future thinking include the Strategic Futures Committee and the Center for Advanced Assessment Advisory Committee.

Strategic Futures Committee (SFC)

The SFC analyzes trends from environmental scanning and envisions possible future states. Its function is to deliver advice to the NBME about strategic issues of potential importance, and to guide staff exploration. SFC members for 2017 were as follows:

Acting Chair

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Davidson, North Carolina

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Uniformed Services University of the Health Sciences, F. Edward Hébert School of Medicine

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PAUL R. G. CUNNINGHAM, MD
The Brody School of Medicine at East Carolina University

N. LYNN ECKHERT, MD, MPH, DRPH
Partners Healthcare International
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ERIC KINGSBURY, MBA
Scottsdale, Arizona

CAPTAIN ELIZABETH MCGUIGAN, MD
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F. Edward Hébert School of Medicine

RINI B. RATAN, MD
Columbia University College of Physicians and Surgeons

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Connecticut Center for Patient Safety
Redding, Connecticut

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University of Washington School of Medicine

DAVID ZAHN
Signal Advertising
East Calais, Vermont

NBME STAFF

CRAIG MILLS
JONATHAN RUBRIGHT
Center For Advanced Assessment (CAA)

During 2017, Measurement Consulting Services transitioned to become the Center for Advanced Assessment. This transition has involved a shift from concentration on a number of operational activities (such as standard setting to USMLE) to responsibility for an agenda designed to provide the NBME with the advanced assessment capabilities that we believe will be necessary to meet the goals of NBME 2030. The research agenda is, most importantly, designed to ensure that the NBME is viewed as the leader in the field of assessment in healthcare. More practically, the agenda is designed to 1) improve the efficiency and quality with which we develop and administer our current assessments, and 2) provide the measurement technology to support the development of new products.

The CAA is targeting a number of areas for further research. Among them are:

- Technology to support test materials development — research activities focused on improving item writing efficiency while maintaining or improving quality. Directions for research include automated item generation, and predicting difficulty and response time in order to reduce the need for extensive pretesting.
- Natural language processing to score Step 2 CS patient notes.
- Non-cognitive assessment including enhancements to the Step 2 CS communication component (to measure a broader range of communication skills) and Video Communication Assessment (VCA), designed to help providers become better communicators.
- Additional approaches including forced-choice formats; observational assessment; simulations; interviews; and assessments completed by supervisors, colleagues, or patients, in order to assess constructs such as interpersonal skills and professionalism as well as a range of personality characteristics that have been shown to be important for success in the healthcare professions.

CENTER FOR ADVANCED ASSESSMENT ADVISORY COMMITTEE

<table>
<thead>
<tr>
<th>NAME</th>
<th>ROLE/INSTITUTION</th>
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<tbody>
<tr>
<td>EUGENE BURKE</td>
<td>Advisor, Alderbrooke Group</td>
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<tr>
<td>London, United Kingdom</td>
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<tr>
<td>FRITZ DRASGOW, PHD</td>
<td>Dean and Professor</td>
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<tr>
<td>University of Illinois at Urbana-Champaign</td>
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<tr>
<td>ERIC KINGSBURY, MBA</td>
<td>Senior Product Marketing Manager</td>
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<td>Experian</td>
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<tr>
<td>MARGARET M. LUCIANO, PHD, MBA</td>
<td>Assistant Professor</td>
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<tr>
<td>Arizona State University</td>
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<tr>
<td>W. P. Carey School of Business</td>
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<tr>
<td>RICHARD LUECHT, PHD</td>
<td>Professor, Educational Research Methods</td>
</tr>
<tr>
<td>University of North Carolina, Greensboro</td>
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<tr>
<td>LIBERTY MUNSON, PHD</td>
<td>Microsoft Learning Experiences</td>
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<tr>
<td>Psychometrician and Assessment &amp; Exam Quality Lead</td>
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<tr>
<td>JEFFREY M. TAEMAN, M.D.</td>
<td>Professor of Anesthesiology</td>
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<tr>
<td>Duke University Medical Center</td>
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<tr>
<td>MARK DAVID SHERMIS, PHD</td>
<td>Dean and Professor, School of Education</td>
</tr>
<tr>
<td>University of Houston—Clear Lake</td>
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The new product development (NPD) process conceptualizes and refines new product and service ideas to meet healthcare assessment needs and to more completely fulfill our mission. It is informed by engagement of stakeholders and input from potential users and aims to deliver services based on their impact and sustainability. Assessment Programs, Product Discovery, and Marketing support this effort.

NPD is structured as a funnel-shaped pipeline with five stages: exploration, conception, prototyping and market testing, development, and launch. In between each stage is a decision gate (denoted as “DG” in the figure) where the new product or service idea is evaluated against a standard set of criteria before it is allowed to enter into the next stage of the pipeline. Since each successive stage represents substantially increased investment, the criteria are applied with increasing rigor and with the expectation of increased certainty to ensure that only the most promising ideas are selected.
Pediatrics Milestones Assessment Collaborative (PMAC)

The Pediatrics Milestones Assessment Collaborative is a joint effort by the NBME, American Board of Pediatrics, and Association of Pediatric Program Directors to develop a coherent system of competency-based assessment for physicians aimed ultimately across the educational and practice continuum.

The assessment content currently is linked to decisions that will be made about learners’ readiness for increasing levels of responsibility/decreasing levels of supervision as they advance from medical school through residency.

Development activities to this point have focused on: 1) readiness to serve in the inpatient setting without the presence of a supervisor; 2) readiness to serve as a first-year intern in the inpatient setting; and 3) readiness to supervise a clinical team. Initial evaluation of assessment outcomes shows that the system produces reliable scores that can be used to support decisions about learners.

Research and development supporting this workplace-based assessment continued to progress in 2017.

- Data collection was completed to support the inference “readiness to serve as a resident in the inpatient setting with supervision.”
  - Analysis showed high reliability (reliability ≥ 0.80 with 4–6 evaluations returned per learner). These results are in line with those found at the conclusion of previous work, supporting the inference of “readiness to provide patient care with supervision at a distance.”

- Content development, site recruitment, and initial data gathering began to support the inference “learner readiness to supervise a clinical team.”

- Market research was conducted to better understand the needs of customers interested in workplace-based assessments.

Assessment of Clinical Research Professionals

Over the past several years, based on an evaluation of the professional landscape and the support of key stakeholders, NBME developed two certification exams designed to support a baseline of common knowledge and minimum competence in the diverse field of clinical research. However, low registration for two pilot administrations did not provide a sufficient cohort to set the scoring standard for the examinations, and indicated that the exams were not meeting an immediate need in the field. After considering a range of options, NBME made the decision to suspend the program and to reevaluate its prospects.
While NBME’s research enterprise is spread throughout the organization, coordinating research efforts is the responsibility of the Office of Research (TOR) and the Research Implementation Committee (RIC). Together TOR and RIC ensure the alignment of NBME research with institutional priorities. TOR supports the RIC, administers the Stemmler Medical Education Research Fund, and ultimately aims to enhance NBME product quality, reputation, and the attraction and retention of talent through its research enterprise.

TOR is responsible for administering NBME’s summer predoctoral internship program in Psychometrics and Assessment Science. In 2017, more than 80 applications were received for four positions. The four interns who spent the summer at NBME will be presenting their project reports at national conferences in the coming year.
Edward J. Stemmler Medical Education Research Fund

The Stemmler Fund was established in 1995 and subsequently named in honor of Dr. Edward J. Stemmler, who was largely responsible for the conception of the program while chair of the NBME. The goal of the Stemmler fund is to provide support for research or the development of innovative assessment approaches that will enhance the evaluation of those preparing to, or continuing to, practice medicine. Since its inception, the Stemmler Fund has awarded 85 grants for a total of approximately $8 million.

During the 2016–2017 grant cycle, 60 letters of intent were reviewed by the Stemmler Fund Steering Committee. In March 2017, the Committee met to review proposals and made three award recommendations:

**UNIVERSITY OF OTTAWA**
Principal Investigator: Douglas Archibald, PhD
Grant Amount/Duration: $102,605 over two years
Project Title: *Harnessing Practice Based eHealth Technologies and Assessments to Improve Feedback and Promote Reflection*

**REGENTS OF THE UNIVERSITY OF MINNESOTA**
Principal Investigator: Robert Englander, MD, MPH
Grant Amount/Duration: $149,673 over two years
Project Title: *Shared Mental Models and Learner Outcomes: Gap Filling of Validity Evidence to Support Time Variable Competency-Based Advancement*

**UNIVERSITY OF TORONTO**
Principal Investigators: Kulamakan Kulasegaram, PhD, and Anna Ryan, PhD, MBBS
Grant Amount/Duration: $137,808 over two years
Project Title: *Timing and Content of Feedback for Test-Enhanced Learning: A Multi-Institutional Experiment*

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Tampa, Florida

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Albert Einstein College of Medicine

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Harvard Medical School

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DAVE SWANSON, PHD
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CAROL MORRISON, PHD
MARK RAYMOND, PHD
THOMAS REBBECCHI, MD
KIMBERLY A. SWYGERT, PHD
TIME Conference

In October 2017, NBME hosted the Timing Impact on Measurement in Education (TIME) conference, a two-day meeting that provided a forum for scholars in psychometrics, cognitive science, and education to share research and perspectives on timing and pacing for high-stakes tests, and to discuss the implications of timing considerations for policy and practice. The conference aimed to address a wide range of topics related to examination timing, including policy considerations, empirical research on time limits, modeling response time, collateral uses of response time (e.g., examinee engagement), and the extent to which speed of processing should be part of the construct for high-stakes tests.

NBME’s Research Implementation Committee (RIC) worked to develop the conference content and layout for well over a year. The conference included sessions with invited speakers, as well as a poster session and panel discussions. The event was a resounding success, and most of the conference material presented will soon be available in a book, edited by Melissa Margolis and Rich Feinberg and tentatively scheduled to go to press in late 2018. NBME was delighted to sponsor this inaugural conference as a contribution to advancing assessment science, and we look forward to the upcoming publication.

“The TIME conference was a spectacular success. Multiple psychometricians I spoke with noted that the conference focus was an important topic, and that the NBME was making a substantial contribution to research with the diverse and accomplished speaker lineup and the ambitious, creative program. Both speakers and audience members felt proud to be a part of this!”

KIMBERLY SWYGERT, RIC member and panel moderator
KEYNOTE ADDRESS
Michael Kane, ETS
The Impact of Time Constraints on Validity

IMPLICATIONS OF RESEARCH FOR POLICY AND PRACTICE I
Eileen Talento-Miller, GMAC; Stephen Sireci, University of Massachusetts Amherst
Issues and Practices in Test Speededness: An Historical Perspective and Empirical Analyses

Wayne Camara and Deborah Harris
ACT Score Comparability and Timing in Dual Mode Programs

Cynthia Searcy and Marc Kroopnick, AAMC
Association Between Extended Time on the MCAT Exam and Medical School Admissions and Medical Student Performance

RESPONSE TIME REQUIREMENTS AND IMPLICATIONS FOR CONSTRUCT VALIDITY I
Benjamin Lovett, SUNY Cortland
Speededness: What Is It Good For?

Patrick Kyllonen, ETS
Promising Applications of Response Time Methods for High-Stakes Testing Programs

Rick Thomas, Georgia Institute of Technology
The Effects of Time Pressure, Executive Function, and Experience on Diagnostic Hypothesis Generation, Evaluation, and Testing: Theory and Experimental Evidence

IMPLICATIONS OF RESEARCH FOR POLICY AND PRACTICE II
Polina Harik, NBME
Timing and Examinee Pacing on a Test of Physician Licensure: Experimental Findings

Brent Bridgeman, ETS
Summary of Timing Research Conducted by ETS

Brian Clauser, NBME
Timing Issues in Simulations, Games, and Other Performance Assessments

RESPONSE TIME REQUIREMENTS AND IMPLICATIONS FOR CONSTRUCT VALIDITY II
Wim van der Linden, Pacific Metrics
Test Design and Speededness

Paul De Boeck, Ohio State University
The Nature of Measured Cognitive Abilities Changes With the Speed of the Responses: What to Do?
Frank Rijmen, AIR
Implications of Research in Cognitive Psychology and Psychometric Modeling for Testing Practice

COLLATERAL USES OF RESPONSE TIME DATA
Steven Wise, Northwest Evaluation Association
A Cessation of Measurement: Identifying Test-Taker Disengagement Using Item Response Time

Seo Young Lee and James Wollack, University of Wisconsin-Madison
Use of Response Time for Detecting Security Threats and Other Anomalous Behaviors
2017 Research Summary: A Sampling of NBME Research

HOW DOES TAKING USMLE STEP 1 AFTER COMPLETING CLINICAL CLERKSHIP AFFECT STUDENT TEST PERFORMANCE?

BACKGROUND
Schools are reconsidering the optimal timing of Step 1. Moving Step 1 after core clerkships may facilitate earlier entry into clinical environments, promote retention of basic science content, and encourage foundational science learning linkage to clinical care. This study examines the impact of this change on Step 1 scores for four schools by comparing data three years before and after the change.

RESULTS
Students from schools adopting the change in Step 1 timing performed significantly better compared to pre-change. In addition, these schools demonstrated larger score increases than similar schools in the same timeframe, although the score increase was small. Fail rates also decreased post-change.

WHY THIS MATTERS
Although the score increase associated with moving Step 1 after core-clerkships is very small, results indicate that this curricular change has no negative impact on Step 1 scores. This demonstration of “non-inferiority” may be liberating for institutions and educators looking to implement this type of curricular reform. Results will be submitted for publication in 2018.

CONTACT
Daniel Jurich, djurich@nbme.org

DO PATIENT CHARACTERISTICS (E.G., RACE, GENDER) IN TEST ITEMS AFFECT HOW DIFFERENT GROUPS OF EXAMINEES RESPOND?

BACKGROUND
Item writers work hard to craft realistic and clinically relevant vignettes. This sometimes means including patient characteristics such as race, ethnicity, and occupation. On one hand, such information can be relevant to patient management (e.g., Ashkenazi Jews have an increased risk for Tay-Sachs). On the other, it may promote social stereotypes or introduce construct-irrelevant variance. This study involves creating alternate versions of items either by adding, removing, or altering the patient characteristics in existing test items (e.g., add gender; remove gender; or change the gender). The purpose of pretesting variations of each item is to determine whether specific patient characteristics alter examinee response tendencies.

RESULTS
Test item statistics (difficulty, discrimination, and response time) will be compared for original and alternate items for the total group, as well as for subgroups of examinees.

WHY THIS MATTERS
The results could inform test development practice in a variety of ways (e.g., if race does not matter, why include it?), and reveal useful information about how different groups of medical students treat the “patients” they encounter in test items (e.g., are military veterans requiring pain medication treated differently?).

CONTACT
Miguel Paniagua, mpaniagua@nbme.org
DOES PERFORMANCE ON USMLE VARY BY DEMOGRAPHIC GROUP?

BACKGROUND
We evaluated USMLE scores (Step 1, Step 2 CK, and Step 3) for examinees testing between 2010 and 2015. Examinee characteristics included self-reported gender, race, International Medical Graduate status, US citizenship, whether English is a second language, MCAT scores, undergraduate GPA, and age at first Step 1 attempt.

RESULTS
Models examined demographic variables with and without covariates including age, MCAT scores, and GPA. All Step examinations showed statistically significant differences in mean scores by gender both before and after adding covariates, although the direction of the difference varied by Step. Racial differences were also observed for each Step, with the differences shrinking considerably by the addition of covariates.

WHY THIS MATTERS
Group differences in USMLE performance have persisted over two decades. Although most of the differences can be attributed to group differences on the covariates, additional research is required to identify other factors that 1) contribute to demographic differences, 2) can aid medical educators’ identification of students who would benefit from assistance preparing for USMLE, and 3) can assist residency program directors in using performance measures while also meeting diversity goals. This study has been submitted for publication and presentation.

CONTACT
Jonathan Rubright: jrubright@nbme.org

ARE TEST SCORES BETTER THE SECOND TIME AROUND?

BACKGROUND
Most testing programs allow examinees who fail on their first attempt opportunities to retake. However, relatively little is known about the magnitude and credibility of the score gains for medical licensure exams. This study evaluated score increases on all three Steps of USMLE to determine the amount of score gain that could be explained by measurement error and whether second-take scores were less consistent with expectations (e.g., less correlated with later test performances) than first-take scores.

RESULTS
Score gains averaged about one standard deviation for all three steps — a larger increase than found in studies in other professions. Average gains for repeaters were much larger than expected due solely to measurement error (about one-fourth of the gain could be explained by regression toward the mean); in addition, repeat scores were as accurate as initial scores for predicting performance on future tests in the USMLE series.

WHY THIS MATTERS
The evidence suggests that scores from a second attempt have similar validity evidence as those from first attempts. This finding supports a policy that allows failing examinees opportunities to repeat. Future research should examine scores from third and fourth attempts. This work was presented at the annual meeting of the AAMC and will be submitted for publication.

CONTACT
Lucy Ling, lling@nbme.org
DO EDITORIAL UPDATES TO DRUG-RELATED TEST ITEMS AFFECT ITEM STATISTICS?

BACKGROUND
When changes are made to a test item, the item must be re-pretested to determine if the edit altered its statistical properties. The challenge is that because medications change continuously, drug-related items must be frequently updated to remain current. This means dedicating much time and effort to re-pretesting. This study compared 44 original multiple-choice items to 120 alternates, where the alternates had the drug name changed to another drug in the same class. Successors were compared to original items in terms of their difficulty, discrimination, and response time.

RESULTS
Item statistics are most affected when the change in drug name occurs in the item’s key (correct answer). However, changing the drug name in the stem of the item or in the distractors (incorrect answer) did not produce significantly different item statistics.

WHY THIS MATTERS
The results suggest that it may be necessary to re-pretest only those medication-related test items for which the correct answer is changed. This change in testing practice would improve efficiency by freeing up examination space to pretest new item content or experimental formats. This research will be presented at the American Educational Research Association (AERA) annual conference in 2018.

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JUST HOW RELIABLE ARE THOSE SUBSCORES?

BACKGROUND
Students and medical schools usually request detailed feedback (i.e., subscore profiles) about their test performance. However, studies indicate that subscores are not very reliable. The present study evaluated an index based on generalizability theory for quantifying the reliability of subscore profiles. The index, known as G, was introduced by Brennan (2001); to date it has been subject to little or no research.

RESULTS
Values of G for subscores based on real and simulated exams were low, typically ranging from the .30s to .70s. However, G was found to be more sensitive than existing methods for detecting instances when subscores are more reliable for some groups than for others (e.g., based on gender, ethnicity, years since graduation).

WHY THIS MATTERS
This study, to appear in Applied Psychological Measurement, supports previous research documenting that subscores for individuals are not very reliable. Results also indicate that G is more sensitive than traditional methods for detecting when subscores can be reliable for subgroups of examinees. Future research will evaluate the utility of G for gauging the reliability of aggregate subscore profiles reported to institutions.

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MEDICAL EDUCATION AND ASSESSMENT


MEASUREMENT, STATISTICS, AND GENERAL ASSESSMENT


Clauser A, Foelber K. An application of multivariate generalizability theory to examine composite score reliability. National Council on Measurement in Education Annual Meeting; April 2017; San Antonio, TX.


Clauser B. A history of test theory. Paper presented as part of the history of educational measurement in America: origins to 1950, a training session at: National Council on Measurement in Education Annual Meeting; April 2017; San Antonio, TX.


Chen T, Huang C, Liu C. An imputation approach to handling incomplete computerized tests. International Association for Computerized Adaptive Testing; August 2017; Niigata, Japan.

Feinberg R, Jurich D, Foster L. Examining the impact of accessing references on a maintenance of certification examination. American Educational Research Association Annual Meeting; April 2017; San Antonio, TX.


Huh N, Xie Q, Liu C, Huang, C. Detecting compromised items in CAT using a sequential monitoring procedure. Conference on Test Security; September 2017; Madison, WI.


Pak S, Qian H. Applying Rasch testlet models to CAT with varied testlet characteristics. National Council on Measurement in Education Annual Meeting; April 2017; San Antonio, TX.

Pohl S, von Davier M. Using response times to deal with missing responses due to time limits. Paper presented at: 82nd Annual Meeting of the Psychometric Society; July 2017; Zurich, Switzerland.


Ross, LP. Measurement issues in scoring, equating, and standard setting. Training session and focus group at: Association of American Medical Colleges Annual Meeting; November 2017; Boston, MA.

Rubright JD. Perspectives on graduate student internships. Northeastern Educational Research Association Annual Meeting; October 2017; Rocky Hill, CT.


Swygert K, Burke M, Grosso L. Validity in the context of certification examinations: challenges, successes, and more challenges. Panel/Roundtable at: Association of Test Publishers Annual Meeting; March 2017; Scottsdale, AZ.


von Davier M. Methodological advances in PISA scale linking. Symposium at: National Council on Measurement in Education Annual Meeting; April 2017; San Antonio, TX.

von Davier M. What is comparability and why is it important? Paper presented at: 82nd Annual Meeting of the Psychometric Society; July 2017; Zurich, Switzerland.

von Davier, M. Research around innovative domains in large scale survey assessments. Invited workshop at: National Taiwan Normal University; September 2017; Taipei, Taiwan.

von Davier M, Cho Y, Pan T. New results on ignorability of missing data due to stopping rules in ability testing. 5th Workshop on Statistical Issues in Psychometrics, Columbia University; November 2017; New York, NY.

von Davier M. Comparability of IRT scales in international assessment. Invited talk at: University of Maryland Educational Measurement and Statistics Department Lecture Series; November 2017; College Park, MD.

von Davier M. PISA linking and comparability in international assessments. Invited presentation at: South American Development Bank Workshop; March 2017; Washington, DC.

MEDICAL EDUCATION AND ASSESSMENT


Brittan D, Kushner R, McAllister K. Obesity medicine: building credibility and seeking certification in a stigmatized field. American Board of Medical Specialties Conference; September 2017; Chicago, IL.

Clauser A, Subhiyah R, Martin DF, Guernsey J. A fresh perspective: examination blueprint development. American Board of Medical Specialties Conference; September 2017; Chicago, IL.


Clauser B, Fromme B, Hicks PJ, Margolis MJ. A novel mobile milestones-based assessment system: development, implementation, and initial outcomes. Session presented at: Accreditation Council for Graduate Medical Education Annual Conference; March 2017; Orlando, FL.

Haist S. TEACH 201 course. Society of General Internal Medicine Annual Meeting; April 20, 2017; Washington, DC.

Haist S, Navarro A, Klapholz H. Joining forces to improve the gap in caring for the military-connected. Medicine X; April 2017; Palo Alto, CA.

Haist S, Lindsley J, Bracken-Vasquez C, Cowan T, Fulton T. Use of a reference metabolic map in assessment: updates from the NBME metabolic map task force and next steps. International Association of Medical Science Educators Annual Meeting; June 2017; Burlington, VT.


Hawley J, Gackstetter G, Raymond M, Case H, Mee J. Veterinary profession practice analysis. American Association of Veterinary State Boards Annual Meeting; September 2017; San Antonio, TX.


Indik JH, Duhigg LM, McDonald F, Lipner RS, Rubright JD, Haist SA, Botkin NF, Kuvin JT. ACC in-training examination predicts outcomes on the ABIM certification examination. Paper presented at: American College of Cardiology Annual Scientific Session; March 2017; Washington, DC.

Katsufakis PJ. NBME/USMLE update. Federation of State Medical Boards Annual Meeting; April 2017; Fort Worth, TX.

Katsufakis PJ. Crossing international borders/USMLE update. Association of Medical Councils of South Africa; August 2017; Cape Town, South Africa.
**Katsufrakis PJ.** Current metrics: what is measured now? Panel at: The National Academies of Sciences, Engineering and Medicine, Graduate Medical Education Outcomes and Metrics Workshop; October 2017; Washington, DC.

**Katsufrakis PJ.** NBME/USMLE update. Association of American Medical Colleges Annual Meeting; November 2017; Boston, MA.

**Katsufrakis PJ.** Keynote address. American Medical Association Interim Meeting of the House of Delegates; November 2017; Honolulu, HI.


**Morales A, Daniels C, Butler A.** Overview of MSS clinical exam development process. American Society of Echocardiography Conference; April 2017; San Diego, CA.


**Margolis M, Hicks PJ, Schwartz A, Clauser BE, Carraccio C, Bruegel M.** Development of a competency-based assessment system for physicians in training. Presented at: MedBiQuitous Annual Conference; June 2017; Baltimore, MD.


**Paniagua M.** Burnout and wellness: 100 days of rain essay reflection. Invited session at: National Academy of Medicine Global Forum; April 6, 2017; Washington, DC.


**Salt J.** NBME Step 1 and Step 2 updates. 2017 AAMC CGSA/COSR Regional Meeting; April 2017; Rochester, MN.


**GENERAL INTEREST**

**Arena H.** Reducing electric and gas consumption, cooling, and heating, in a conventional office building fitted out with a chilled beam system. Honeywell Users Group Conference; June 2017; Phoenix, AZ.

**Schmidt W.** Patterns from the future: exploration of advanced technology on user experience. STLUX Conference; September 2017; St. Louis, MO.