INNOVATION

SUMMIT 2019

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ABA

The American Board of Anesthesiology

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ABA THE AMERICAN BOARD OF ANESTHESIOLOGY

CHANGING THE PARADIGM

The American Board of Anesthesiology has taken the long view as it evolves its continuing certification program. Since 2011, the Board has stayed abreast of and attuned to how trends in technology and healthcare practice may be leveraged to improve the program and add value to diplomates' practice. Central to this effort has been the process of engaging our diplomates and experts in technology, medical education and learning science to more fully understand how to harness innovative approaches to create a more relevant, appealing and diplomate-centered program.

Our goal is to improve public health and enhance patient outcomes by ensuring that anesthesiologists are keeping their medical knowledge up to date. In doing so, we also assure the public that board-certified physicians are committed to providing high-quality care throughout their careers.
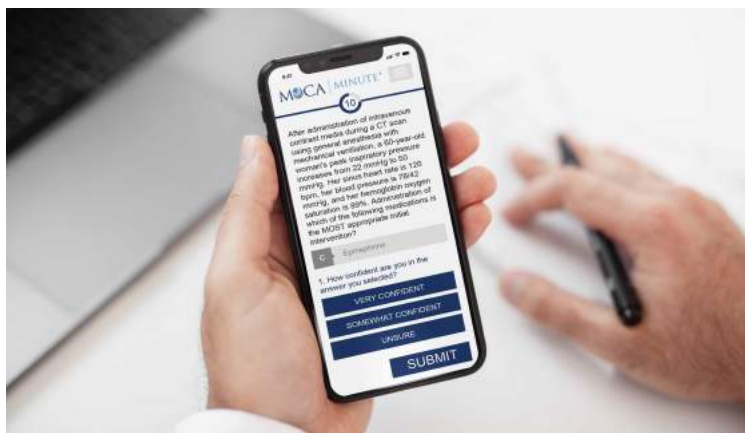
MOCA Minute on cell: MOCA Minute® is at the core of MOCA 2.0

We began reimagining our original Maintenance of Certification in Anesthesiology® program (MOCA®) eight years ago when our Board of Directors began crafting a vision for using technology to foster a culture of lifelong learning. We consulted with leaders in anesthesiology, education and technology to conceptualize the future program. Diplomates participated in surveys and focus groups, and a volunteer MOCA users' group, comprised of board-certified anesthesiologists across the career and subspecialty spectrum, contributed to the vision for the program's redesign. Building what would become MOCA 2.0® was a community effort.[1]

MOCA 2.0 launched in 2016 with MOCA Minute®, our longitudinal assessment, at its core. Our objective was to reduce the burden that some diplomates told us MOCA caused by integrating the program's components; MOCA Minute helped diplomates identify knowledge gaps, and linked them to related learning and activities they could complete to fill those gaps. With thousands of anesthesiologists participating in the program, we saw an opportunity to improve the performance of the entire diplomate corps.

Although it appeared that we were making progress, diplomates told us that we still had work to do.[2] We've remained committed to rigorously evaluating the program and evolving it to maintain its relevance to diplomates' practice and to promote lifelong learning.

As we begin visioning the next iteration of MOCA, we're relying on this same community engagement to help us strategically invest our time and resources on program concepts and components that add the greatest value to our diplomates' practice.

In this spirit, we convened an Innovation Summit in Palo Alto, Calif., in April 2019, bringing together experts in artificial intelligence (AI), machine learning, adult education and other innovative learning disciplines to inform our goals for the next generation of continuing certification. With this initiative, we endeavor to build on the diplomate-centered nature of MOCA 2.0 while incorporating adaptive and microlearning, and offering credit for physician participation in on-the-job learning. We're continuing to cultivate a lifelong learning community with enhanced customization and convenience.

At the Summit, we sought to learn from these experts as well as our physician colleagues how technical innovation could support learning, add value and enhance patient care.

LEARNING THROUGH INNOVATION

The Summit featured speakers who provided overviews of the changing technology landscape and its implications for life, medicine, business and education.[3] They described the cutting edge of adaptive and microlearning for educational initiatives and discussed innovations in medical education. They also provided visionary perspectives and practical experiences for using technology in anesthesiology education. The speakers interacted with approximately 50 invited guests who were representative of trainees, diplomates, ABMS and its member boards, CME and training organizations, and physician educators.

Donald Clark, CEO of Wildfire Learning, an artificial intelligence content creation company, opened the Summit with a stimulating discussion on how algorithms and AI are revolutionizing education. As an entrepreneur, teacher and researcher who has designed online learning for educational, vocational, corporate, and adult learning organizations, he noted that AI has the power to positively influence outcomes for millions of learners. Clark emphasized the importance of dialog-based applications for today's learners and the opportunities provided by AI for student engagement. He cited instances of chatbots responding to undergraduates' queries faster than teaching assistants, providing recommended content and feedback upon request.

Donald Clark video: Donald Clark on creating AI-rich content

AI, he said, has become so sophisticated that it can replicate human communication in ways that make it difficult to distinguish between a human and a machine. AI tools learn faster than people,

are capable of adopting language and voices, and can even coach and mentor. They will not replace humans, but can provide powerful tools that make learning more efficient and effective. Integration of AI into our continuing certification program might help diplomates learn something in a moment of need. For instance, AI processes could read a physician's upcoming case list in an electronic medical record system and push out learning resources that help him or her prepare for those cases. Such resources might include quickly generated summaries of relevant papers or clinical guidelines in written or spoken form (e.g., podcasts).

Advances in AI algorithms have led to adaptive learning in which computer-generated teaching resources can adjust in response to learner interaction, skipping ahead or slowing down based on their needs. Increasingly used in schools, such technology could also allow physicians to select their preferred learning path, or to have their most appropriate instructional path selected seamlessly for them. AI may facilitate the packaging of on-the-job learning so diplomates don't have to stop working to report what they are learning. These ideas align well with what our diplomates tell us we should do, which is to meet them where they are if we want them to meaningfully engage in a continuing certification program.

Clark espoused the premise that AI and natural language processing can help us move beyond multiple-choice questions to embrace a variety of assessment formats, including open-ended and short-answer questions, guided scenarios, and multi-modal evaluations potentially including evaluations in virtual reality. Real-time face recognition software offers the possibility of online proctoring.

Implementing newer technologies is not without its challenges, and the practical application of promising innovations means that, at this time, many remain aspirational. AI is messy, according to Clark. Large amounts of data must be analyzed and acted upon to make these tools work optimally. Learners often express interest in appealing AI-dependent products or programs, which they

will ultimately not actually use in practice. Consumers have rising expectations, are impatient, and have limited tolerance for deficiencies in capabilities and suboptimal performance of emerging technology. Furthermore, people often flock to flashy new tools that offer little educational value. Clark cautioned summit participants that real learning is often difficult and, despite advances in technology, requires considerable effort on the part of the learner. Nonetheless, he provided insight into real advances in AI and the inevitability of a continuing evolution of learning.

"Learning in academia and learning in the workplace are very different. In academia, the business is-learning … In the work-place, this is a new concept. You're learning to be relevant, to keep your job."

— Donna Murdoch, Ed.D.

Donna Murdoch, Ed.D., an adjunct assistant professor of Adult Learning and Leadership at Columbia University Teachers College, supports complex business transformations. She noted that there is a reluctance to change, whether that change be in industry practice, education methodology or an evolution in medical education and training. Organizations must be adaptable and agile to manage the rapidly changing environments we now operate in, while at the same time continuing their core business. Dr. Murdoch noted that success today is dependent upon an organization's ability to get individuals to integrate learning into their practice and to engage the learners on their terms. We need to become comfortable with the ambiguity that often accompanies change because with ambiguity comes opportunity.

Dr. Murdoch facilitated a fascinating discussion during which medical students and residents provided insight into the ways in which they learn, describing methodologies and resources that were unavailable to more senior summit participants when they were in training. Trainees were encouraged to be specific about what they wanted – recognizing that learners are poor at recognizing what they need – and leaders in training were exhorted to carefully consider how expectations for successful completion of training and the methods of assessment drive learning. Participants noted that processes that identify knowledge deficits – especially those deficits that the learner was previously unaware of – are especially useful.

Rishi Desai, M.D., Chief Medical Officer of Osmosis and a pediatric infectious disease specialist provided perspective on demographic, environmental and technologic changes. Dr. Desai highlighted the evolution of attitudes to knowledge acquisition from "I know it" to "I'll look it up". He described how today's medical students learn, noting that fewer than 25 percent of them attend class. Classroom lectures are just one of many medical education sources and students do not necessarily perceive them as more important than other resources. Online access to recorded classroom lectures allows them to view lectures – often at increased playback rates – at their convenience to ensure that they haven't missed anything. Instead, of classroom lectures, today's medical students rely on multiple innovative companies that offer medical education resources [e.g. Sketchy, Pathoma, Firecracker, Osmosis (which produces open-education learning resources for medical students and clinicians)] to learn what they need to know.

Today's medical students and resident physicians select their learning tools in a dynamic landscape where the number of options – some of which are of dubious quality – is ever increasing. Even small innovations can help a company stand out.

LEARNING THROUGH INNOVATION

The next generation of diplomates and many current ones want the autonomy to choose their learning. Dr. Desai noted that the onus is on the certifying boards to deliver what physicians need – which may or may not be what they think they need – if they truly want to add value to the physicians' medical practice while fulfilling the Boards' obligation to the public. Rishi also pointed to the likely increase in the use of virtual reality to capture real-time performance data that they can use to improve.

Rishi Desai, M.D., on video-based assessment and virtual reality for learning

Larry Chu, M.D., a professor of anesthesiology, perioperative and pain medicine at Stanford University School of Medicine and the director of the Stanford Anesthesia Informatics and Media (AIM) Lab, explained that innovation requires a culture of curiosity and psychological safety. The ABA, he said, needs to be curious about its diplomates, their needs, challenges and professional goals. Based on data acquired through his innovative programs, he described today's anesthesiology residents as computer-knowledgeable, mobile, millennial learners, who want access to learning resources 24 hours per day. Dr. Chu described typical diplomates, highlighting evolving diplomate needs as they progress through their career and challenging the ABA to engage with disparate anesthesiologist circumstances.

He believes that diplomate engagement leads to co-creation, which adds value to both the diplomate and the Board. It also provides a path to innovation that is born out of the need to solve a problem or address a need.

Psychological safety allows physicians to fail, identifying a problem, without consequences. Carla M. Pugh, M.D. Ph.D., FACS, and her team with the Quantified MD Project provide a safe space for physician learning. Dr. Pugh, a professor of surgery at Stanford School of Medicine and director of the Technology Enabled Clinical Improvement Center, said during the Summit that physicians want to be tested to understand their abilities to identify areas in which they can improve. For the past 15 years, she and her team have used sensor technologies combined with simulation to capture data on procedural skills performance. The team has amassed a database of more than 17,000 simulation-based assessments with the goal of quantifying mastery.

They used an intubation simulator at the American Society of Anesthesiologists annual meeting to measure anesthesiologists' ability to accurately and efficiently intubate patients. Despite being asked to publicly display their skills, hundreds of anesthesiologists lined up to participate in this simulation and were anxious to know how they performed. This research can help us understand what mastery looks like in practice and demonstrated the appetite of clinicians for feedback about their procedural skills.

Dr. Chu noted that the success of efforts such as

Larry Chu, M.D., presentation - Anesthesiology Learning Design: Evolving & Adapting to Meet the Needs of Today's Learners

Dr. Pugh's depends heavily on physicians feeling safe enough to engage in the learning that comes out of these experiences. They must feel like they can display knowledge gaps in the continuing certification process without concern that their certification is at stake.
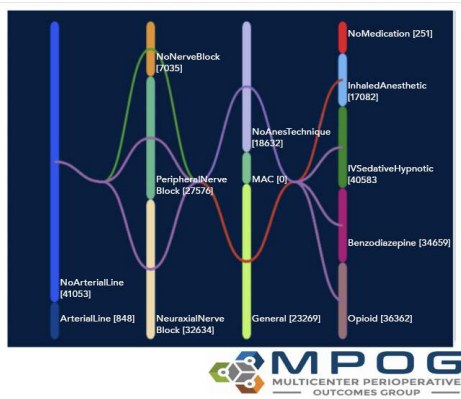
Is the goal of continuing certification to identify the failing few or to lift the masses who are performing well and want to get even better?

Participants raised this philosophical question during the Summit. As a certifying board, the ABA serves to advance excellence in anesthesiology practice, to champion quality standards and guide lifelong learning. While MOCA may identify poor performers, the objective is to make every anesthesiologist better. If physicians get better, improved patient care should follow. The challenge is identifying and agreeing upon the best approach to improving care through continuing certification. There is a tension between formative and summative approaches.

According to Nirav Shah, M.D., registries play an important role in helping physicians get better by enabling practice-based learning. Dr. Shah,

Nirav Shah, M.D., presentation - Using Registry Data for MOCA®

an assistant professor of anesthesiology at the University of Michigan and a program director for Anesthesiology Performance Improvement and Reporting Exchange (ASPIRE), shared an overview of his work during the Summit.

ASPIRE is the quality improvement arm of the Multicenter Perioperative Outcomes Group (MPOG), a perioperative patient registry whose members include clinicians, quality improvement experts, software developers, researchers, statisticians and administrators from more than 50 hospitals in 18 states and two countries.

There is concern that widely used medical education techniques have little effect on physician behavior and performance, but Dr. Shah opined that, in contrast, feedback from registry data can significantly affect individual practitioners. By comparing personal practice data against aggregate data from 10 million cases, and sending monthly feedback emails to approximately 3,500 anesthesiologists, ASPIRE (and similar registries) can help anesthesiologists enhance their individual practice and thus improve patient safety and outcomes. Board-certified anesthesiologists can earn MOCA credit for reviewing their feedback emails and failed case information monthly for 12 months. In the future, Dr. Shah said the goal is to make MPOG a tool physicians can use to make "day of" decisions related to surgeries by reviewing the performance and outcomes of others who managed similar cases.

"I want to encourage everyone to think about innovation as a marathon. It's not a sprint. What we're doing here is important work. This is part of a culture that (the ABA) is creating."
— Larry Chu, M.D.

WHAT'S NEXT FOR CONTINUING CERTIFICATION

During the Summit, Richard Hawkins, M.D., CEO of the American Board of Medical Specialties (ABMS), summarized the outcomes of the Continuing Board Certification: Vision for the Future Commission. ABMS established the independent Commission in 2018 to assess the MOC program and make recommendations for a future program model. The Commission, which was comprised of physicians and healthcare leaders, issued its final report in February 2019 with 14 recommendations for reimagining continuing certification.[4] Dr. Hawkins offered the report as a roadmap that will guide the future direction of ABMS and its Member Boards, including the ABA.

*The final Vision Commission report issued in February 2019*

Among the report's recommendations is a call to develop new continuing certification program standards that offer greater flexibility and promote consistency among the Member Boards. It also recommends integrating the program's components and providing practical feedback to diplomates to help them improve their practice. One avenue to accomplish this, according to the report, is through longitudinal assessment, which can offer physicians real-time feedback on their current knowledge and skills. The Vision Commission report suggests incorporating longitudinal and other innovative formative assessment strategies, like MOCA Minute, into continuing certification programs.

The report also calls for working with societies, CME providers and others in the healthcare community to inform the development of future learning resources. The ABA recently convened a CME Provider Advisory Task Force to advise our Board in the design of a dashboard through which we could provide aggregate MOCA Minute performance data to guide future continuing medical education development. The report also recommended that ABMS address challenges related to the practice improvement and professionalism components of the program, and communicate regularly with diplomates about standards for the specialty, encouraging feedback.

The summit discussions generated helpful feedback for our Board of Directors and our continuing certification Users' Group, which is comprised of 17 volunteer anesthesiologists and two Board directors who are helping to guide the program's future direction. Our Users' Group affirmed much of what we heard at the Summit. Continuing certification should reflect modern learning approaches, including podcasts, augmented reality, virtual simulation and MOCA Minute powered by AI. Anesthesiologists want their learning resources to be diverse and varied in length, media and purpose. "Forced learning" is unpleasant and unproductive, according to the Users' Group. Learning that is immediately applicable to a current case or supports a physician's professional development goals is ideal.

Building upon the Summit and Users' Group feedback, the Board of Directors convened a learning theory workshop in July in Raleigh, N.C., to discuss the broader purpose of continuing
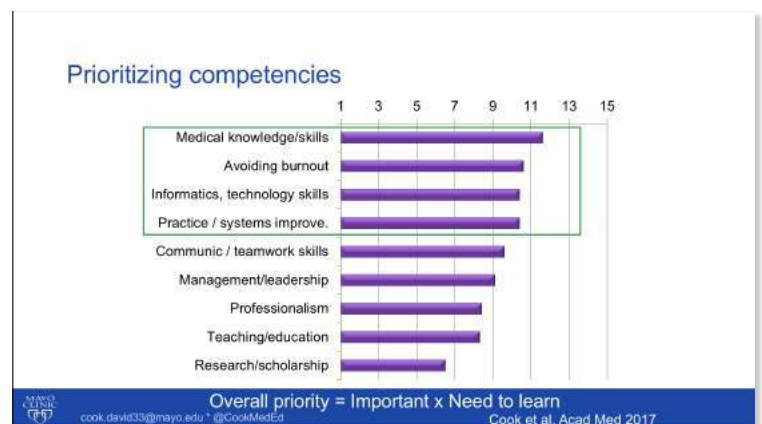
David A. Cook, M.D., M.H.P.E., presentation – Learning Theory Workshop

certification and established guiding principles for implementing some of the innovations discussed during the Summit. We affirmed that our goal is not simply to "test" diplomates, but to facilitate learning throughout the diplomate's career to enhance patient care and improve public health. We discussed core competencies we want to assess and improve upon, modalities that could facilitate this work, and methods by which we can prioritize the various learning modalities as we evolve our program. Challenges include how best to use assessment to promote higher-order competencies such as team leadership and communication, and how continuing certification can promote an interactive learning community of anesthesiologists.

Our community of anesthesiologists, steered by our volunteer Users' Group, will continue to evolve continuing certification in anesthesiology. In 2020, we will launch a redesigned Physician's Portal and a new ABA mobile application, which will provide the technical infrastructure we need for the future evolution of the program. We expect future development to rely heavily on technologies that allow us to meet diplomates where they are professionally, allowing them to chart their course toward personalized learning that positively impacts patient outcomes. We understand that we must balance working expeditiously to satisfy the diplomates' desires for the most relevant program with working judiciously to ensure that continuing certification meaningfully contributes to helping physicians provide the best possible patient care.

A Users' Group of volunteer anesthesiologists is guiding the evolution of our continuing certification program

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INNOVATION SUMMIT SPEAKERS

Lawrence Chu, M.D., M.S.
Professor, Anesthesiology, Perioperative and Pain Medicine

Larry Chu, M.D., is a Professor of Anesthesiology, Perioperative and Pain Medicine and Director of the Stanford Anesthesia Informatics and Media (AIM) Lab. Dr. Chu founded the START online educational program as well as the Learnly online learning ecosystem for post-graduate anesthesiology education. The Stanford AIM Lab is one of the leading anesthesiology education innovation labs working at the intersection of anesthesia education and emerging technology. He is an NIH-funded clinical researcher and is Executive Director of Stanford Medicine X, the world's most-discussed academic program on emerging technology and medicine. He also directs Medicine X | ED, a conference exploring the future of patient-centered medical education. He has written eight books, over 50 papers and over 50 book chapters in academic anesthesiology. He is a member of the editorial advisory board for The BMJ, one of the most influential general medical journals in the world.

Donald Clark
Chief Executive Officer

Donald Clark is an EdTech Entrepreneur, CEO, Professor, Researcher, Blogger and Speaker. He was CEO and one of the original founders of Epic Group plc, which established itself as the leading company in the UK online learning market, floated on the Stock Market in 1996 and sold in 2005. As well as being the CEO of Wildfire an AI-driven learning company, he also invests in, and advises, EdTech companies.

Donald has over 30 years experience in online learning, games, simulations, semantic, adaptive, chatbot, social media, mobile learning, virtual reality and AI projects. He has designed, delivered and advised on online learning for many global, public and private organizations. He is an evangelist for the use of technology in learning and has won many awards, including the first 'Outstanding Achievement in E-learning Award' and 'Best AIM Stock Market Company', 'Most Innovative Online Product' (for WildFire), 'Best Online Learning Project (for WildFire)' and 'JISC EdTech Award' (for WildFire). An award winning speaker at national and international conferences, he has delivered keynotes in Europe. US, Africa, Australia, Middle and Far East. Also a regular blogger (10 years+) on learning technology, his series on learning theorists, as well as 500 researched, online design tips, are valuable open resources. His book on AI for learning is in production.

Rishi Desai, M.D., M.P.H.
Chief Medical Officer

Rishi Desai M.D., M.P.H. is a pediatric infectious disease physician with a public health background who currently serves as the Chief Medical Officer at Osmosis and recently led Khan Academy Medicine. Osmosis generates open-education videos and questions that are available in multiple languages and serves as a personalized learning engine for 400,000+ medical students and clinicians around the world.

Dr. Desai had an accelerated education, completing high school and receiving his BS in Microbiology and Molecular Genetics from UCLA by the age of 18. He completed his medical training at UCSF and went on to work at medical centers including Boston Children's Hospital, Boston Medical Center, Children's Hospital Los Angeles, and Stanford University. He earned his MPH in epidemiology at UCLA, and then spent two years at the Centers for Disease Control and Prevention as an Epidemic Intelligence Service Officer investigating disease outbreaks, before beginning his work in online medical education.

When he's not at the park with his 2-year-old son, he's eating raspberries and learning Mandarin.

Donna Murdoch, Ed.D.
Adjunct Assistant Professor

Donna Murdoch, Ed.D. is a global learning leader with 20+ years of experience driving innovative programs that support complex business transformation, change, and capacity building programs with impact. In the workplace and in academia, Donna leads the design, development, and execution of best in class strategies that develop a culture of continuous learning, always with a "people first" focus. Donna is a Professor of Adult Learning and Leadership at Columbia University Teachers College, and a Wharton Global Talent Management Fellow. She has worked with organizations such as Philips, S & P Global, UNICEF, the UN, Apollo Group, and others to shape Learning Strategy around new and emerging technology.

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