

Update

Spring 2017

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AUA Comments on Travel Ban



Jeanine P. Wiener-Kronish, MD
 President, AUA
 Harvard University

Included in this issue of AUA Update is a letter written by the AAMC to President Trump. As you can see, every major medical association and specialty signed this letter, including the American Medical Association, as well as the Association of University Anesthesiologists and the Society of Academic Anesthesia Associations.

The Association of University Anesthesiologists affiliated with the International Anesthesia Research Society to increase our ability to network, collaborate and learn about optimal care for our patients. We are part of the AAMC to learn about teaching our young trainees and to share best practices. All of these goals and our mission statement suggested we needed to align with the AAMC in expressing our concern for the restriction of certain foreign nationals and refugees. To quote the AAMC “we are dedicated to promoting a diverse and culturally competent health and biomedical workforce”. Thank you all.

February 1, 2017
 President Donald J. Trump
 The White House
 1600 Pennsylvania Avenue, NW
 Washington, DC 20500

Dear President Trump:

The undersigned organizations are deeply concerned that the January 27 executive order restricting the admission of certain foreign nationals and refugees to the United States will disrupt patient care, health education, and medical research. Our organizations are dedicated to promoting a diverse and culturally competent health and biomedical workforce—at home

and abroad—that supports improvements in health care, access to providers, breakthroughs in medical research, and equitable health for all patients regardless of their backgrounds. We urge the administration to provide additional guidance and to reconsider aspects of the executive order to avoid unnecessarily undermining our ability to fulfill these shared missions.

Among its challenges, the United States currently faces a number of health care workforce shortages. Highly skilled health professionals from other countries, many in roles that otherwise could not be filled, represent a significant portion of providers who care for American and international patients within our borders, meeting an important need in our nation’s health care system.

We recognize the importance of ensuring national security, but current entry and renewal pathways for foreign nationals—including student, temporary visitor, extraordinary ability, and employment visas—provide a balanced approach that attracts the best and brightest from around the world and advances U.S. interests through educational and cultural exchange. Impeding these pathways jeopardizes critical access to health care for our nation’s most vulnerable populations, including those in rural and urban underserved communities across the country, and individuals who come to the United States to receive specialized care not available elsewhere.

Our ability to attract top talent from around the world also enriches the research laboratories at American institutions that are working toward cures, and it has helped position the U.S. as a global leader in medical research, strengthening our economy and bolstering the public’s health. Because disease knows no geographic boundaries, it is essential that we continue to foster, rather than impede, scientific cooperation with clinicians and researchers of all nationalities as we strive to keep our country safe from all threats.

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AUA Comments on Travel Ban

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In light of these concerns, we urge the administration to consider the potential impact of the executive order on the health of the nation that will result from turning away patients, health professionals, and researchers. As a community, we offer our assistance in developing measured immigration policies that reflect the health care needs of the nation.

Sincerely,

Academy for Radiology & Biomedical Imaging Research
AcademyHealth
Accreditation Council for Graduate Medical Education and
ACGME International
Alliance for Academic Internal Medicine
American Academy of Family Physicians
American Academy of Neurology
American Academy of Pediatrics
American Association of Colleges of Nursing
American Association of Colleges of Osteopathic Medicine
American Association of Colleges of Pharmacy
American Association of Colleges of Podiatric Medicine
American Board of Internal Medicine
American College of Physicians
American Congress of Obstetricians and Gynecologists
American Dental Education Association
American Gastroenterological Association
American Medical Association
American Osteopathic Association
American Pain Society
American Psychiatric Association
American Psychoanalytic Association
American Psychological Association
American Public Health Association
American Society for Clinical Pathology
American Society for Histocompatibility and Immunogenetics
American Society of Hematology
American Society of Nephrology
American Society of Neuroradiology
American Society of Transplant Surgeons

American Society of Transplantation
America's Essential Hospitals
Association for Academic Psychiatry
Association for Molecular Pathology
Association of Academic Anesthesia Chairs
Association of American Medical Colleges
Association of Anesthesiology Core Program Directors
Association of Anesthesiology Program Administrators and
Educators
Association of Anesthesiology Subspecialty Program Directors
Association of Pathology Chairs
Association of Population Centers
Association of Schools and Colleges of Optometry
Association of Schools and Programs of Public Health
Association of Schools of Allied Health Professions
Association of University Anesthesiologists
Association of University Programs in Health Administration
Child Neurology Society
College of American Pathologists
Council on Social Work Education
Educational Commission for Foreign Medical Graduates
Emergency Medicine Residents' Association
Endocrine Society
Federation of American Societies for Experimental Biology
Heart Failure Society of America
HIV Medicine Association
Infectious Diseases Society of America
North American Society of Cardiovascular Imaging
Physician Assistant Education Association
Population Association of America
Renal Physicians Association
Society for Maternal-Fetal Medicine
Society for Vascular Surgery
Society of Academic Anesthesiology Associations
Society of Computed Body Tomography & Magnetic Resonance
Society of General Internal Medicine
Society of Gynecologic Oncology
Society of Nuclear Medicine and Molecular

SAVE THE DATE! May 4-5, 2017

AUA 64TH ANNUAL MEETING

Grand Hyatt Washington • Washington, DC

Co-Hosted by Johns Hopkins Medicine and University of Maryland School of Medicine



AUA

Association of University Anesthesiologists

For more information, visit www.auahq.org.

New AUA Newsletter Editor: Lisa Wise-Faberowski



*W. Andrew Kofke, MD, MBA, FCCM
University of Pennsylvania
Philadelphia, Pennsylvania*



*Lisa Wise-Faberowski, MD
Assistant Professor of Pediatric Cardiac
Anesthesia and Research
Stanford University*

After 15 years as newsletter editor and, more recently, chair of the Communications and Website committee, Andrew Kofke has stepped aside from this position and President Wiener-Kronish has appointed Lisa Wise-Faberowski from Stanford to assume this position ... a five year term and with it she becomes a new member of AUA council. Dr Wise-Faberowski has been a contributor to the Communications and Website committee for many years with her contributions noted for their depth and creativity.

The newsletter editor position arose from a committee chaired by Jerry Reves around 2001. Up until that time newsletters were variable with inconsistent content and formatting. Kofke assumed the position with the first newsletter under his guidance published Summer 2002 with a regular quarterly publication ever since. A wide variety of topics have been discussed with each issue consistently having educational and scientific content. Also included has been news, biosketches, book reviews, political updates, meeting summaries, technical tips, opinion, and humor. Some of Dr. Kofke's favorite and memorable articles in the Newsletter are listed below:

AUA Update Now Has an Editor.	www.auahq.org/Summer_AUA_PDF.pdf
A Giant Falls: EM Papper.	www.auahq.org/AUAWinter.pdf
Interview With Peter Safar.	www.auahq.org/AUAWinter.pdf
50th Anniversary Issue	www.auahq.org/Spring03_singlepage.pdf
Papper's thoughts on AUA.	www.auahq.org/Spring03_singlepage.pdf
Retaining our Best and Brightest	www.auahq.org/Spring03_singlepage.pdf
Interview With John Severinghaus.	www.auahq.org/fall03aua.pdf
I'm Unhappy Should I Send My CV?	www.auahq.org/fall03aua.pdf
You've Sent Me Your CV?	www.auahq.org/fall03aua.pdf
Patient Safety: Time for Leadership	www.auahq.org/Spring04.pdf
Focus on Robert Epstein	www.auahq.org/Winter04.pdf
Simulation: Miami, Oregon, UNM	www.auahq.org/Spring05.pdf
Why Invent New Medical Devices?	www.auahq.org/Summer2005.pdf
Anesthesia Dept's Respond to Katrina	www.auahq.org/Winter05.pdf
Plan to Improve Research in Anesthesiology.	www.auahq.org/Spring06.pdf

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New AUA Newsletter Editor: Lisa Wise-Faberowski

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Anesthesiologist Assistants in USA	www.auahq.org/Fall2006.pdf
Reves Rovenstine Lecture on Research	www.auahq.org/Winter2006.pdf
Interview With William Hamilton	www.auahq.org/Spring2007.pdf
Csete Presents Stem Cells to Ga Legislature	www.auahq.org/Fall2007.pdf
Enduring Contributions of Henry Beecher	auahq.org/Winter2007.pdf
Academy of Research Mentors	auahq.org/Spring08.pdf
Update on Katrina Recovery	auahq.org/Fall2008.pdf
Anesthesia Research Brookhaven Labs	auahq.org/Fall2008.pdf
Pronovost Wins Genius Grant	auahq.org/Winter2008.pdf
AUA strategic Plan	auahq.org/AUAWinter2009.pdf
Communications and Website Committee	auahq.org/AUAWinter2009.pdf
AUA Members Provide Support in Haiti	auahq.org/AUASpring2010.pdf
Tremper Rovenstine: Outcomes Research	auahq.org/AUAWinter2010.pdf
Kapur Rovenstine: Leadership	auahq.org/AUAWinter2011.pdf
Apfelbaum Rovenstine and ASA DSA	auahq.org/AUAWinter2012.pdf
Hornbein: The Doc Who Climbed Everest	auahq.org/AUASpring2013.pdf
AUA IARS Alignment	auahq.org/newsletter-8-7-13.pdf
AUA Member Runs for Congress	auahq.org/14_AUA_winter_newsletter_FFF.pdf
Global Engagement	auahq.org/15_AUA_winter_newsletter_F.pdf
Academic Home for Developing Scholars	auahq.org/15_AUA_spring_newsletter.pdf
Update AUA Scholars	auahq.org/15_AUA_summer_newsletter.pdf
Eisenach Innovative Rovenstine : Art & Science	auahq.org/15-AUA-winter-newsletter.pdf

Along with the ongoing work on the newsletter, websites with improving technology came upon us. Some effort has gone into improving the AUA web page. It could be further improved but AUA will need to impart resources so it's a judgement of sorts.

Also on the agenda is use of social media. AUA has traditionally been comprised of older more set-in-ways (curmudgeons) members and most suggestions that AUA have a presence on facebook, twitter, linked in, snapchat, line ...

you name it ... have met with a fair amount of indifference. Dr. Kofke predicts with the addition of AUA Scholars and the simple march of time that this will be changing.

There are several other items on the to-do list of the Website and Communications Committee. Dr. Kofke invites all members to consider this committee for service to AUA. Dr. Kofke has found his participation to have provided significant networking opportunities and it has been an enriching and creative pursuit.

Scientific Advisory Board Report

Can Acupuncture Be Integrated into Pain Management to Reduce Opioid Use?



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Opioid therapy has been increasingly used to treat chronic pain conditions. However, its long-term use is complicated by side effects, tolerance, hyperalgesia, dependence and abuse. The increasing number of deaths related to prescription opioid overdose has led the field to search for alternative medications or treatments in order to reduce opioid use. Based on a 2016 National Health Statistic Report, 41.6% of adults with musculoskeletal pain used one or more complementary health approaches,¹ and back pain is the most common medical condition treated with complementary and integrative medicine.^{2,3} In addition, about 38% of adults and 12% of children in the United States alone use healthcare modalities that are not considered as conventional medicine or modalities of health maintenance.²

Although originated from traditional Chinese medicine, acupuncture is one of the most commonly practiced modality of integrative medicine and is now used in nearly 100 countries⁴. Acupuncture is also well studied through both preclinical and clinical research with regard to its mechanism, effectiveness and feasibility. The current data appear to support some effectiveness of acupuncture in the management of acute postoperative pain and a variety of chronic pain conditions.

Postoperative pain

Accumulating evidence suggests that a variety of acupuncture treatments (e.g., acupuncture, electro-acupuncture, auricular acupuncture) are effective in improving postoperative pain and reducing opioid consumption. In a pragmatic study on postoperative pain management including 2,500 total hip and total knee replacement patients, adding acupuncture into an opioid regimen (72% of 2,500 cases) for postoperative pain management did not increase cost but resulted in an average short-term pain reduction by 1.91 points (95% CI: 1.83, 1.99), a 45% reduction of baseline pain score⁵. Several randomized studies also support the notion that acupuncture may be a useful adjunct for acute pain management. In a randomized controlled study (n = 100) with 4 different groups (control, sham,

low frequency or high frequency electro-acupuncture), the acupuncture effects on postoperative pain, opioid sparing, and opioid-related side effects were examined. The results showed that high frequency electro-acupuncture delayed the onset of analgesic request. During the first 24 hours postoperatively, the total amount of morphine consumption was decreased by 61% in the high frequency electro-acupuncture group. The incidence of nausea and dizziness during this period was also significantly reduced in both electro-acupuncture groups as compared with the control and sham group.⁶ Similar results have been demonstrated in another randomized controlled study in which 90 patients were assigned to receive placebo or real electro-acupuncture either before or after general anesthesia. During the 6-12 hours postoperatively, morphine consumption was significantly reduced in patients who received real electro-acupuncture before general anesthesia.⁷ Two additional studies (N = 54, N = 120) using auricular acupuncture treatment also showed that patients used less piritramide or ibuprofen after total hip arthroplasty surgery.^{8,9}

Transcutaneous electrical nerve stimulation (TENS) applied to acupuncture points is regarded as an effective treatment for various types of pain. A clinical study (N = 68) including a sham control group showed that fentanyl consumption was lower in the TENS/acupuncture group than sham controls in geriatric patients at both 24 and 48 hours after total hip arthroplasty surgery. Incidences of opioid-related side effects were also lower in the TENS/acupuncture group.¹⁰ Moreover, pain severity, number of patients required opioid, and mean opioid dose were significantly lower in the acupuncture group than controls in a study of 30 patients with post-nephrectomy pain.¹¹ Similar outcomes have been seen in patients with cardiac or thoracic surgeries in which several small prospective, randomized and controlled studies (n = 27-32) have shown that opioid consumption was less in patients treated with acupuncture.^{12,13}

While more randomized controlled studies with larger sample sizes are required to guide acupuncture practice, the current data indicate that acupuncture could be used as a tool to reduce opioid use in postoperative pain management.

Chronic pain

It is estimated that, in the United States alone, there are 25.3 million adults with daily chronic pain and 23.4 million adults experience a significant level of pain.¹⁴ Chronic low back pain and neck pain are common pain conditions associated with high medical cost and loss of productivity. While conventional treatments may have a limited benefit in improving outcomes for some patients, acupuncture has been used as an option to manage chronic low back and neck pain.

In a randomized, multicenter study involving 1,162 patients with low back pain, acupuncture therapy improved pain for at least six months, and both real and sham acupuncture were

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significantly better than conventional therapy.¹⁵ In another large-scale clinical trial, 3,093 patients with low back pain were randomly assigned to acupuncture or conventional medical care. Back function, pain, and quality of life were improved at 3 and 6 months in the acupuncture group.¹⁶ A randomized controlled multicenter trial examined the effectiveness of acupuncture combined with routine care (1,880 subjects), as compared to routine care alone (1,886 subjects), in patients with chronic neck pain. The results also showed a significant improvement in neck pain and disability in the acupuncture plus routine care group.¹⁷ As listed in Table 1, a number of other pain conditions have been treated with acupuncture based on the WHO recommendation.¹⁸

Table 1: WHO Recommendation on Acupuncture Treatment for Clinical Pain Conditions

Diseases, symptoms or conditions for which acupuncture has been shown to be effective	Diseases, symptoms or conditions for which the therapeutic effect of acupuncture remains to be determined
Low back pain	Radicular and pseudo radicular syndrome
Knee pain	Abdominal pain
Headache	Cancer pain
Neck pain	Fibromyalgia and fasciitis
Dental pain	Earache
Facial pain	Eye pain due to sub-conjunctiva injection
Postoperative pain	Labor pain
Rheumatoid arthritis	Pain due to thrombotic angiitis obliterans
Periarthritis of shoulder	Pain due to endoscopic examination
Renal colic	Chronic prostatitis
Tennis elbow	Stiff neck
Sciatica	Acute spine pain
Sprain	Reflex sympathetic dystrophy
Cranio-mandibular dysfunction	Temporomandibular dysfunction
	Pruritus

A major reason for patients to seek acupuncture treatment is a lower incidence of adverse effects than many drugs and medical procedures^{19, 20}. Nonetheless, regulations have been in place to ensure the safety of acupuncture. For example, acupuncture needles are subject to the same standard as medical needles, syringes and surgical scalpels by FDA in 1996²¹. In 1997, National Institutes of Health (NIH) recognized that acupuncture is extensively practiced by physicians, dentists, non-MD acupuncturists, and other practitioners in a Consensus Development Conference on Acupuncture.¹⁹

In spite of the positive development with regard to acupuncture as a tool in pain management, there are a number

of challenges in clinical research of acupuncture therapy. (1) The scientific merits of acupuncture studies are, from time to time, limited by study design and non-standardized acupuncture practices. (2) There are difficulties in maintaining true blindness to patients in clinical studies. (3) Sham needling often elicits responses similar to real acupuncture treatment, making it difficult to interpret study outcomes. (4) Acupuncture treatment is highly individualized, varying from day to day and one practitioner to another. As such, it is rather difficult to compare treatment outcomes among clinical studies when a given clinical condition is treated with different parameters such as acupuncture points, needling techniques, electrical versus manual acupuncture, duration of acupuncture in a single session, and between-session intervals.

In summary, an increasing number of physicians have integrated acupuncture and other complementary medicine modalities into their practices. Preliminary data from a small number of studies also indicate that integrating acupuncture into postoperative pain management may reduce opioid use. Although the clinical effectiveness of acupuncture therapy can vary due to differences in individual response as well as acupuncturists' training and experience, acupuncture could play a growing and effective role in acute and chronic pain management as an opioid-sparing tool. With the advancement in research and improvement in insurance coverage, it is anticipated that more patients will have access to acupuncture and other complementary medicine modalities as options of pain management.

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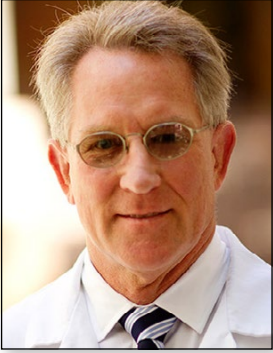
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New Chairs

Information provided by Society of Academic Anesthesiology Associations

Full Name	Institution
John Allyn, MD	Maine Medical Center
Richard L. Applegate II, MD	University of California (Davis) Health System
Sana Ata, MD	Lahey Clinic Program
Ansgar Brambrink, MD, PhD	New York Presbyterian Hospital (Columbia Campus)
Andrew Friedrich, MD	University of Cincinnati Medical Center
William R. Furman, MD, MMHC	Dartmouth-Hitchcock Medical Center
Robert R. Gaiser, MD	University of Kentucky College of Medicine
Gary R. Haynes, MD, PhD	Tulane University
Charles W. Hogue, MD	McGaw Medical Center of Northwestern University
Vesna Jevtovic-Todorovic, MD, PhD, MBA	University of Colorado
Robert Johnstone, MD	West Virginia University
Joseph Kim, MD	Allegheny Health Network
Geza Kiss, MD	Rutgers Robert Wood Johnson Medical School
Mark J. Lenart, MD, MPH	Naval Medical Center (Portsmouth)
Cynthia A. Lien, MD	Medical College of Wisconsin Affiliated Hospitals
Mazen A. Maktabi, MBBCh	University of Vermont Medical Center
Carlos B. Mantilla, MD, PhD	Mayo Clinic College of Medicine (Rochester)
David Ninan, DO	Riverside University Health System
Wolf Stapelfeldt, MD	St. Louis University School of Medicine
Scott Wallace	Naval Medical Center (San Diego)
Charles Youngblood, MD, MBA, MFA	Creighton University School of Medicine

An Update on Simulation for Academic Anesthesiologists



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Professor, Department of Anesthesiology
and Perioperative Medicine, David Geffen
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*Armando Ariza, MD, Chief, Veterans
Affairs Hospital, New Orleans,
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*Adam I. Levine, MD, Professor of
Anesthesiology, Perioperative and
Pain Medicine, Otolaryngology, and
Pharmacological Sciences, Mount Sinai
Health System*

The American Society of Anesthesiologists (ASA) Committee on Simulation Education was initially constituted in 2006 to foster high quality simulation-based training. In order to accomplish its goal, the committee developed a process for endorsing simulation programs, and to date, the ASA has endorsed a total of 49 programs throughout the nation. This network of programs is known as the ASA Simulation Education Network.

In 2010, the American Board of Anesthesiology (ABA) introduced simulation as a requirement within Part 4 of Maintenance of Certification in Anesthesiology (MOCA®). With the advent of MOCA 2.0, simulation became a Part 4 option rather than a requirement; participation is strongly encouraged through weighted credit. To date, over 8,000 participants have attended simulation courses for Part 4 credit. The simulation activity consists of a one-day interactive course designed to

identify and address practice gaps through the creation and implementation of performance improvement plans.

The ASA Committee, which became an Editorial Board in 2012, sets educational expectations for simulation courses that satisfy MOCA Part 4. An important aspect of these requirements is designed to ensure relevance to every anesthesiologist, including those who practice in subspecialty domains. Core events that are encountered in every course include hemodynamic derangements, hypoxemia and teamwork skills. The course, along with participant evaluations, are more fully described elsewhere.¹ On post-course follow-up the vast majority (94%) of participants successfully implemented some or all of their planned improvements.² Improvements focused predominantly on three areas: system-based changes, teamwork skills and personal knowledge. Of interest, many anesthesiologists' plans targeted others; 78% targeted other anesthesia providers or interprofessional colleagues, and targeting others was associated with an increased likelihood of plan implementation.

The Agency for Healthcare Research and Quality funded a group of ASA-endorsed programs to evaluate performance gaps among a population of anesthesiologists. The primary results of these investigations have been submitted for publication. Early findings, which included insights on implementing standardized scenarios across a network of simulation programs, have already been published.³

In 2016 ASA partnered with CAE Healthcare to develop SimSTAT, a computer-based 3D virtual environment that provides learners the opportunity to have immediate access to simulation-based education. The initial 5 modules will be released in 2017 and learners will be able to explore an interactive OR, PACU and Labor and Delivery suite in the comfort of their own home, while managing patients that are fully responsive to interventions. Based on a gaming platform, participants will be provided personalized feedback and a prescription of supplemental resources targeted to enrich their learning and performance. The new ASA Interactive Computer-based Education Editorial Board oversees the project and will use the compiled data on performance to develop future SimSTAT modules and other computer-based educational products.

Within the realm of graduate medical education (GME), residency and fellowship programs are aligned with the same trends in simulation-based training discussed above. Specifically, an increasing number of Anesthesiology training programs have developed robust simulation curricula to assist clinical teaching, and simulation is a core requirement for residency programs accredited by the Accreditation Council for Graduate Medical Education (ACGME). Simulation has become an important adjunct to clinical training, designed to reduce medical errors and enhance patient safety. Example of simulation curricula include orientation to practice, basic and advanced airway management, central venous access, crisis resource management, team training, and subspecialty training in critical care, pediatrics, trauma, and obstetrics – to name a

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An Update on Simulation

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few. There continues to be growing evidence that simulation training leads to improved knowledge, skills and behaviors in the laboratory, which can transfer to patient care and improved outcomes.³⁻¹⁰

In addition to the formative curricula discussed above, there are summative curricula in the form of Objective Structured Clinical Examination (OSCE). A trainee's competency is assessed in alignment with current ACGME milestones –a joint initiative of ACGME and the ABA.⁸ Training programs use this and other clinical competency data in the semi-annual report of resident performance and reporting. Summative assessment curricula allow for quality assurance of the training program per se, as it aids in the identification of areas with an opportunity for improvement. Moreover, it prepares the trainees for the ABA certification which now includes an OSCE component in addition to the traditional oral examination.

Residency programs collaborate and share simulation curricula design with other Anesthesiology programs as well as programs in other disciplines, including Internal Medicine, Surgery, Emergency Medicine and Nursing, among others. Examples include milestone assessment and OSCE workshops during the International Meeting for Simulation in Healthcare (IMSH). In addition, the Simulation Education Network holds an annual conference, the SEN Summit, each spring at ASA headquarters in Schaumburg, IL. This year's meeting, on April 8, 2017 featured Anders Ericsson, PhD, as keynote speaker. He discussed his new book, *Peak: Secrets from the New Science of Expertise*, and suggested how deliberate practice and mastery learning in other disciplines relates to the practice of Anesthesiology. The conference featured educational topics of interest not only to the simulation network but to all educators in the field of Anesthesiology.

Visit the ASA website to find a Simulation Education Network program near you and to learn more about simulation-based offerings. For GME formative and summative curricular design as well as milestone assessment, visit the IMSH website.

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EAB Report: Entrustable Professional Activities: An Introduction to a New Assessment Tool in the Milestones Era



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A Brief History of the ACGME Outcomes and The Milestone Project

As part of the Outcomes Project in 1999, the Accreditation Council for Graduate Medical Education (ACGME) outlined six core competencies that have served as the basis of resident assessment and curricula re-design: patient care, medical knowledge, practice based learning and improvement, interpersonal and communication skills, professionalism, and systems based practice. These general categories serve as a theoretical construct that are comprehensive in their scope, representing domains that are essential attributes for all physicians.¹ In 2013, the ACGME announced the Milestones Project, which is intended to provide a more explicit definition of expectations surrounding resident knowledge, skills, attributes and performance in a specialty-specific manner. The purpose of the Milestone Project is to address the difficulties in measuring resident performance outcomes using the core competencies alone. The overarching concept of Milestones is to describe sub-competencies under each of the six core competencies and map these to increasing levels of skill through five levels. These progressions are intended to represent the range of physician ability from novice to advanced beginner to competent to proficient to expert, and at each stage residents and fellows are expected to assume increases in responsibility for patient care activities.²

Despite the Core Competencies being the pivot point around which the GME paradigm shift from knowledge acquisition to knowledge application has occurred, a clear understanding of this assessment system is often lacking for many faculty who are responsible for the training (and assessment) of future anesthesiologists.³ While many faculty and trainees are familiar with the verbiage of the ACGME Core Competencies and appreciative of their intent for outcomes assessment and meeting the challenge of societal accountability, there remains a disconnect when attempting to utilize them as evaluative tools within a realm of daily clinical activity. This divide creates confusion and separates theory from practice. As has been noted by ten Cate and Scheele, “supervisors and trainees need to know which educational targets are important to attain, and they must know what, specifically, will be assessed. A general competency is difficult to assess, but the ability to execute a specific activity can be observed and appraised.”¹ Additionally, as Jonker summarized “the true goal of training should not be to attain competencies, but rather to become a doctor with expertise, who is ready to bear professional responsibility and who can be entrusted with the care of patients.”⁴ The implications of the term “entrusted” are profound and far-reaching, describing a fundamental aspect of medicine as a whole. The trust of a patient for his or her individual physician is an essential component of care, and the trust that society places in faculty to train and graduate competent anesthesiologists is core to our social contract. In that, as clinician-educators, we must balance our trust in a resident’s performance of an assigned task with that of patient safety and situational appropriateness. In extending our personal accountability to those we oversee, objective justification for allowing indirect supervision, is largely lacking.

Entrustable Professional Activities: What are they?

Into this milieu, the concept of ‘entrustable professional activities’ (EPAs) has emerged.⁵ In redirecting our clinical educational efforts towards shaping our residents as “doctors with expertise” within the framework of competency based graduate medical education, the concept of EPAs serve as a potential solution. “EPAs are those professional activities that together constitute the mass of critical elements that operationally define a profession.”¹ These clinical activities are specialty-specific, and encompass competencies from several different domains, such as medical knowledge, technical skills, and professional behaviors that can be mapped to the ACGME Core Competencies, subcompetencies, and Milestones. EPAs thus create an observable linkage between the Core Competencies and Milestones systems and the daily clinical activities performed by a physician within a specialty. As an assessment tool, EPAs are at the top of Miller’s Pyramid of Clinical Competence, evaluating what a learner “does”

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through direct observation.⁶ Likewise, they may be employed as a basis for defining entrustment decisions regarding resident performance of a specific activity with increased autonomy.

EPAs define tasks in a clinical context that are easily recognizable as common practice and therefore facilitate enhanced and accurate assessment by faculty. Similarly, EPAs may develop in complexity along the spectrum of specialty specific GME, providing assessment tools of senior level tasks mapped to upper level Milestones sub-competencies. Examples of junior resident EPAs (CA-1) might be: patient hand-off in PACU, admission of a critically ill patient to the ICU, conduct general anesthesia for an ASA I/II patient in an ambulatory surgery center, or perform anesthesia for a cesarean delivery in an uncomplicated parturient. Individual procedures such as arterial line placement, or placement of a double-lumen endotracheal tube in and of themselves are not considered EPAs, but may be incorporated into an advanced resident rotation-specific EPA, such as conduct anesthesia for a thoracoscopic pulmonary lobe resection in a patient with severe cardiac systolic dysfunction (Table 1). Graded progression from directly supervised to unsupervised EPAs throughout the residency training period helps foster an environment whereby the resident desires to continually attain increasing levels of mastery. However, incumbent upon this is the necessity

for engaged supervising faculty who can provide consistent guidance and directed feedback to aid in this progression of clinical growth and professional development.

Relationship of EPAs, Core Competencies, and Entrustment Decisions

ten Cate and Scheele have merged the coexistence of competencies and EPAs and stated that they are not mutually exclusive but rather two dimensions on a grid, termed a competency-activities matrix (Table 2). “By observing performance of an EPA, one implicitly observes several domains of competence.”⁷ EPAs permit clarification of performance expectations for the resident, clearly defining individual responsibility associated with five specific levels of task/activity proficiency; novice, advanced, competent, proficient, and expert consistent with the Dreyfus Model of Skill Acquisition.^{8,9} These may correspond appropriately to levels of increasing independence and decreasing direct supervision.^{4,10} Entrustment decision-making may be supported by repeated observations of a trainee achieving a determined threshold of competence (level 3 of 5, on Table 1) for a specific EPA. Continual repetition and experience will only strengthen the trainee’s proficiency of this EPA, working towards mastery or expertise. In approaching the highest levels of performance,

Table 1: An example of Senior Level EPAs for a Multispecialty (MSA) Anesthesiology rotation in context of Supervision Assessments on a Faculty Completed Evaluation Form. This scale, when utilized with repeated observations by multiple faculty may be a basis for entrustment decisions.

EPA	The resident is trusted to participate in this activity	Only as an observer	With direct supervision	With indirect supervision	Independently	As an instructor of junior colleagues	Did not observe
1	Laparoscopic gastric bypass in a 57 year old female with a history of paroxysmal atrial fibrillation and CAD.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Exploratory laparotomy for a single gunshot wound to the abdomen in an older male with moderate to severe COPD.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Pancreatoduodenectomy in a 65 year old male with known carotid stenosis and a LVEF of 25%.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Exploratory laparotomy for bowel perforation in a 79 year old male with early severe sepsis requiring goal-directed resuscitation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Emergent exploratory laparotomy for a Level I trauma patient following a high-speed MVC for which the massive transfusion protocol has been initiated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table 2: An example of EPAs from Table 1 mapped to sub-competencies in the Milestones system. Each EPA spans multiple Core Competency domains.

	PC										MK	PBLI				ICS			P					SBP			
	1	2	3	4	5	6	7	8	9	10	1	1	2	3	4	1	2	3	1	2	3	4	5	1	2		
EP A1	X	X	X					X	X	X					X	X	X	X								X	
EP A2	X	X			X				X					X	X	X	X	X							X		
EP A3	X	X	X				X		X	X				X	X	X	X								X		
EP A4	X	X	X			X			X					X	X	X	X										
EP A5	X	X		X	X	X		X	X					X	X	X	X	X							X		

the concepts of self-assessment and individual performance improvement should be evident and serve as the primary feedback mechanism for effective lifelong learning. Even after separation from supervised task performance, the trainee should never be dissuaded from asking for assistance, just as a faculty member might request assistance in a specific circumstance and while a trainee, all ACGME requirements of faculty oversight are expected.¹¹ Clearly, successful implementation of an EPA based-Milestones linked curriculum, requires very clear goals and objectives for both the trainee and faculty, mandating learner and educator development and reinforcement, and effective feedback mechanisms utilizing direct observation, for trainee assessment.

Conclusions and Future Directions

EPAs are an available, but not mandated tool, which offer distinct assessment advantages when mapped to ACGME Competencies and Milestones. This interdependent relationship acknowledges the design and intent of the ACGME domains, while conceptualizing generalities in terms of competence for specialty specific performance tasks. In developing a competency-based medical education curriculum, the key lies in understanding that adaptation for successful evolution of an educational system does not exist in structural component change, but in delineating practically applied performance outcomes for learner groups spanning an entire career. As educators, in a future of increasingly specialized medicine, it is obligatory for us to establish the thresholds for identified task competence, while assuring progressive independence and professional development of our trainees, balanced with our responsibility to patient safety. Commitment towards learner group empowerment by incorporating EPAs as a stratagem for a continuum of competency based medical education can create

a perpetuating environment for lifelong learners, developing experiential self-assessment and continued reflective improvement practices, which extend beyond completion of residency.¹²

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Subspecialty Update: Hospice and Palliative Care Medicine



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Hospice and palliative care medicine represents the newest, and likely the most poorly understood medical subspecialty. The American Board of Hospice and Palliative Medicine was

established in 1996. The American Board of Medical Specialties extended subspecialty recognition to Hospice and Palliative Medicine (HPM) in 2006. Physicians from 10 medical specialties are eligible for subspecialty designation as hospice and palliative care medicine, included in this number are Diplomates of the American Board of Anesthesiology (ABA).

The primary goal of palliative care is to improve the quality of life for patients and families who are confronted with the suffering associated with serious life-threatening illnesses. This is achieved by the identification and management of pain and suffering, and other symptoms. It involves an interdisciplinary approach which includes dealing not only with physical symptoms, but also with emotional, psychosocial, spiritual, and existential domains. Palliative care is appropriate to be offered to a patient at any time during the trajectory of a life-threatening illness, whether or not they are seeking curative treatment.

Hospice care is a specific subset of palliative care. It is primarily a Medicare benefit that is designed for those patients who have a life expectancy of 6 months or less if her disease state runs its normal course. It is appropriate for patients who either have an illness for which no further treatment is possible, as well as for patients who opt to discontinue treatments because they have become unnecessarily burdensome. All hospice care is palliative in nature, but all not all palliative care is hospice.

The subspecialty of palliative care medicine has shown tremendous growth over the past few years. Currently there are 6952 board-certified hospice and palliative care physicians in the United States. Of that number, 117 are Diplomates of the American Board of Anesthesiology. The American Academy of Hospice and Palliative Medicine estimates the current need for HPM physicians is approximately 15,000 FTEs. This represents a significant short fall, particularly considering that many hospice and palliative medicine physicians do not practice the subspecialty on a full-time basis. There are currently 117 ACGME accredited fellowship programs, and they are approved for a total of 380 fellows per year. This represents a significant short fall of fully trained hospice and palliative care physicians for the foreseeable future.

The window of opportunity for board certification by “grandfathering” closed in 2012. The Board certification examination is currently biannually on either even-numbered

years. In addition to successful completion of the exam, requirements for ABA certification as a hospice and palliative care physician include:

- 1). Board certification by the ABA, 2). Possession of a current, unrestricted license to practice medicine in the United States or Canada, 3) Satisfactory completion of a 12-month ACGME-accredited hospice and palliative medicine fellowship, 4). Active involvement in the practice of HPM for at least an average of one day a week for 12 consecutive months within the previous 3 Years, 5). Ability to perform the entire scope of practice (with reasonable accommodation if required), 6). Compliance with Maintenance of Certification in Anesthesiology Program (MOCA) requirements.

Many anesthesiologists have found the subspecialty of hospice and palliative medicine to be highly rewarding and challenging. It is an opportunity to make a real difference in the lives of patients and families who are dealing with tremendous suffering. It provides the opportunity to make a significant positive impact in the patient’s quality of life, while simultaneously benefiting the overall healthcare system by reducing the cost of healthcare for those patients drawing near the end of life.

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AUA Member Profile • BIOGRAPHY

Warren Zapol, MD

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Warren M. Zapol, MD

The Zapol Glacier (78o35'S 85o51'W) in Antarctica was named after Warren M. Zapol, M.D. by US-ACAN (Advisory Committee on Antarctic Names) in 2006 (<https://goo.gl/G01yWv>). While admittedly shorter by many orders of magnitude, the trajectory of Zapol's academic career may be viewed as akin to the growth of his eponymous glacier. When accumulated snow survives the season and does not melt, it forms a denser, more compressed layer, which increases over time. Such is the academic career of Dr. Warren Zapol. His solid career is built upon layers of achievements that were motivated by his desire to study survival in hypoxic conditions in order to improve clinical care for all. Dr. Zapol's contributions to respiratory failure in neonates, including ECMO and nitric oxide, have led to his recognition as a world-renowned expert in the treatment of the disease. To this day, Dr. Zapol continues to investigate the mysteries of nature that allow for survival in conditions of low oxygen not otherwise tolerable. At the age of 74, his most recent laboratory investigations point to the use of hypoxia to treat mitochondrial disease (Science 2016, 352:54-61).

Persistence and self-motivation are two key features to the life and career of Dr. Zapol. Zapol grew up in Brooklyn, New York. His mother was a teacher and his father a businessman. He went to Stuyvesant High School, attended Massachusetts Institute of Technology at the age of 16 and graduated from the University Of Rochester School Of Medicine (1966). He had excellent mentors and collaborators. Jerome Lettvin and Patrick Wall influenced his early career at MIT. At Rochester, Drs. Wallace Fenn and Alastair Gilles, encouraged a career in anesthesiology. Drs. M. Judah Folkman and John C. Norman inspired Zapol during his surgical internship on the Harvard Surgical Service at Boston City Hospital to use his laboratory knowledge and investigations to improve clinical care.

Like a glacier, which changes its shape and speed due to external forces. Zapol was influenced by the thoughts and findings of others. He spent three years (1967-1970) at the NIH working with Dr. Theodor Kolobow. Using a novel silicone membrane oxygenator, developed by Kobolow, Zapol studied ductal closure during long-term perfusion of fetal sheep. His interest in the possible application of this device to various forms of respiratory failure led him to posit that it might be

useful to treat wounded soldiers during the Vietnam War, who had developed pulmonary edema and respiratory distress, called "Da nang lung" which was another name for acute (now "adult") respiratory distress syndrome (ARDS).

Dr. Richard Kitz recruited Zapol to Massachusetts General Hospital (MGH), in 1970. A unique recruitment at the time, in that Zapol came directly from the NIH and continued his research supported by an NIH grant during his anesthesia residency. He went on to spearhead the MGH ECMO program.

The Department of Anesthesiology established at MGH by Dr. Henry Beecher, was one of the first anesthesia departments in the United States, and thanks to Dr. Henning Pontoppidan, had one of the first of three respiratory care units established in the United States. Great clinicians and researchers, including Dr. Myron Laver (who established one of the first blood gas labs in the U.S) as well as Dr. Pontoppidan, provided an exciting and fertile environment for Zapol

NIH, which awarded his team funding for a multi-institutional, prospective study, recognized Zapol's work on the ECMO randomized study supported by the National Institute of Health, for which Warren was the PI. The results of this study, published in JAMA 1979, showed

that venoarterial extracorporeal membrane oxygenation was not a reliable bridge to recovery in adult patients with acute respiratory distress syndrome. Nonetheless, the study provided the basis for continued NIH funding (1978-1988) for Zapol's research studying mechanisms of respiratory failure and hypoxemia in these and other patients.

Zapol's internationally-recognized expertise in respiratory failure was requested in several memorable cases. In 1979 Zapol responded to an emergency request to go to Moscow. The daughter of the leading Soviet cardiac surgeon was suffering from respiratory distress following a hysterectomy. Within a matter of hours of the call, and without a visa, Zapol was whisked on a Soviet airliner from JFK to Moscow, bringing an ECMO machine and Emerson ventilator with Positive End Expiratory Pressure ("The Emersonsky ventilator with Bolshoi PEEP") with him. Thanks to the advice of MGH infectious disease guru Dr. Mort Swartz, Warren also took BBK8, later known as Amikacin, to Russia, contributing to the arsenal that permitted her recovery. After a few weeks in Moscow, during which time even the local telephone operators were inquiring as to the health of his patient as well as the Zapol family back



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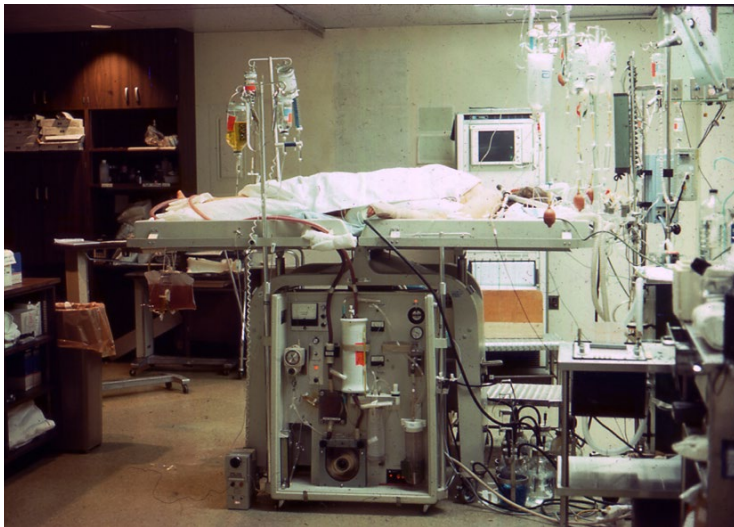
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in Boston, Dr. Zapol's patient recovered, and is a friend of the Zapols to this day.

Michael Rie, a colleague of Zapol, tells the story of a phone call to Warren from a trauma surgeon in Peoria, IL about a young girl who, having aspirated during delivery of a term infant, was in significant respiratory distress. Through Rie's efforts, Zapol's "machine" could be transported in a Mobile Home. Zapol being the idealist called the Department of Defense and requested an aircraft command DC-9 air ambulance, which could house the mobile unit. It worked. The medevac team took their mobile unit to Logan Airport, flew to Illinois in a U.S. airforce plane and drove their mobile unit to the ICU in Peoria. The young lady survived, again because of the team's excellent treatment. After the team returned to Boston, Zapol learned that the Lieutenant Colonel Surgeon of the Airforce had contacted Larry Martin, the Treasurer of the MGH, to ask that the hospital reimburse the government the \$29,000 spent on fuel for the transport. Zapol responded, "What is the value of a saved healthy 21 year old American mother?" So far as anyone can recall, the government was not reimbursed.

Back in the research arena, in collaboration with Dr. Reginald Greene, a radiologist and Dr. Lynne Reid, a pathologist, Zapol determined that vascular obstruction, as a result of thrombosis in the pulmonary vasculature, was a causative factor of the elevated pulmonary vascular resistance. This differentiated ARDS as a vascular disease, which involved the pulmonary endothelium, from airways diseases, such as atelectasis and pneumonia. Zapol realized that a selective pulmonary vasodilator would prove to be more beneficial in the treatment of pulmonary hypertension.



"Blue babies" suffering from hypoxemic respiratory failure inspired most of Zapol's future work. Zapol, inspired by the (later Nobel-prize winning) work of Louis Ignarro and other investigators, in 1999 began investigating in lambs a non-anesthetic gas, nitric oxide. Warren came up with what seemed at the time a crazy idea: that you could breathe this "toxic"

gas to selectively dilate the pulmonary vasculature. He called the FDA with his plan. They responded: "All the gases are grandfathered; you do not need our approval. Just ask your local IRB." Despite this pass from the FDA, human investigation of this toxic gas, which Zapol conducted with Drs. Jesse Roberts and David Polaner, met with difficulty. Zapol recalls that nitric oxide tanks bore skull and crossbones, which had to be turned from view so as not to erode confidence in the families of potential newborn participants. Their efforts bore fruit. Nitric oxide, which became subject to FDA approval in the interim, was approved as a therapeutic by the FDA in 1999 and is now a standard of care in the United States and many other countries. Despite this widespread acceptance, its expense and cumbersome cylinders and devices remain limiting factors to the use of nitric oxide in disadvantaged countries as well as in out-of-hospital venues where it has the potential for use beyond persistent pulmonary hypertension of the newborn. Once again, forging ahead, Zapol and his son, David, have recently developed and studied electric plasma-generated nitric oxide (*Am J Resp and Crit Care Med* 2016; 194:1168-1170).

At the early age of 45, Zapol was a full Professor at Harvard with his clinical appointment at Massachusetts General Hospital. He was appointed the Reginald Jenny Chair at Harvard in 1992. From 1994-2008, he was Anesthetist-in-Chief at MGH. Zapol received the American Society of Anesthesiologists Excellence in Research Award in 1999, was elected to the National Academy of Medicine (formerly the Institute of Medicine) in 2002, received the Intellectual Property Owners (IPO) Association "Inventor of the Year" award in 2003, and will be sworn in as a Fellow of the National Academy of Inventors in 2017.

Zapol's wide-ranging interest in the physiology of breathing brought him to places far removed from his laboratory in Boston. He studied the breath-hold diving women of Korea and Japan. He established the farthest south laboratory of the MGH, in Antarctica, studying the diving secrets of the Weddell seals. Perfecting the use of microcomputers with colleague Roger Hill over a twenty-year period in which he led many Antarctic expeditions, Zapol and his team discovered how Weddell seals tolerate conditions of low oxygen during long dives (over an hour 600m below the ice). Their flexible rib cage and rigid tracheobronchial tree allows the seal to maintain low arterial nitrogen concentrations, while a higher myoglobin and hematocrit allow for improved oxygenation. Weddell seals have a remarkable spleen that contracts releasing red cells for extended bouts of deep diving. Recognizing Zapol's expansive investigative efforts in the polar region, President Bush appointed him in 2008 and President Obama reappointed him in 2012, as the academic representative to the U.S. Arctic Research Commission.

Son David accompanied Warren in 1992 on one of his "Antarctic Adventures". An undergraduate at MIT at the time, he became part of the Zapol team's efforts to understand the Weddell seal's diving reflex. Working in Antarctica from late August to December of that year, David said it was the time

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of the year where “the sun stopped setting and the moon would circle overhead. There was no night or day but the only determinant of time was the four times a day you would return to the mess hall in McMurdo station to have a meal.” He recalls driving 40 km across the ice to set up seal huts over a 3 feet wide/6 feet deep hole drilled into the ice. He remembers putting a computer on the seal’s back, watching the seal dive and then downloading the data after surfacing. David also watched and waited for the return of a Weddell seal from the longest dive ever recorded at that time, at 93 minutes.



It was on this expedition that David met Diana Laird, then a lab tech for another Antarctic researcher, now a stem cell biologist at UCSF. They later married and had a daughter Ruth Karoline, named after the first woman to set foot on Antarctica, Karoline Mikkelsen. David is one of two children born to Warren and his wife Nikki, an attorney. David’s sister, Liza, is an oral historian, now working for the Smithsonian. Over the past year, Liza has interviewed and recorded her father, giving us a rich narrative of his life. She, too, has shared in her father’s extreme adventures, having accompanied him when he lectured

for Harvard on a tourist expedition, crossing the stormy seas from Australia to McMurdo in an icebreaker, and reaching what may at the time have been the furthest south reached by ship. Liza’s memory of that trip includes a harrowing night when her father and the ship’s doctor took off in a helicopter to meet a twin otter on the Antarctic continent to medevac a very sick passenger to McMurdo.

Warren and Nikki met through Joe Silk, one of the first proponents of the Big Bang theory of the origin of the universe. They married in Washington, D.C. in 1963. As David would say “I like to think of our family as cosmic”. Warren and Nikki have instilled in their children a compelling desire for humanitarianism and adventure. Through joint efforts with his son, David, Warren spun the company Third Pole, Inc. out of MGH. Third Pole’s vision is to develop cardiopulmonary innovations so they reach patients worldwide, starting with Warren’s invention of NO generation from air. They are motivated to benefit humankind with important treatments like inhaled nitric oxide.



Dr. Warren Zapol is a visionary whose hard work and dedication has merited sustained funding by the NHBLI and resulted in life-saving treatment of thousands of children and adults suffering from pulmonary distress. He is well-known for his studies in extracorporeal membrane oxygenation, seminal papers in acute respiratory distress syndrome and cardiopulmonary physiology in animals and humans. He presented the John W. Severinghaus lecture on translational research at the American Society of Anesthesiologists Annual Meeting (2010) and received the “Distinguished Scientist” award by the American Heart Association (2012). In 2011, he sailed from Marion, MA to Bermuda in a Sabre 362 named “Mabuhay” (which means “long life and good health” in Tagalog). Motion and change define a glacier’s life and so define that of Dr. Zapol. His unbounded inquisitive nature led him in unconventional directions to seek and find medical solutions to physiological challenges and have given him a “glacial” prominence that is an inspiration to us all.

Syllabus

AUA 64th Annual Meeting | May 4-5, 2017

Grand Hyatt Washington, Washington, DC



Hosted by

Johns Hopkins Medicine and University of Maryland School of Medicine



Program Schedule

Thursday, May 4

6:00 am - 6:00 pm **Registration**

8:30 am - 9:00 am **Welcome from AUA President and Host Institution Chairs -**
Colleen Koch, MD, MS, MBA, FACC
Peter Rock, MD, MBA, FCCM
Jeanine P. Wiener-Kronish, MD

9:00 am - 10:00 am **Scientific Advisory Board (SAB) Oral Session I**
Moderators: Lucy Chen, MD, and Edward Sherwood, MD, PhD

**Junior Faculty
Research Award**

- ***Photo-Relaxation: Light Mediated Airway Smooth Muscle Relaxation***
Peter Yim, MD, Columbia University Medical Center, New York, New York
- ***Alteration in Bitter Taste Receptor (TAS₂R) Expression and Function in the Airway Smooth Muscle Cells of a Murine Model of Cystic Fibrosis***
Nicholas M. Dalesio, MD, Johns Hopkins Medicine, Baltimore, Maryland

**Junior Faculty
Research Award**

- ***Implication of LDL Receptors in the Development of Pulmonary Hypertension***
Soban Umar, MD, PhD, University of California, Los Angeles, David Geffen School of Medicine, Los Angeles, California
- ***Spinal Cord Stimulation Reduces Ventricular Arrhythmias During Acute Ischemia Through Attenuation of Regional Myocardial Excitability in A Porcine Model***
Kimberley Howard-Quijano, MD, MS, University of California, Los Angeles, David Geffen School of Medicine, Los Angeles, California

Learner Objectives: After participating in this activity, the learner will be able to: (1) Discuss novel mechanisms to bronchodilation; (2) Appraise light-based approaches to bronchodilation; (3) Define the implications of lipid signaling in vascular disease; and (4) Identify emerging interventions for arrhythmias.

10:00 am - 11:30 am **Moderated Poster Discussion Session I**

Learner Objectives: After participating in this activity, the learner will be able to: (1) Describe the latest developments in anesthesiology research in basic, clinical and population science; (2) Examine recent research findings relative to anesthesiology and evaluate their application to the learner's own research and clinical practice; and (3) Construct strategies for integrating new knowledge into anesthesiology research programs.

Program Schedule, *continued from page 19*

11:30 am - 12:30 pm **SAB Oral Session II**

Moderators: Lucy Chen, MD, and Edward Sherwood, MD, PhD

Resident Travel Award

• ***Sensitivity to Volatile Anesthetics Predicts Postoperative Delirium***

Bradley A. Fritz, MD, Washington University School of Medicine in St. Louis, St. Louis, Missouri

Margaret Wood Resident Research Award

• ***Weak EEG α -Power During General Anesthesia as a Marker of Delirium in the PACU***

Matthias Kreuzer, PhD, Emory University School of Medicine, Atlanta VA Medical Center, Decatur, Georgia

• ***Astrocyte-Specific Knockout of a Mitochondrial Protein in Mice Increases Neural Inertia***

Renjini Ramadasan Nair, PhD, Seattle Children's Research Institute, Seattle, Washington

• ***GABA Neurons in the Rostromedial Tegmental Nucleus Modulate Arousal and Anesthetic Sensitivity in Mice***

Ken Solt, MD, Harvard Medical School; Massachusetts General Hospital, Boston, Massachusetts

Learner Objectives: After participating in this activity, the learner will be able to: (1) Discuss the mechanisms contributing to postoperative delirium; (2) Illustrate the role of mitochondrial pathways in neuronal dysfunction; and (3) Interpret the role of inhibitory transmission pathways in arousal and anesthetic sensitivity.

12:30 pm - 1:30 pm **All Attendee Lunch**

12:30 pm - 1:30 pm **Educational Advisory Board Lunch – Invite Only**

12:30 pm - 1:30 pm **President's Lunch – Invite Only**

1:30 pm - 3:00 pm **Educational Advisory Board (EAB) Program Panel I: The Science of Assessment of Clinical Performance**

Moderator: Robert R. Gaiser, MD

• ***The Science of Clinical Performance Assessment***

John (Jack) R. Boulet, PhD

• ***Clinical Application of Clinical Performance Assessment***

Feroze-Ud-Din Mahmood, MBBS

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Program Schedule, *continued from page 19*

- **Performance Assessment for Re-entry**

Adam Levine, MD

Learner Objectives: After participating in this activity, the learner will be able to: (1) Summarize the various types of simulation-based assessment currently employed in medical education; (2) Discuss how meaningful scores can be obtained from performance-based assessments; (3) Identify psychometric evidence that must be gathered to support the use of assessment scores; (4) Evaluate the challenges and potential benefits of using clinical performance assessment; (5) Discuss the need for healthcare reentry programs; (6) Identify the reasons healthcare providers require reentry programs; (7) Evaluate the role for competency assessment for healthcare re-entry; and (8) Evaluate the role of simulation for reentry assessment.

3:00 pm - 4:15 pm

Host Program Panel I

Moderators: Colleen Koch, MD, MS, MBA, FACC and Peter Rock, MD, MBA, FCCM

Presenters:

- **Agent-Based Modeling in Health Science: From Playground to Planet**

Joshua Epstein, PhD

- **Irrationality in Health Care: Why Patients and Physicians Do Not Always Choose Wisely**

Douglas E. Hough, PhD

Learner Objectives: After participating in this activity, the learner will be able to: (1) Identify the ubiquity of models; (2) Examine the cutting edge of computer simulation in Health Science; (3) Assess how this flexible technology could apply to your field, be it infectious disease, critical care, environmental health, at scales from the ICU to the Globe; (4) Identify the situations in which health care behavior can be irrational; (5) Review the major concepts of behavioral economics that can explain irrational behavior; and (6) Assess the challenge of changing patient and physician behavior.

4:15 pm - 4:30 pm

Break

4:30 pm - 5:45 pm

Host Program Panel II

Moderators: Colleen Koch, MD, MS, MBA, FACC, and Peter Rock, MD, MBA, FCCM

- **Developing and Deploying Influenza Vaccines: The Pandemic-Seasonal Interplay**

Kathleen M. Neuzil, MD, MPH, FIDSA

Continued on Page 21

Program Schedule, *continued from page 20*

- ***The Beginning of the End of Hepatitis C – 2017***

Shyamasundaran Kottlil, MD

Learner Objectives: After participating in this activity, the learner will be able to: (1) Review the currently licensed influenza vaccines and those in development; (2) Discuss the role of market forces in shaping the influenza vaccine pipeline; (3) Discuss the global public health burden of chronic hepatitis C infection; (4) Describe recent advances in the treatment of HCV; (5) Assess the impact of HCV treatment on long term complications including cancer and transplantation; and (6) Identify challenges in global elimination of HCV.

6:30 pm - 8:00 pm ***British Journal of Anaesthesia & Anaesthetic Research Society Reception***

Friday, May 5

6:00 am - 6:00 pm **Registration**

7:30 am - 8:00 am **AUA Sunrise Session – Non-CME Session**

8:00 am - 9:00 am **SAB Oral Session III**

Moderators: Peter A. Goldstein, MD, and Tomoki Hashimoto, MD

- ***CX₃CR1⁺ Cells in the PNS Play A Key Role in Development of Neuropathic Pain in Mice***

Jianguo Cheng, MD, PhD, Cleveland Clinic, Cleveland, Ohio

- ***Corticostriatal Circuit Regulates Acute and Chronic Pain in Rodents***

Jing Wang, MD, PhD, New York University School of Medicine, New York, New York

Junior Faculty Travel Award in Perioperative Medicine

- ***A Randomized Trial of Perioperative Gabapentin to Promote Pain Resolution and Opioid Cessation in a Mixed Surgical Cohort***

Jennifer Hah, MD, MS, Stanford University School of Medicine, Stanford, California

- ***Dezocine for Opioid Addiction in A Rat Morphine Dependence Model***

Renyu Liu, MD, PhD, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania

Learner Objectives: After participating in this activity, the learner will be able to: (1) Discuss novel immune mechanisms in neuropathic pain; (2) Identify the role of descending pathways in acute and chronic pain regulation; and (3) Assess novel approaches to reducing opioid use.

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Program Schedule, continued from page 21

9:00 am - 9:15 am Break

9:15 am - 10:15 am **SAB Oral Session IV**

Moderators: Peter A. Goldstein, MD, and Tomoki Hashimoto, MD

- ***How Can We Safely Reduce 50% of Patient Monitor Alarms in the Surgical Intensive Care Unit?***

Peter Hu, PhD, University of Maryland School of Medicine, Baltimore, Baltimore, Maryland

Junior Faculty Travel Award in Pediatric Anesthesia

- ***Age at Exposure to Anesthesia in Children and Mental Disorder Diagnosis***

Caleb Ing, MD, MS, Columbia University Medical Center, New York, New York

- ***Perioperative Decline in High Density Lipoprotein Particles is Associated with Increased Risk of AKI after Cardiac Surgery***

Loren Smith, MD, PhD, Vanderbilt University Medical Center, Nashville, Tennessee

Learner Objectives: After participating in this activity, the learner will be able to: (1) Evaluate the use of non-invasive approaches to assessing fluid responsiveness; (2) Evaluate approaches to reducing alarm fatigue in the ICU; (3) Discuss the implications of anesthesia in pediatric neurodevelopment; and (4) Interpret the effect of lipid particles in postoperative kidney injury.

10:15 am - 10:30 am Break

10:30 am - 12:00 pm **EAB Program Panel II: The Evidence Behind the “Hot” Topics in Anesthesia**

Moderator: Robert R. Gaiser, MD

- ***Flipped Classroom***

Susan Martinelli, MD

- ***Spaced Education - What Is That and Why Should I Use It?***

Matthew McEvoy, MD

- ***Test Enhanced Learning: Stop Studying and Take a Test!***

Randall Schell, MD, MACM

Learner Objectives: After participating in this activity, the learner will be able to: (1) List the components of the flipped classroom method of education; (2) Describe the current state of the evidence supporting the flipped classroom educational method in graduate medical education; (3) Propose ways of implementing flipped classroom in anesthesiology education; (4) Assess how tests can be used beyond assessment to promoting learning; (5) Describe the benefit of retrieval practice in improving longer term retention of information; (6) Review select evidence in support of test-enhanced

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Program Schedule, *continued from page 22*

learning; (7) Discuss evidence-based ways to optimize test-enhanced learning including question type, repeated testing, and feedback; (8) Compare Spaced Education and traditional didactic education; (9) Discuss the evidence for using Spaced Education for driving knowledge acquisition and clinical practice improvement; and (10) Describe potential opportunities for applying Spaced Education in the perioperative arena.

12:00 pm - 1:00 pm All Attendee Lunch

12:00 pm - 1:00 pm Scientific Advisory Board Lunch – Invite Only

12:00 pm - 1:00 pm Junior Faculty, Fellow, Resident and Medical Student Lunch
Tables will be reserved for junior faculty members, fellows, residents and medical students and their sponsoring chair. AUA Council Members will also be present.

1:00 pm - 2:30 pm Moderated Poster Discussion Session II

Learner Objectives: After participating in this activity, the learner will be able to: (1) Describe the latest developments in anesthesiology research in basic, clinical and population science; (2) Examine recent research findings relative to anesthesiology and evaluate their application to the learner's own research and clinical practice; and (3) Construct strategies for integrating new knowledge into anesthesiology research programs.

2:30 pm - 2:45 pm Break

2:45 pm - 4:45 pm President's Panel: *Hypoxia is Not Always Bad for You?*

Moderator: Jeanine P. Wiener-Kronish, MD

Panelists:

- ***Oxygen and Humans: The Good, The Bad and The Ugly?***
Michael Grocott, BSc, MBBS, MD, FRCA, FRCP, FFICM
- ***Hypoxia and Damaged Mitochondria: Good News***
Vamsi K. Mootha, MD
- ***Mitochondrial Disorders: Towards a Therapy from Thin Air***
Lorenzo Berra, MD

Learner Objectives: After participating in this activity, the learner will be able to: (1) Discuss the effect of hypoxia on normal individuals as well as those with mitochondrial dysfunction; (2) Analyze why hypoxia may be beneficial in mitochondrial disease; and (3) Identify why too much oxygen is dangerous to our patients.

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Program Schedule, *continued from page 23*

4:45 pm - 5:45 pm **AUA Annual Business Meeting**

6:30 pm - 9:30 pm **AUA Social Event Reception**

Hosted by Johns Hopkins Medicine and University of Maryland School of Medicine

Smithsonian's National Air and Space Museum (600 Independence Ave SW)

Busing will be provided to this reception from the side door of the AUA Headquarters Hotel.

Saturday, May 6

Aligned Meeting Day at the IARS 2017 Annual Meeting

The following sessions are part of the IARS 2017 Annual Meeting and International Science Symposium. AUA registered attendees are invited to attend these IARS sessions as part of their AUA registration fee.

7:30 am - 8:00 am **Welcome and Opening Remarks**

8:00 am - 9:00 am **T.H. Seldon Memorial Lecture: *Vital Directions in Health and Medicine in Uncertain Times***

Victor J. Dzau, MD, President, National Academy of Medicine;
Chancellor Emeritus and James B. Duke Professor of Medicine, Duke University School of Medicine, Durham, North Carolina

9:00 am - 9:30 am **Break**

9:30 am - 12:30 pm **AUA Symposium: *Recognizing the "Painful" Truths of the Opioid Abuse Epidemic***

Moderator: Y.S. Prakash, MD, PhD, Chair, Scientific Advisory Board; Professor of Anesthesiology and Physiology, Chair, Division of Anesthesia Research, Vice Chair, Department of Anesthesiology and Perioperative Medicine, Chair, Department of Physiology and Biomedical Engineering, Mayo Clinic, Rochester, Minnesota

Panelists:

- ***Understanding and Responding to the Intersecting Issues Related to Pain and Opioid Misuse***

Wilson Compton, MD, MPE, Deputy Director, National Institute on Drug Abuse, Bethesda, Maryland

- ***FDA's Role in Addressing the Opioid Epidemic***

Ellen Fields, MD, MPH, Deputy Director, Division of Anesthesia, Analgesia, and Addiction Products (DAAAP), Office of New Drugs, Center for Drug Evaluation and Research, FDA, Silver Spring, Maryland

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Program Schedule, *continued from page 24*

- **Frontlines of the Opioid Epidemic**
Lynn Webster, MD, Vice President of Scientific Affairs, PRA Health Sciences; Immediate Past President, American Academy of Pain Medicine, Raleigh, North Carolina
- **Mechanisms of Opioid Abuse: Dissecting Necessary from Unnecessary Need**
Mary Jeanne Kreek, MD, Senior Attending Physician, Patrick E. and Beatrice M. Haggerty Professor, Laboratory of the Biology of Addictive Diseases, The Rockefeller University, New York, New York

6:00 pm - 7:30 pm IARS Alignment Reception
Grand Hyatt Washington
AUA Attendees Invited to Attend

Scholars' Program

The Scholars' Program requires pre-registration and an additional \$50 fee to attend.

- 9:30 am - 10:30 am Scholar-01: Introduction to the Translational Research Continuum**
Moderator: Michael Montana, MD, PhD, Pediatric Fellow, Department of Anesthesiology, Washington University School of Medicine in St. Louis, St. Louis, Missouri

Presenter:
George Mashour, MD, PhD, Executive Director, Translational Research, Office of Research, Executive Director, Michigan Institute for Clinical and Health Research, Associate Dean for Clinical and Translational Research, Medical School, Director, Center for Consciousness Science, Bert N. La Du Professor and Associate Chair of Anesthesiology Research, Associate Professor, Department of Neurosurgery, University of Michigan Medical School, Ann Arbor, Michigan
- 10:45 am - 11:45 am Scholar-02: Keynote Session: Rigor and Reproducibility Across the Translational Spectrum**
Moderators: Sinziana Avramescu, MD, PhD, FRCPC, Assistant Professor, Department of Anesthesia, University of Toronto; Staff Anesthesiologist, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; Regional Representative: International, eSAS, and

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Program Schedule, *continued from page 25*

Katie J. Schenning, MD, MPH, Assistant Professor, Department of Anesthesiology & Perioperative Medicine, Oregon Health & Science University, Portland, Oregon, Co-Chair Membership, eSAS

- ***Trouble in the Laboratory: Problems with Rigor and Precision***

James Eisenach, MD, President, Foundation for Anesthesia Education and Research, Immediate Past Editor-in-Chief, *Anesthesiology*

- ***Reproducibility Crisis in Scientific Research***

Steven L. Shafer, MD, Professor of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine, Stanford, California; Adjunct Associate Professor of Bioengineering and Therapeutic Sciences, University of California, San Francisco, San Francisco, California; Immediate Past Editor-in-Chief, *Anesthesia & Analgesia*

12:00 pm - 1:00 pm Scholar-03: Plenary Session I: Expanding Our Horizons in Anesthesiology Research Training

Moderators: Julie Freed, MD, PhD, Adult Cardio-Thoracic Anesthesiology Fellow, Department of Anesthesiology, Medical College of Wisconsin, Milwaukee, Wisconsin; Co-Chair Partnerships, eSAS, and

James W. Ibinson, MD, PhD, Assistant Professor, Department of Anesthesiology, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania

Panelists:

- ***Developing Skills in Commercialization: Adapting Elements of the NSF I-CORPs Program to Create A Customized Program for Academic Physicians***

Connie Chang, MBA, Managing Director, Fast Forward Medical Innovation, University of Michigan Health System, Ann Arbor, Michigan

- ***The Challenges of Building Diversity in Academic Anesthesiology***

Paloma Toledo, MD, MPH, Assistant Professor of Anesthesiology, Northwestern University Feinberg School of Medicine, Chicago, Illinois

1:00 pm - 2:00 pm Scholar-04: Lunch Session: Inspirational Tales of Career Success

Moderator: Michael S. Avidan, MBCh, Professor, Anesthesiology and Cardiothoracic Surgery, Director, INQUIRI, Division Chief, Cardiothoracic Anesthesiology and Cardiothoracic Intensive Care, Washington University School of Medicine in St. Louis, St. Louis, Missouri; President-Elect, AUA

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Program Schedule, *continued from page 26*

Panelists:

- ***How to Maximize Your Success in Academia: Tips for Junior Faculty***

Oluwaseun Johnson-Akeju, MD, Assistant Professor of Anaesthesia, Harvard Medical School; Anaesthesia, Critical Care and Pain Medicine, Massachusetts General Hospital, Boston, Massachusetts

- ***Anesthesia, Informatics & Health Policy: My Unexpected Journey to Nashville***

Jesse Ehrenfeld, MD, MPH, Associate Professor of Anesthesiology, Bioinformatics, Surgery, and Health Policy; Director of Education Research, Vanderbilt Office of Health Sciences Education; Associate Director, Anesthesiology & Perioperative Informatics Research Division, Vanderbilt University Medical Center, Nashville, Tennessee; Chair, Massachusetts Committee on LGBT Health, Chair, Massachusetts General Hospital LGBT Employee Resource Group, Member, Board Committee on Quality at Fenway Community Health Center

2:00 pm - 3:30 pm Scholar-05: NIH Funding for Transition to an Early Independence: Information Session and Q&A with NIH Representatives

Moderators: Aaron Norris, MD, PhD, Fellow, Neuroanesthesiology, Washington University School of Medicine in St. Louis, St. Louis, Missouri, Special Events Chair, eSAS, and

Vivianne Tawfik, MD, PhD, Instructor, Department of Anesthesiology, Perioperative and Pain Medicine, Assistant Director, Fellowship in Anesthesia Research & Medicine Program, Stanford University School of Medicine, Stanford, California; Co-President, eSAS

Presenters:

- ***Funding Opportunities for Early Career Investigators at the National Institute of General Medical Sciences (NIGMS)***

Alison Cole, PhD, Branch Chief, Pharmacological and Physiological Sciences Branch, Division of Pharmacology, Physiology, and Biological Chemistry, National Institute for General Medical Sciences, National Institutes of Health (NIH), Bethesda, Maryland

- ***Funding Opportunities for Early Career Investigators at the National Institute on Aging***

Luci Roberts, PhD, Director, Division of Planning, Evaluation & Analysis, Office of Planning, Analysis and Communication (OPAC), National Institutes of Health (NIH), Bethesda, Maryland

Jane Scott, ScD, MSN, Director, Office of Research Training & Career Development, National Heart, Lung, and Blood Institutes, National Institutes of Health (NIH), Bethesda, Maryland

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**4:00 pm - 5:00 pm Scholar-06: Plenary Session II: Precision Medicine:
What Anesthesiology Can Contribute**

Moderators: Michael Mathis, MD, Clinical Lecturer and T32 Research Fellow, Department of Anesthesiology, University of Michigan Medical School, Ann Arbor, Michigan, and

Elizabeth Whitlock, MD, MSc, Clinical Instructor and T32 Research Fellow, Department of Anesthesia and Perioperative Care, University of California, San Francisco, San Francisco, California; Co-President, eSAS

Panelists:

- ***Pharmacogenomics in Anesthesiology***

Debra A. Schwinn, MD, Associate Vice President for Medical Affairs, Professor of Anesthesiology, Pharmacology & Biochemistry, University of Iowa Carver College of Medicine, Iowa City, Iowa

- ***The National Precision Medicine Initiative***

Sachin Kheterpal, MD, MBA, Associate Professor of Anesthesiology, University of Michigan Medical School, Ann Arbor, Michigan; Member, NIH Advisory Panel on Precision Medicine

5:00 pm - 6:00 pm Scholars' Program Mentor-Trainee Reception

Grand Hyatt Washington

Based on rigorous evaluation of both mentors' skills and trainees' needs, goal-directed interactions will be catalyzed.

Science's Top 1%: Income Inequality in Science

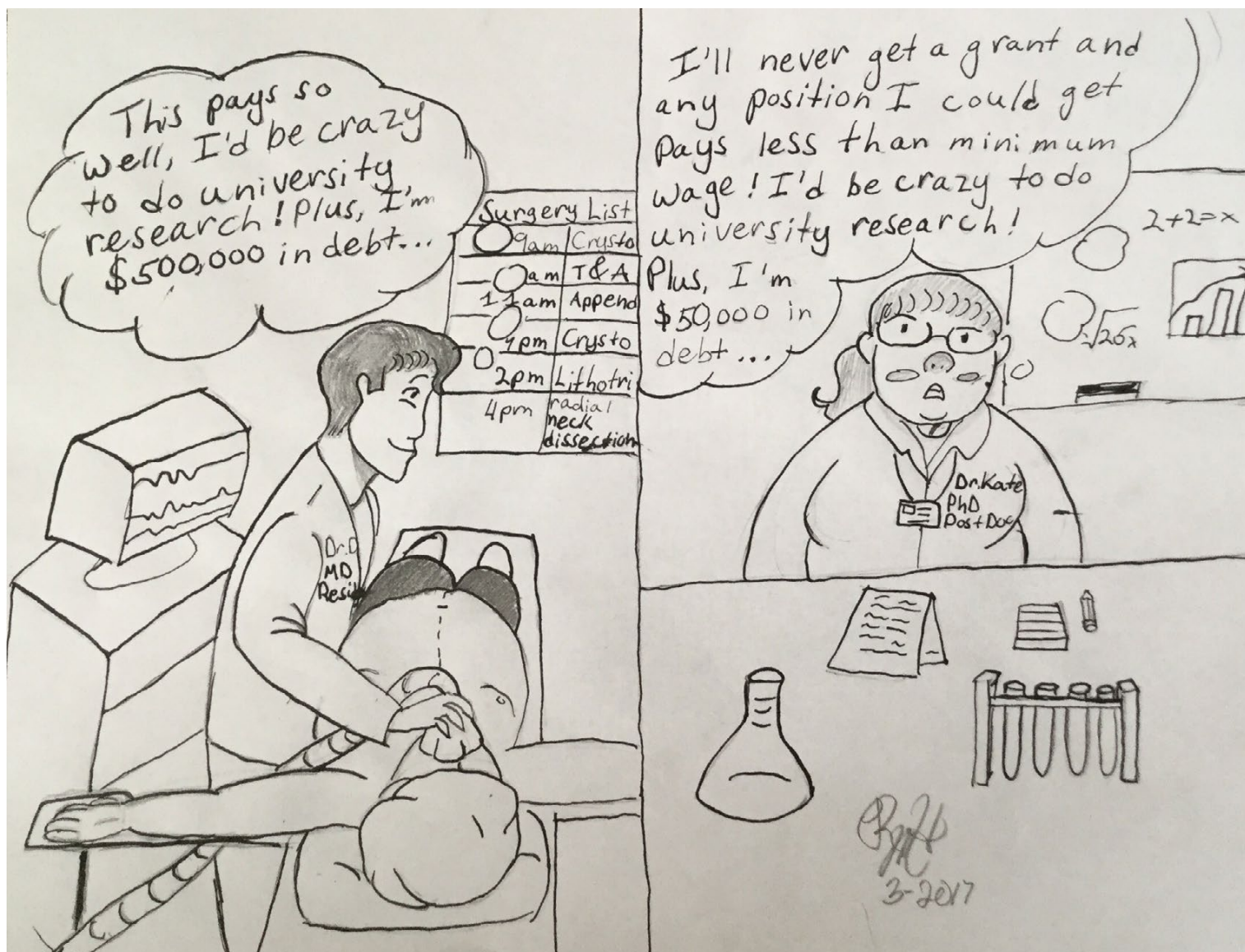
Excerpt from *Nature* article by Corie Lok, *Nature* Research Highlights Editor

“When labour economists measure disparities in salaries, one of the metrics they use is the Gini coefficient, named after an Italian statistician who developed the measure in the early twentieth century. A coefficient of 0 means that everyone earns the same. A value of 1 indicates maximum inequality — everyone earns nothing except for one person.

In her 2012 book *How Economics Shapes Science* (Harvard University Press), economist Paula Stephan at Georgia State University in Atlanta calculated the Gini coefficient for science

and engineering faculty members at US doctorate-granting institutions, using salary data from the US National Science Foundation’s *Survey of Doctorate Recipients*. She found that the Gini coefficient more than doubled between 1973 and 2006 in most fields and faculty ranks, with the biggest increases in the life sciences (see ‘Money matters’). By contrast, it grew by just 35% for full-time male earners in the United States and by only 18% for US households.”

Full story with graphics at <https://goo.gl/DLf7yq>.



SAVE THE DATE! APRIL 26 - 27, 2018

AUA 65th Annual Meeting

Hyatt Regency Chicago, Chicago, Illinois

Hosted by Northwestern University Feinberg School of Medicine
and University of Chicago School of Medicine



AUA

Association of University Anesthesiologists

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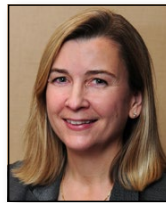
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