AUA
Association of University Anesthesiologists
Update
Spring 2015

CONTENTS

An Academic Home for Developing Scholars in Anesthesiology

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Relatively recently, the American Association of Physicians and the American Society for Clinical Investigation (AAP/ASCI - internal medicine academic honorific societies) established a society for younger individuals who are currently in research training positions: the American Physician Scientists Association (APSA).[1] This organization is devoted to addressing the needs of physician-scientist trainees. Currently there is no analogous academic home for rising scholars in Anesthesiology (Figure 1), leaving a potential career vacuum. To fill this gap, the AUA Council of the Association of University Anesthesiologists (AUA) has endorsed a plan to help establish a venue for young scientists in our field to share ideas, present their research and receive mentorship and guidance. Such an initiative could make a substantial contribution to the future of academic anesthesiology.

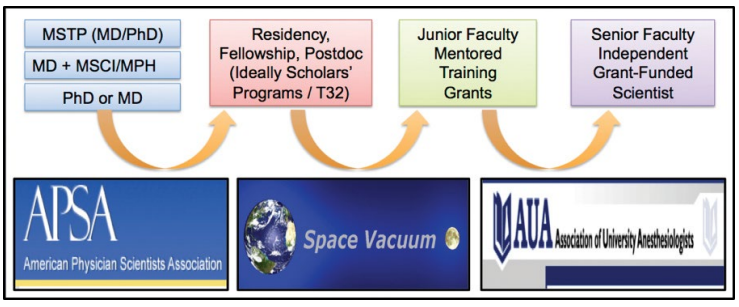

Figure 1: Space Vacuum - Lack of an Academic Home for Rising Scientists in Anesthesiology

Opportunity Knocks

In recent years, there has been a proliferation of resident research training programs in anesthesiology residencies, which have attracted numerous talented physician scientists to our specialty. Many gifted medical students are viewing anesthesiology and our expanding subspecialty branches as a viable route to meet their career aspirations. Harnessing the energy of these rising scholars and ensuring that they have appropriate mentorship is key to ensuring that they remain academically engaged. This engagement is essential to the continued academic vibrancy of our specialty. The evidence suggests that the majority of physicians with formal research backgrounds pursue academic careers with a strong research emphasis.[2] It is important that we ensure that those choosing anesthesiology are provided nurturance and opportunity to realize their academic potential.[3] Such an initiative in anesthesiology would demonstrate the commitment of our specialty broadly to our junior scientists, and would help to maintain the pipeline of scientists entering the specialty and contribute meaningfully to their success.[4] The AUA could provide the natural home for these aspiring clinician scientists, and their active involvement in the AUA would provide renewed focus and energy to our organization.

One of the most important functions of our honorific academic association is to ensure that we can cultivate a new generation of vigorous, committed, scientifically trained individuals. As stated by Schwinn and Balser, "The foundation for physician scientist leadership in the subspecialty of

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anesthesiology is highly dependent on the success of young investigators as they develop independent careers involving basic and clinical investigation."[5] In order to provide such individuals, who are currently in training or in their early years as faculty, with a forum to meet with their peers and also to share the excitement of discovery with other anesthesiology investigators, the AUA Council has set up a taskforce (the authors of this article) to help establish a similar organization to the one created by the AAP/ASCI under the auspices of the AUA. The purpose of this organization will broadly be to create a forum for physician anesthesiology investigators in training and to link these individuals at an early stage in their careers to the broader anesthesiology investigator community. However, it is important to emphasize that the specific flavor and character of the proposed organization will be defined organically by its own constituency and leadership. By helping to create such a group as an extension of the AUA, we would help to broaden the scientific participation in the AUA scientific sessions, infuse young blood into the meeting and hopefully provide the stimulus to encourage these promising young investigators to remain and prosper in academic anesthesiology.

"The current cadre of graduates from anesthesiology programs is the most talented and highly trained that we have seen in many years."

An Academic Haven

This organization could provide a home for aspiring academic anesthesiologists during training or even during their early years as faculty. Those in mentored training programs, including NIH sponsored T32 programs and those with K-type awards would specifically be invited to participate. The planned APSA-like organization could also attract those in medical scientist training programs or other academic tracks with a potential interest in anesthesiology. We believe that it would add to the vibrancy of the AUA if members of the planned organization were to attend AUA meetings and if there were special sessions for these junior colleagues. We envision that this organization would both participate in the scientific sessions of the AUA and run their own sessions as part of the AUA Annual Meeting. The AUA Council and this taskforce would provide resources and direction to ensure that the nascent organization enjoys a successful launch, but the organization of APSA-inspired body would subsequently be run by the members themselves, with ongoing organizational support from the AUA. Such an organization would help to grow the future leaders of our specialty.

The Next Steps

Directors of all anesthesiology T32 programs in the country have responded positively regarding the suggestion to develop a consortium and apply to the NIH for funding for a meeting, which would include all the T32 scholars and other academic trainees in the specialty. The AUA taskforce is reaching out to current T32 scholars to help in conceptualizing and launching this exciting organization. An expanded taskforce including scholars will be established and will meet at the International Anesthesia Research Society (IARS) 2015 Annual Meeting and International Science Symposium in Hawaii and the AUA 62nd Annual Meeting in Nashville. This initiative will be promoted at next year's Foundation for Anesthesiology Education and Research session at the ASA Annual Meeting. The editors of the major anesthesiology journals have also indicated their support and willingness to publicize this venture. The current plan is to hold the inaugural meeting of this ASAP-inspired anesthesiology group in association with the 2016 AUA/IARS meeting in San Francisco. The specific content of the meeting will be determined by the expanded taskforce, but likely themes include innovation in anesthesiology, mentorship, diversity in academia, ethics and fraud in research, and novel funding opportunities. Participants will have the opportunity to present research findings, and discuss and share research ideas. It is probable that there will be travel awards and research prizes. Residency program directors and T32 program directors will be available to attendees to provide feedback and career guidance.

Conclusion

As academic anesthesiologists, we find ourselves at an important juncture where the academic future and character of our specialty are indeterminate. The current cadre of graduates from anesthesiology programs is the most talented and highly trained that we have seen in many years. The time is ripe for the creation of an association for the next generation of academic anesthesiologists. Such an initiative could have a rejuvenating impact on our field and would provide a nurturing environment for rising academics in anesthesiology.

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Scientific Advisory Board Report: Persistent Post-Operative Pain: A Central Sensitivity Syndrome?

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Introduction

According to the Institute of Medicine Report on Chronic Pain in America, common chronic pain conditions affect at least 116 million U.S. adults at a cost of $560–635 billion annually in direct medical treatment costs and lost productivity.[1] The IOM Report further concluded that "chronic pain has a distinct pathology, causing changes throughout the nervous system that often worsen over time." We know that chronic pain has significant psychological and cognitive impact and represents a serious, discrete disease entity. Importantly, experience tells us that individuals suffering from one form of chronic pain often have other chronic pain conditions; and are more likely to also have mood disorders, disrupted sleep, decreased energy, difficulty concentrating, and report an overall decrease in their enjoyment of life. Therefore, chronic pain impacts biological, psychological, and social factors and optimally involves multidisciplinary approaches for prevention and management. Moreover, based on current knowledge, early intervention is of paramount importance in preventing or minimizing the impact of persistent pain, chronic pain after surgery. This review will offer an update from the anesthesiologists' perspective on persistent post-op pain, where we have the unique opportunity to collaborate with our colleagues during the perioperative period to exert "an ounce of prevention" that may be worth "pounds of cure".

Pathophysiology of Chronic Pain

Often acute pain after tissue injury and nerve injury is followed by chronic pain.[2,3] The natural history of the acute-to-chronic pain transition likely depends on the specific underlying pathophysiology, and these mechanisms are under intensive study.[4-8] Maladaptive neuroplastic changes in the peripheral (PNS) and central nervous system (CNS) are believed to be critical to the complex pathophysiology of chronic pain.[2,9] These changes include Peripheral Sensitization that occurs with tissue damage and is associated with increased spontaneous firing of sensory nerves related to an upregulation in transduction, conduction or nociceptor sensitivity.[2] Tissue damage causes nociceptor and microglial (inflammatory cells of the nervous system) activation producing alterations in gene expression and receptor and channel density, leading to nociceptor hyperexcitability.[2,10,11] Central Sensitization is thought to occur with persistent stimulation of nociceptors leading to activation of higher order neurons associated with synaptic changes including ion channels, receptors, neurotransmitters, and N-methyl-D-aspartate (NMDA)-dependent mechanisms.[2,9,12] Additional important alterations include imbalances in excitatory, inhibitory, and modulatory circuits that converge in the spinal dorsal horn, leading to deficiency of descending inhibitory modulation.[9,13] Longer duration pain can affect higher centers that are involved in processing and modulation of pain producing increased gray matter in the posterior cingulate, hippocampus, midbrain, and cerebellum.[14] These changes enable subthreshold stimuli and spontaneous activation of second order neurons in the absence of continued nociceptor activation, and are associated with expansion of receptive fields (secondary hyperalgesia)[15,16]. These altered sensory processes can be detected by functional imaging,[17] and quantitative sensory testing using experimental pain protocols.[15,17]

Notably, the development of chronic pain after various forms of nerve injury is highly variable and despite similar triggers (i.e., high risk surgical procedures, diabetes, MS, stroke, etc.) only some individuals will develop a persistent pain syndrome.[2,3] Some forms of chronic pain may develop after a trigger but may be delayed (i.e., neonatal nerve injury, CRPS).[18] Still other forms of chronic pain may have triggers that are more obscure and therefore more difficult to understand and study, especially when related to chronic metabolic, neurodegenerative or inflammatory disorders (i.e., diabetes, multiple sclerosis, etc.). Probably the most perplexing are the numerous "somatic" pain disorders that occur despite the lack of an apparent triggers, and there are few if any peripheral pathologic findings to explain associated chronic pain. From the authors' perspective, with known nerve injuries on one-end of the spectrum, and abstruse triggers on the other end associated with somatic disorders, the latter may be most informative with regard to a common fundamental mechanism of susceptibility, but the former much easier to study. Nonetheless, there is significant overlap in these conditions to suggest that even persistent post-op pain may arise from common shared mechanisms of suceptibility. The basis for

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this opinion arises from numerous observations reviewed herein suggesting an underlying predisposition, shared risk factors and mutual benefit from selected therapeutics used to treat both somatic disorders and persistent post-operative pain.

Persistent Post-Operative (Post-Op) Pain

It is estimated that persistent post-op pain as defined by Kehlet et al., (2006) occurs in up to 50% of cases after common surgical procedures, and pain may be severe in up to 10% of cases.[3] Risk factors include prior persistent preoperative pain [19-21] age, gender, anxiety, the type of surgery, the adequacy of post-op analgesia and genetic background.[3,9] With regard to manageable endpoints for the anesthesiologist, increased acute postop pain intensity (severe persistent nociceptor stimulation) is a critical risk factor for the development of persistent post-op pain and represents the most important justification for early multimodal interventions.[21-25] Catastrophizing, or fear and pessimism about the surgical outcome during the preoperative exam, is also a potentially manageable endpoint and associated with increased acute post-op pain and persistent pain after surgery.[21,23,26] There is an inverse relationship with age,[27,28] and females appear to more likely then males to develop persistent pain, for unknown reasons.[23,26] Nerve damage associated with the type of procedure appears to be another critical factor in developing persistent pain after surgery. For example, open herniorraphy, breast cancer surgery, thoracotomy, and knee arthroplasty where major peripheral nerves may be injured are strongly associated with an increased risk of persistent pain.[24,25,27,29] Finally, genetics is a critical factor that may explain a substantial portion of the observed clinical variability, where despite a comparable environmental exposure (i.e., same surgical procedure) only a portion of the individuals exposed develop persistent postop pain.[30-35] This clinical variability despite similar environmental exposures is strong evidence for a significant heritable predisposition to persistent post-op pain.

Genetic and Environmental Factors Critical to Disease Susceptibility

Virtually all diseases arise from the interaction between genetic susceptibility and environmental factors. Not unexpectedly, co-morbid chronic pain syndromes, frequently associated with persistent post-op pain, are also impacted by a combination of environmental and genetic factors. Potential environmental triggers can include both peripheral and central injuries (i.e., surgical nerve injuries, TBI, SCI, and a variety of metabolic, infectious, and neurodegenerative illnesses) that affect a variety of neural structures. Some experts have suggested that stress and chemical exposure (alcohol, drugs, environmental toxins, etc.) can also contribute and the mechanisms of suscetpibility may even overlap with those important in chronic pain.[36]

Genetics are now believed to play an important role in determining clinical variability observed in nociception, pain processing, and therapeutic response.[2,32,37-40] These genetic factors likely represent a 'blueprint' for a predisposition to comorbid chronic pain syndromes including persistent post-op pain. Recently, a large twin study demonstrated shared genetic factors, causal in a number of comorbid chronic pain conditions, support common pathways of susceptibility.[41] These data strongly support an important role for genomic studies in identifying functional variants in genes and biologic pathways that are critical to disease susceptibility/resistance and these studies should lead to the discovery of preventive approaches and mechanism-based therapies. On the basis of what we know today, we hypothesize that functional DNA variants in genes and biologic pathways fundamental to persistent post-op pain susceptibility, will be shared with susceptibility to common comorbid pain conditions. We further theorize that these shared genetic susceptibility factors are likely associated with a 'central sensitivity syndrome', and the specific peripheral manifestations of a particular disease are due to additional distinct organ/tissue related genetic variants interacting with environmental triggers.

Evolving Concept: Central Sensitivity Syndrome

While there is an increasing recognition that a prototypical dysregulation of central neurocircutry is contributory to a range of chronic comorbid pain disorders, the mechanisms remain elusive. Recently, these comorbid disorders have been designated as "Central Sensitivity Syndromes" (CSS) or "overlapping pain syndromes".[41-46] CSS comprise a variety of "somatic" conditions and share symptoms of depression, fatigue, anxiety, and sleep disturbance that are frequently obsserved with other chronic pain conditions.[47] While these patients often suffer from multiple co-incident well-described chronic pain conditions, still others have evolving symptoms characterize by different complaints at different times that are not as easy to spot preoperatively. Some of the chronic comorbid pain syndromes linked with CSS are thought to include dry eye, burning mouth syndrome, fibromyalgia, irritable bowel syndrome, and other functional gastrointestinal disorders, interstitial cystitis, other chronic bladder pain syndromes, temporomandibular disorder, chronic fatigue syndrome, vulvodynia, tension headache, and myofascial pain syndromes.[14,43,48-61] Patients with these co-morbid conditions and with pre-existing chronic pain syndromes should be a red flag for the anesthesiologist and surgeon regarding their higher risk for developing persistent post-op pain. Importantly, from the anesthesiologist's perspective, it is prudent to approach every patient as potentially 'susceptible' to developing persistent post-op pain. Minimizing preoperative stress and maximizing perioperative pain management, and avoiding nerve damage where possible, is of paramount importance. Intuitively, one can readily appreciate that perioperative studies during elective surgery, especially high-risk

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procedures, represent an ideal 'model' for mechanistic studies on susceptibility to the acute-to-chronic pain transition.

Is Persistent Pain After Surgery Due to a Central Sensitivity Syndrome?

Recent evidence suggests that pre-existing "central sensitivity" observed in pre-operative experimental pain testing (QST) may be fundamental to the development of chronic pain after surgery.[62,63] Further evidence shows from brain imaging studies that specific pain processing centers (e.g., prefrontal cortex, limbic systems, etc.) may be involved in this "predisposition" to persistent post-op pain.[64] Additional data suggest certain molecular pathways could also be involved, including central microglial activation by proinflammatory cytokines, altered decending inhibition, central dopamine and serotonin pathways.[11,42] As mentioned previously, known risk factors for persistent post-op pain incorporate many of those associated with somatic pain disorders and CSS (e.g., female gender, chronic pre-existing pain syndromes predict future pain, etc.) also consistent with a shared underlying mechanisms. Interestingly, the development of somatic complaints after surgery are also increased.[2,9] With regard to prevention or treatment, while overall the efficacy of most compounds used to treat CSS and peristent post-op pain are disappointing, recent clinical trials suggest some level of success with selected treatments.[9,65] Compounds beneficial to treat CSS and co-morbid pain conditions include tricyclic antidepressants (i.e., nortriptyline, amitriptyline, etc.); gabapentinoids (i.e., gabapentin and pregabalin); alpha adrenergic agonists; and serotonin and norepinephrine reuptake inhibitors (SNRIs). When used in the perioperative period, these compounds are generally believed to be beneficial for prevention of persistent post-op pain.[9,13] The utility of these selected pharmaceuticals in prevention and treatment of persistent post-op pain and CSS, further supports the concept of shared mechanisms of susceptibility for these disorders.

'Chronic Pain Futures': Prevention and Treatment

Prospective multidisciplinary clinical research is desperately needed to better understand the natural history of persistent post-op pain, co-morbid pain conditions, risk factors, and genetic mechanisms of susceptibility.[8] Unfortunately, prospective clinical research is difficult and costly to perform, especially when the disease trigger is obscure or may occur over extended timeframes. Persistent post-op pain after elective surgery represents a unique situation where we know precisely when the "trauma" will occur and we can use this to our advantage. Elective surgery provides an exceptional opportunity to prospectively study the acute-to-chronic pain transition, the impact of a pre-existing CSS, and the development of persistent post-op pain before and after a well-controlled environmental surgical trigger. Assuming CSS is an important risk factor for persistent post-op pain, studies during the perioperative period and afterward can be used to dissect the mechanisms of genetic susceptibility essential to disease development, prevention, and therapeutic innovation.

Summary

Dysfunctional neuroplasticity in central pain pathways is likely crucial to the development of complex chronic symptoms associated with CSS and are likely important in persistent post-op pain.[1,2,43,65,66] Useful strategies for the anesthesiologist and surgeon currently include understanding how to recognize high risk patients and utilize available multimodal approaches as a means to prevent persistent post-op pain development. Future success in this field will depend on well controlled and adequately powered clinical studies to understand the natural history of these disorders. For CSS, these studies are costly and complicated by the chronic and sometimes abstruse nature of symptom development and progression.[18] Moreover, direct study of the diseased tissues is limited in living subjects. Nonetheless, new noninvasive techniques such as fMRI may aid our understanding of what pain processing pathways are involved and more about the relationship between CNS pathology and symptoms progression. Pharmacologic fMRI (phFMRI) may also aid directed drug development targeting affected tissues.[67] In contrast to CSS, understanding persistent post-op pain may be more realistic. Especially, persistent post-op pain associated with elective surgery, which provides a exceptional opportunity to facilitate well-controlled epidemiologic studies and clinical trials with new agents in conjunction with pharmacogenomic studies on treatment response. Genetic studies using unbiased approaches, such as genome-wide association techniques, exome arrays, and sequencing hold great promise for identifying the functional DNA variants, genes, and molecular pathways of susceptibility/resistance to these co-morbid disorders. These approaches are likely to empower the development of highly effective preventive strategies and future mechanism-based treatments for causal factors shared between CSS and peristent post-op pain. Ultimately, these combined approaches should provide valuable insights for the anesthesiologist and surgeon to facilitate individualized care that has the potential to transform the field of chronic pain.

Acknowledgements

Supported by the Department of Veterans Affairs, Veterans Health Administration, Office of Research and Development, Clinical Sciences Research and Development's Career Development Award CDA-2-024-10S (Dr. Galor), NIH Center Core Grant P30EY014801, Research to Prevent Blindness Unrestricted Grant, Department of Defense (DOD-Grant#W81XWH-09-1-0675 and Grant# W81XWH-13-1-0048 ONOVA) (institutional); NIH NIDCR RO1 DE022903 (Drs. Levitt and Martin), and the Department of Anesthesiology, Perioperative Medicine, and Pain Management, University of Miami Miller School of Medicine, Miami, FL for funding.

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Conflict of Interest

The authors have no financial interest in any materials or methods described within this article.

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Imperatives for the Future of Anesthesiology — A Perspective from FAER

Denham S. Ward, MD, PhD
President and CEO
Foundation for Anesthesia Education and Research (FAER)
Rochester, Minnesota

With all of the exciting changes ahead for FAER this year, there is one point I want to emphasize: As we embrace changes on the road ahead, we remain committed to our mission to advance medicine through anesthesia education and research and to our core work of providing research grant funding, career development resources and opportunities to aspiring physician investigators and educators.

Commitment to Community of Supporters

As many of you may have heard by now, this summer FAER's office will relocate from Rochester, Minnesota to the American Society of Anesthesiologists headquarters in Schaumburg, Illinois FAER is co-locating at the ASA headquarters based on the recommendation of the ASA Board of Directors and the FAER Executive Committee. This move will be complete by July 1, 2015.

Co-location will create efficiencies that will help FAER better serve the anesthesiology community, and in turn, allow us to dedicate more resources to research grant funding. FAER will continue to advance medicine through research and education by funding the best research being done by young investigators. We will also continue to focus on the discovery of new knowledge that will improve the practice of anesthesiology and the education of the next generation in the specialty.

"FAER remains committed to its supporters and donors, whose wishes and intentions will continue to be honored by FAER as they have in the past."

Furthermore and of utmost importance, there are many in the academic anesthesiology community who support FAER philanthropically. Your charitable support ensures that the future of medicine sees as much progress as the past. We are grateful for this. Through this transition, **FAER remains committed to its supporters and donors, whose wishes and intentions will continue to be honored by FAER as they have in the past.** FAER is a separate but related organization to the ASA. We are a 501(c)3 non-profit. Any donations made to FAER or designated to FAER will remain with FAER and used to support the grants, career development opportunities and educational activities that FAER provides.

"Mentoring has always played an important role in my career, and leading FAER has allowed me to help in the mentoring process of the many young people who have been supported by FAER in some way. The nurturing of new careers in anesthesiology investigation is the most important advocacy we can make for our profession."

Second Grant Funding Cycle

As part of the process to encourage more applications for FAER grants, for the first time since 2008, we are offering a second grant funding cycle in 2015. The deadline for the first application cycle was February 15. The FAER Board of Directors will make funding decisions at its spring meeting, which will be held in conjunction with the AUA annual meeting in Nashville.

The deadline for the second cycle is August 15. By providing a second opportunity to apply for funding, FAER aims to receive additional meritorious applications of which to award funding, in turn increasing the amount of extramurally funded research activity in anesthesiology. The FAER board has also committed funds from its reserves to fund both grant cycles. We anticipate that in 2015, we will be committing even more funding than the $2.5 million we committed in 2014. For more information and details on how to apply, visit **FAER.org/research-grants**.

Leadership Transition

Finally and perhaps the most important for me personally, is my decision not to serve a second five-year term as FAER's president and CEO. This has been an amazing experience to have led FAER. Combined with my service on the board, I have been closely connected to FAER for almost 15 years.

Mentoring has always played an important role in my career, and leading FAER has allowed me to help in the mentoring process of the many young people who have been supported by FAER in some way. The nurturing of new careers in anesthesiology investigation is the most important advocacy we can make for our profession.

Jim Zaidan, MD, MBA, past chair of FAER's Board of Directors and chair of the FAER Nominating Committee, will be leading the search committee for the next president and CEO. I am sure that FAER will attract the leadership it needs to help guide it, and the specialty, well into the future. For details about the position and candidate search, visit **FAER.org/president**.

AUA: Important News for AUA Members!

Plan to Attend the AUA Annual Business Meeting on April 24 in Nashville

AUA Members will have the opportunity to vote on nominees for membership, candidates for the open AUA Councilor-at-Large position, and proposed bylaws amendments to the AUA Council during the Annual Business Meeting, Friday, April 24, 2015, held during the AUA 62nd Annual Meeting, April 23-25, 2015, at the Loews Vanderbilt Hotel in Nashville, Tennessee. Plan to attend the AUA Annual Business Meeting and cast your vote!

The items up for a vote at the AUA Annual Business Meeting are outlined below.

AUA Proposed Bylaws Amendments

The AUA Council are proposing the following amendments to the AUA bylaws for a vote by AUA members present at the Annual Business Meeting.

- The Council is recommending that nominations be accepted twice per year with a more simplified nomination process. The nomination process will be outlined in the administrative procedures document approved by the AUA Council.
- Recognizing the reliability of electronic communications, the Council is recommending that voting be conducted via electronic communication involving all members rather than a paper ballot at the Annual Business Meeting. This would allow for a more inclusive voting process. Members would be able to vote by mailed ballot by request.
- The Council is recommending the creation of a new membership type, Associate Member, for individuals earlier in their career with all the privileges of membership except voting or holding office. This new membership type would allow for individuals earlier in their careers without the level of experience required of an Active Member to be involved in the AUA. It would also offer an opportunity to eventually transition into an Active Member role once completing the experience necessary.

To review the proposed amendments to the AUA bylaws, click here. (http://bit.ly/1MMqhZW)

AUA Nominating Committee Announces 2015 Candidates

The AUA Nominating Committee is pleased to announce the two Councilor-at-Large candidates presented for election to the AUA Council for 2015.

AUA members will vote to elect one (1) Councilor-at-Large for a 3-year term during the AUA Annual Business Meeting.

The Councilor-at-Large candidates include:

Alex Bekker, MD, PhD

Aman Mahajan, MD, PhD

To learn more about the candidates for Councilor-at-Large, please view the candidates' statements here. (http://bit.ly/1xhBQ8l)

AUA Member Nominations for 2015

The AUA Council will review all nomination applications in conjunction with all supporting materials, including member comments, and will recommend qualified nominees for election to the membership at the AUA Annual Business Meeting.

To view the list of AUA member nominees for 2015, click here. (http://bit.ly/1GTsnEb)

Register for the AUA 62nd Annual Meeting Today and Vote at the AUA Annual Business Meeting in Nashville!

For more information, visit www.auahq.org, or register at http://auahq.org/aua-annual-meeting.

The Association of American Medical Colleges (AAMC) has published a report, "The State of Women in Academic Medicine: The Pipeline and Pathways to Leadership 2013-2014," that offers detailed statistics and findings on women throughout academic medicine — from learner and faculty ranks through the pipeline to leadership. The publication is free to all and available as a downloadable PDF. **Click here** to read more.

Final Program

AUA 62nd Annual Meeting
April 23–25, 2015

Loews Vanderbilt Hotel

Nashville, Tennessee

hosted by

Vanderbilt University School of Medicine

AUA
Association of University Anesthesiologists

VANDERBILT UNIVERSITY

AUA 62nd Annual Meeting Program Schedule

Thursday, April 23, 2015	
10:00 am – 8:00 pm	**Registration**
12:30 pm – 12:45 pm	**Introduction and Welcome to the AUA 62nd Annual Meeting** Thomas J. J. Blanck, MD, PhD
12:45 pm – 1:00 pm	**Introduction and Welcome to the Host Program and Nashville** Warren S. Sandberg, MD, PhD
1:00 pm – 1:05 pm	**Introduction and Welcome to SAB Program** Charles W. Emala, MD
1:05 pm – 2:00 pm **Junior Faculty Research Award**	**SAB Oral Session (Part 1)** ***Pediatric Delirium in Critically Ill Infants and Preschool-aged Children: Validation and Reliability of the PreSchool Confusion Assessment Method for the Intensive Care Unit (psCAM-ICU)*** Heidi A.B. Smith, MD, MSCi, Vanderbilt University, Nashville, Tennessee ***Latent Class Analysis of Neuropsychological Deficit after Exposure to Anesthesia in Early Childhood*** Caleb Ing, MD, MS, Columbia University, New York, New York **Margaret Wood Resident Research Award** ***The Relative Effects of Dexmedetomidine and Propofol on Cerebral Blood Flow and Brain Oxygenation: A Noninferiority Study*** Michael Kot, MD, Cleveland Clinic, Cleveland, Ohio ***The Elderly Brain Under Anesthesia: An Age-Dependent Analysis of Propofol – and Sevoflurane-Induced Electroencephalogram Dynamics*** Patrick L. Purdon, PhD, Massachusetts General Hospital, Boston, Massachusetts
2:00 pm – 2:15 pm	**Coffee Break & Poster Viewing and Discussion**
2:15 pm – 3:15 pm	**SAB Oral Session (Part 1) Continued** ***Selective Inhibition of the Calcineurin Interaction Site of TRPV1 Reduces Myocardial Infarct Size by Reducing Mitochondrial Calcium Influx*** Eric R. Gross, MD, PhD, Stanford University, Stanford, California ***Proteomic Profiling and Multi-Color Flow Cytometry Reveal Species Specific and Hibernation-State Specific Differences in Innate Immunity, Susceptibility to Injury, and Response to Surgical Ischemia-Reperfusion between Rats and Arctic Ground Squirrels*** Quintin J. Quinones, MD, PhD, Duke University, Durham, North Carolina ***Extracellular RNA Induces Inflammation via Toll-Like Receptor 7 and Contributes to Myocardial Infarction in a Mouse Model of Ischemia-Reperfusion Injury*** Wei Chao, MD, PhD, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts ***Acute Ischemic Albuminuria Mediates AKI in Mice after Cardiac Arrest and Cardiopulmonary Resuscitation*** Michael P. Hutchens, MD, MA, Oregon Health & Science University, Portland, Oregon
3:15 pm – 4:45 pm	**Moderated Poster Discussion Session**
4:30 pm – 6:00 pm	**Resident Meet and Greet Reception**
5:00 pm – 8:00 pm	**Registration**
6:00 pm – 8:00 pm	**All Attendee Welcome Reception**

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AUA 62nd Annual Meeting Program Schedule, continued

Friday, April 24, 2015	
6:30 am – 6:00 pm	**Registration**
7:00 am – 8:00 am	**Continental Breakfast**
8:00 am – 8:10 am	**Introduction and Welcome to the EAB Program** Robert R. Gaiser, MD
8:10 am – 9:30 am	**EAB Program Session (Part 1): *State of the Art for Research in Education*** • **Review of the Key Literature in Anesthesia** David J. Murray, MD • **Conducting Quality Research in Education** Matthew McEvoy, MD • **An Editor's Perspective of Research in Education** Steven Shafer, MD **Question & Answer**
9:30 am – 10:00 am	**Coffee Break & Poster Viewing and Discussion**
10:00 am – 12:00 pm	**EAB Program Session (Part 2): *Measuring Knowledge in Anesthesia*** • **The Science of Psychometrics** Ann Harman, PhD • **Use of the OSCE to Measure Anesthesia Knowledge** Brenda A. Bucklin, MD • **Changes in the Exam Process to Measure Anesthesia Knowledge** James P. Rathmell, MD
12:00 pm – 1:00 pm	**EAB Luncheon**
12:00 pm – 1:00 pm	**SAB Luncheon**
12:00 pm – 1:00 pm	**President's Luncheon**
12:00 pm – 1:00 pm	**All Attendee Luncheon**
1:00 pm – 3:00 pm	**Mini-Symposium: *Peri-operative Genomics***
1:00 pm – 1:05 pm	**Introduction** Moderator: Peter Nagele, MD
1:05 pm – 1:25 pm	***Personalizing Health in the Academic Medical Center*** Jeff Balser, MD, PhD
1:25 pm – 2:00 pm	***Engineering a Healthcare System for Discovery and Implementation in Personalized Medicine*** Dan Roden, MD
2:00 pm – 2:20 pm	***Genomic Technology is Outpacing Utility This Decade, but Perhaps Not Next Decade*** Simon Body, MB ChB, MPH
2:20 pm – 2:40 pm	***Genomics and Opioid Pharmacology*** Evan Kharasch, MD, PhD
2:45 pm – 3:00 pm	**Moderated Panel Discussion** Moderator: Peter Nagele, MD
3:00 pm – 3:15 pm	**Coffee Break & Poster Viewing and Discussion**
3:15 pm – 5:15 pm	**President's Panel: Frontiers in Medicine – Genomes to Organizations** • ***Promoting Professional Accountability: Dealing with Behaviors that Undermine a Culture of Safety and Reliability*** Gerald B. Hickson, MD • ***Genomes, Phenomes, And Personalized Medicine: The Promise Of Genomic Medicine In EHRS*** Joshua C. Denny, MD, MS
5:15 pm – 6:15 pm	**AUA Annual Business Meeting**
6:15 pm –	**Free Night to Explore Nashville**

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AUA 62nd Annual Meeting Program Schedule, continued

Saturday, April 25, 2015	
6:30 am – 5:00 pm	**Registration**
7:00 am – 8:00 am	**Continental Breakfast**
8:00 am - 8:05 am	**Introduction to the SAB Oral Session (Part 2)**
8:05 am – 9:00 am **Junior Faculty Research Award**	**SAB Oral Session (Part 2)** ***Isoflurane Disrupts the Development of Dendrites in the Mouse Hippocampus via Activation of the mTOR Pathway*** Cyrus D. Mintz, MD, PhD, Johns Hopkins University School of Medicine, Baltimore, Maryland ***Carbon Monoxide Modulates Cytochrome Oxidase Activity and Oxidative Stress in the Developing Murine Brain During Isoflurane Exposure*** Richard J. Levy, MD, FAAP, Columbia University Medical Center, New York, New York ***Astrocyte Specific Knockout of Hypoxia-Inducible Factor Impairs Hippocampal Learning after Mild Hypoxia*** Cindy V. Leiton, PhD, Stony Brook University, Stony Brook, New York ***Maresin 1 Prevents Neuroinflammation in a Mouse Model of Postoperative Cognitive Decline*** Niccolo Terrando, BSc (hons), DIC, PhD, Karolinska Institutet, Stockholm, Sweden
9:00 am – 9:15 am	**Coffee Break**
9:15 am – 10:15 am **Resident Travel Award**	**SAB Oral Session (Part 2) Continued** ***Dexmedetomidine's Inhibitory Effects on Acetylcholine Release from Cholinergic Nerves in Guinea Pig Trachea: A Mechanism That Accounts for its Clinical Benefit during Airway Irritation*** Maya Mikami, MD, PhD, Columbia University College of Physicians and Surgeons, New York, New York ***Effects of Race and Common Genetic Variation on Therapeutic Response Disparities in Postoperative Atrial Fibrillation*** Nazish K. Hashmi, MB, BS, Duke University Medical Center, Durham, North Carolina ***Do Potent Anesthetics Bind to All Five Transmembrane Subunit Interfaces in GABAA Receptors?*** Stuart A. Forman, MD, PhD, Massachusetts General Hospital, Boston, Massachusetts ***Selective Pharmacologic Targeting of the GABA-A α4 Subunit in Airway Smooth Muscle to Alleviate Bronchospasm*** Gene T. Yocum, MD, Columbia University, New York, New York
10:15 am – 11:45 am	**Moderated Poster Discussion Session**
11:45 am – 12:45 pm	**All Attendee Luncheon**
11:45 am – 12:45 pm	**Resident Luncheon** *Tables will be reserved for residents, fellows and their sponsoring chair. Members of the AUA Council will be present to meet with these future academic anesthesiology leaders.*
12:45 pm – 1:45 pm	**Host Program Session (Part 1)** ***Earth 2.0: The Quest for Other Worlds and The Diverse Scientists Who Find Them*** Keivan Stassan, PhD
1:45 pm – 2:45 pm	**Host Program Session (Part 1)** ***Comparative Neurobiology: What We Can Learn from the Adaptations of Interesting Predators*** Kenneth Catania, PhD
2:45 pm – 3:00 pm	**Coffee Break**
3:00 pm – 4:00 pm	**Host Program Session (Part 2)** ***What's A Guy Got to Do to Get A Meal Around Here? Vectors, Parasites and Homeostasis in Tropical Diseases*** David W. Wright, PhD
4:00 pm – 5:00 pm	**Host Program Session (Part 2)** ***You Either Believe in Magic or You Believe in Math: The Changing Economics and Regulation of Health Care*** R. Lawrence Van Horn, PhD, MPH, MBA
6:00 pm – 10:00 pm	**Social Event Reception & Dinner** *Country Music Hall of Fame® and Museum* *Reception: 6:00 pm – 7:00 pm* *Dinner: 7:00 pm – 10:00 pm* *Museum access will be available to attendees during the reception.*

Educational Advisory Board Report: The Graduate Medical Educational Journey: Using Milestones to Mark the Way

Scott A. Schartel, DO
Professor and Associate Chair for Education Residency;
Program Director, Department of Anesthesiology, Temple University

Disclosure: I was a member of the Anesthesiology Milestones Work Group. The opinions expressed in this article are those of the author alone and do not represent those of the ACGME, ABA, or any other organization.

In its most literal definition, a milestone is a roadside marker indicating distance on a journey. The Oxford English Dictionary also provides a figurative definition: "[a] significant stage or event in the progress or development of a society, a career, an individual's physical and mental growth, etc.; a measure of progress or change." It is in this sense that milestones can be used to monitor progress on the educational journey of medical students and residents.

The organization of graduate medical education at the beginning of the 21st Century still follows a pattern that was established at the Johns Hopkins Hospital by William Osler and William Halstead at the end of the 19th Century. It remains, in many respects, an apprenticeship model, where medical students and residents (apprentices) work with qualified physicians (masters) for a defined period of time to achieve the skills necessary to practice independently. What have changed over the past century have been the paradigms that are used to organize and monitor a learner's success.

For much of the 20th Century, accreditation of graduate medical education programs was based on how well programs conformed to the rules established by accrediting bodies. Since 1981, the Accreditation Council for Graduate Medical Education (ACGME) has been the principal accrediting body for graduate medical education in the United States. Accreditation was based on establishing that residency programs conformed to the training standards that had been published by the various Residency Review Committees. Conformity to these rules was used as a surrogate marker for programs achieving the desired educational result — the graduation of competent physicians. While this approach led to more uniformity in residency training across different programs, ensuring that all programs met the same minimum standards, it did not explicitly ensure that all graduates met the expected level of performance.

In the final decades of the last century, there was increasing concern about the quality of health care, including concern about the competence of physicians. In 1999, the Institute of Medicine published a report, To Err is Human: Building a Safer Health System. This report focused attention on patient safety and the quality of health care, including the quality of those who delivered it. Within the medical educational community there was a paradigm shift focusing attention on defining and measuring educational outcomes, rather than relying primarily on educational processes (e.g., structural organization, policies) to ensure the graduation of competent physicians.

In the United States, this shift began with the ACMGE's Outcomes Project. The Outcomes Project described six domains that were used to characterize a competent physician. These domains, the six general competencies, are patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice.

This shift to competency-based medical education was not unique to the United States. Examples of the approach used in other countries are the CanMEDS Framework developed by the Royal College of Physicians and Surgeons of Canada, and the Scottish Doctor Project developed by a consortium of Scottish medical schools. The CanMEDS Framework uses a diagram with seven overlapping roles to characterize a good doctor. At the center of the diagram is medical expert. The other six roles are communicator, collaborator, manager, health advocate, scholar, and professional. The Scottish Doctor Project identified twelve domains and three outcomes to describe a competent physician. The outcomes are shown as three concentric circles. "The doctor's technical skills or 'what the doctor is able to do' (the inner circle) is considered in the perspective of 'how they approach their practice' (middle circle) and 'their personal development' as a professional (the outer circle)."

> *"While the Outcomes Project succeeded in reframing the discussion of graduate medical education, the first decade did not result in the desired endpoints."*

With the implementation of the ACGME's Outcomes Project, residency programs were required to refocus their educational activities around the general competencies and were expected to develop evaluation tools to ensure that graduates achieved the desired outcomes. Programs were encouraged to experiment with methods to teach and evaluate the desired outcomes. While the Outcomes Project succeeded in reframing the discussion of graduate medical education, the first decade did not result

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in the desired endpoints. In 2007, Susan Swing stated: "… increased emphasis on the use of outcome data in accreditation has not occurred yet. Further development and implementation of assessment tools and electronic data collection systems will be needed before this change can occur and before the effects of competency-based education on resident performance can be evaluated."

In recognition of the limitations of the initial phases of the Outcomes Project, the ACGME revised and reframed the accreditation process for graduate medical education leading to the "next accreditation system". An integral part of this change was the development of educational milestones to assess progress of residents and fellows. A series of educational outcomes characterizing competent physicians within the various specialties were developed by working groups that included physicians nominated by the relevant residency review committees and the certifying boards.

The Anesthesiology Milestones Working Group has published a description of the process by which the milestones for anesthesiology were developed. Each general competency was further divided into subcompetencies that characterized the specialty. For each subcompetency, there are descriptions of expected performance at five progressive levels of achievement. The Level 4 descriptions are the characteristics expected for a physician who is ready to enter independent practice. While the subcompetencies are described as the milestones, it is more accurate to consider the descriptions characterizing progression in the subcompetencies as the milestones that measure achievement in the subcompetencies. For anesthesiology, there are milestones for twenty-five subcompetencies, with the largest single group being the ten associated with patient care.

> *" Within every residency program, there will be activities that residents are trusted to perform mostly independently (e.g., anesthesia machine check, room set-up, drug preparation, arterial catheterization)."*

Specialties in the first phase of the new accreditation system began milestones assessment in 2013. Anesthesiology was in the second phase and reported milestones data for the first time in December 2014. Because of the way anesthesiology residents and fellows are supervised, many milestones lend themselves to assessment by direct observation. However, this is not the case for all milestones. The biggest challenge for residency and fellowship programs will be developing valid and reliable assessment tools to measure milestones that are not easily assessed by direct observation in the clinical environment. Not every resident or fellow may encounter some of the circumstances that characterize the higher level of performance.

For infrequently occurring clinical events, simulation-based assessment can be used to allow residents and fellows to demonstrate performance. While simulation is often thought of for assessing clinical and technical performance, it can also be used for assessment of non-clinical activities. The Level 4 milestones description for Systems-based Practice 2: Patient Safety and Quality Improvement includes "[p]articipates in formal analysis (e.g., root cause analysis, failure mode effect analysis) of medical error and sentinel events…" Many residents will not be involved in cases that require root cause analysis. However, simulation can provide a resident with the opportunity to demonstrate Level 4 achievement in this area. In incorporating simulation-based assessments into milestones evaluations, programs will need to decide which scenarios (e.g., malignant hyperthermia, anaphylaxis, venous air embolism, negotiating family conflicts) should be assessed and what level of performance will be deemed acceptable.

> *" While simulation is often thought of for assessing clinical and technical performance, it can also be used for assessment of non-clinical activities."*

Another assessment technique that may prove useful is the Objective Structured Clinical Exam (OSCE). The United States Medical Licensing Examination Step-2 clinical skills exam is an example of a high-stakes OSCE. The American Board of Anesthesiology has announced that it will incorporate an OSCE into the final stage of its certification process. Hastie and colleagues have published a review of the design and implementation of OSCEs in anesthesiology. Their paper provides a good starting point for those with limited experience in this technique.

As an example, an OSCE might be useful is in assessing Professionalism 2: Honesty, integrity, and ethical behavior states. Performance at Level 4 includes: "[d]evelops a systematic approach to managing ethical dilemmas in clinical care settings with conditional independence."8 While ethical challenges in anesthesiology are not rare, they are not so common that every resident will face a spectrum of ethical challenges. Development of a multistage OSCE, incorporating a variety of ethical challenges to navigate, could be used to allow a resident to demonstrate performance at this level. An oral or essay examination might also be used to assess this milestone.

The use of Entrustable Professional Activities (EPAs) is another way to structure a competency-based curriculum. This approach is used in the Netherlands. EPAs are components of physician responsibilities that faculty "entrust" to residents to perform independently. Like milestones, they represent goals to be mastered by the competent physician. In using EPAs,

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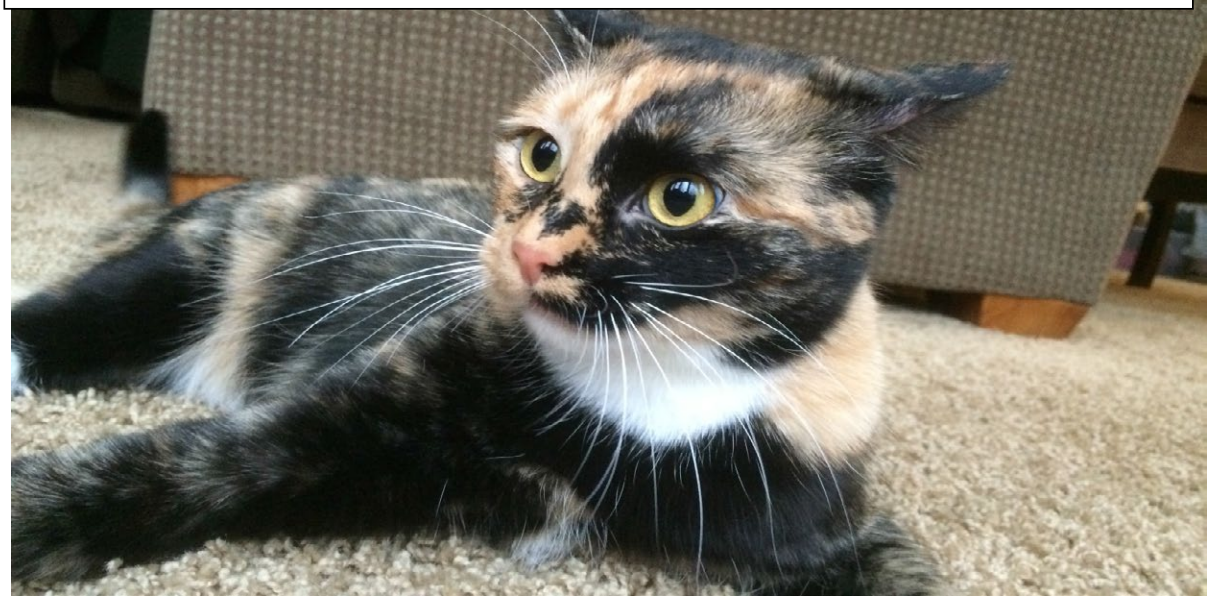
faculty identify the knowledge, skills, and attitudes needed to independently and competently perform the activity. Once a trainee has demonstrated achievement of the activity, it is noted in the trainee's record and the trainee is allowed to perform that activity independently. A Dutch medical educator, ten Cate, has written extensively on this topic. , , , In the U.S., a number of specialties have incorporated EPAs into their milestones. While EPAs were not included in the anesthesiology milestones, individual residencies may choose to add EPAs to their program. Within every residency program there will be activities that residents are trusted to perform mostly independently (e.g., anesthesia machine check, room set-up, drug preparation, arterial catheterization). Defining these activities and creating explicit pathways for "entrustment" is another way to incorporate outcomes-based assessment into residency education.

In a true competency-based educational model, graduation to independent practice would be based on achieving all the required educational outcomes. Time would not be a necessary factor—compared to the average trainees, some will achieve the goals more quickly, others more slowly — only the outcome would matter. In theory this seems to be a reasonable plan, but a move away from a time-based model has the potential to be very disruptive to managing medical education. While residents and fellows are learners, they are also an essential component of the delivery of health care in academic medical centers. The logistical challenge of managing a program with an unpredictable number of trainees is daunting. There is no requirement that this be an either-or proposition. It should be possible to create a model that incorporates both time and achievement. Residents who achieve the graduation-level milestones early could be offered additional advanced training opportunities within the residency program or could function in a less supervised role. Only time and careful study will tell if this shift in paradigm away from process and towards outcomes, including the incorporation of milestones assessments, will improve the quality of physicians and health care. For now, medical educators need to focus on implementing the changes necessary to successfully incorporate milestones assessments into residency and fellowship education.

Meet F∑L{Q46$*x!!



F∑L{Q46$*x!! is my brother's new cat. His old cat was named Kelly and when she first joined the family Kelly was his favorite password for all his applications. But alas, that long ago stopped working so, once Kelly passed on, now his new cat has a security acceptable name so he can again use his pet's name as his passwords and have no worries about remembering his passwords.

Member Focus: Joseph Gerald Reves, MD

Lisa Wise-Faberowski, MD
Stanford University
Stanford, California

The movie *Sweetgrass*, (**http://imdb.to/1B2wu01**) produced in 2003 is about a group of aged, stoic shepherds who take a group of sheep through the Beartooth Mountains of Montana for one last time. The movie portrays the trials and tribulations of their perilous journey. The herders are skilled and wise and have prepared for this journey several times, but each journey is different than the one before. Though they know some of the obstacles and are quite experienced, they must repeatedly face some of the many unknowns of the mountains and yet safely get all the sheep to their final destination.

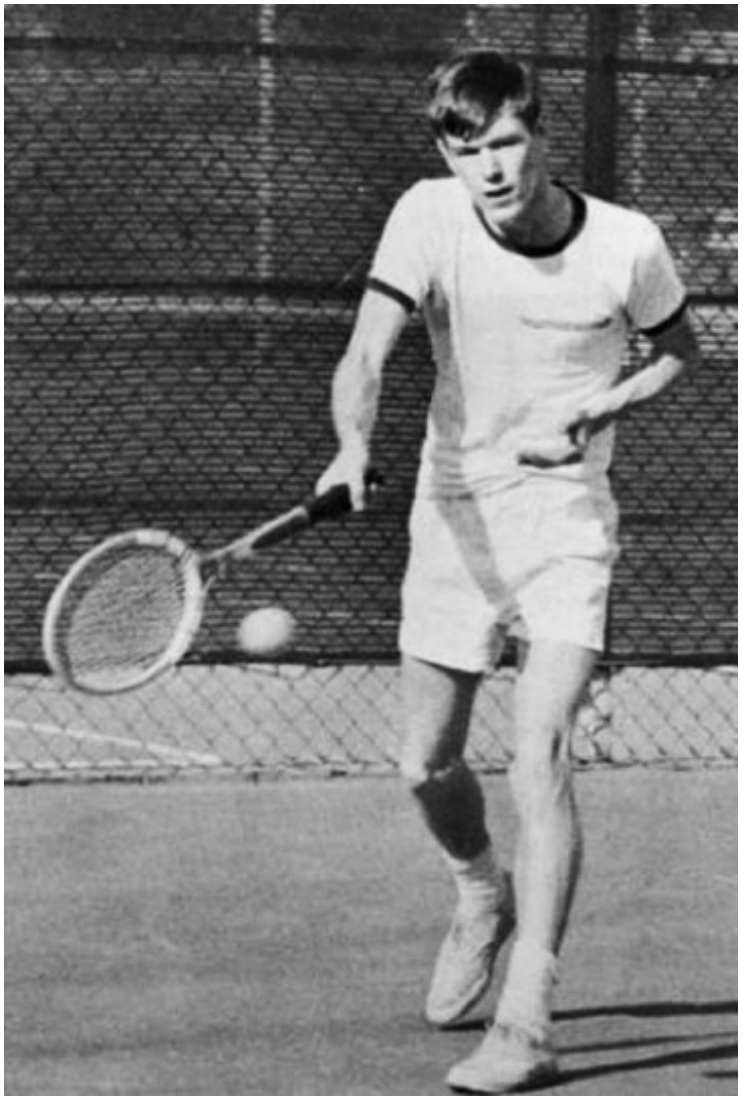
This commentary is so true of many of our leaders in anesthesiology. It is the altruistic leader who must selectively choose other individuals to bring the rest of his followers through the many obstacles that a career in anesthesiology may offer. Like the sheepherders, a leader in anesthesiology must have travelled the same path before, several times, in order to know the preparations that must be made ahead of time. It is the hope of the leader, that by the end of each journey, all the followers will make it to the end and that through the journey they will have learned not only more about themselves but also about the one leading them.

One such leader is Dr. Joseph Gerald Reves, known to many as Jerry Reves. Jerry was born in Charleston, South Carolina in 1943. He was the first and only child to the head of the math department at The Citadel and a psychiatric social worker at the county mental health clinic. Jerry was the perfect blend of the two. His mother gave him insight into the personal worth and value of individuals and his father was the role model for professionalism and altruism. Jerry has exemplified the human values, professionalism and altruism throughout his entire career. To honor his father, Jerry established the George E. Reves Award, in 1976, for superior ability and outstanding achievements in math or computer science.

Jerry spent all of his boyhood in Charleston. He attended Gaud, an all boys' school in Charleston and has always enjoyed the water. Jerry's career journey would take him from the waters of his South Carolina home, through several phases of his career and its many journeys, and then back again to his home in Charleston. Jerry stepped aside from his final "major" role in his journey, as Dean of the Medical School at the Medical University of South Carolina, at the age of 68, to begin a different journey in July of 2010 on his boat named appropriately enough *Sweetgrass.* The marine journey is named the "Great Loop."(**http://www.greatloop.com/**)

For Jerry, his career has made a "Great Loop." Like his father, he went to Vanderbilt University. At Vanderbilt, he began with a career headed not in medicine, but doing preliminary studies for law school. Most who know him would believe, he could withstand and state any argument. But most also know, he could only do this if it was something he truly believed in and considered of value to others. His altruistic, moralistic, supporter of human value-upbringing did not lend itself well to being a lawyer. Dr. Reves stands true to the value of physicians in serving mankind and the value of supporting others in truth and honesty.

As an individual who majored in English and Philosophy, Jerry returned to Charleston to do summer schooling at The Citadel, to obtain some of the necessary sciences for premed, but took most at Vanderbilt. One important thing Jerry received



He also continued with his passion for tennis and played on the Varsity tennis team at Vanderbilt … probably not too surprising given that Jerry's father was also the tennis coach at The Citadel.

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from Vanderbilt was computer training, something his father insisted upon, notwithstanding the novelty of that technology. He also continued with his passion for tennis and played on the Varsity Tennis Team at Vanderbilt … probably not too surprising given that Jerry's father was also the tennis coach at The Citadel.

Dr. Reves returned to Charleston and attended medical School at the Medical University of South Carolina (MUSC). It was here that Jerry met his wife, Jenny Cathcart, who was studying to be a medical technician. She, too, was a South Carolina native and her father was a former physician, who graduated from MUSC in 1943. Dr. Cathcart never saw his daughter marry, as he lost his life for our country, in the Philippines in 1945. Though, Jerry, never met Dr. Cathcart, the many letters written by Dr. Cathcart to his wife and daughter displayed a man of dedicated character who valued human life and who held strongly to his deep and abiding interest in others. These beliefs are true to the core of the man who we know as Dr. Joseph Gerald Reves, "Jerry."

At MUSC, Dr. Reves spent time in the summers in the lab of Dr. Robert Walton, the Chairman of the Department of Pharmacology. Dr. Walton studied cardiovascular pharmacology and gave Dr. Reves the liberty to study a project of his own, "The Effect of Alcohol on Traumatized Dogs." This project was an impetus for Dr. Reves' choice in career, cardiac anesthesiology. Interestingly enough, at the time, anesthesiology was not a well-respected career. It may have been a hidden calling or perhaps a challenge for Dr. Reves. At an earlier stage in his career, Dr. Reves committed himself to using research, hard work and leadership to promote and engender respect from others for his passion, anesthesiology. Even to this day, it his belief that anesthesiologists are the leader's of medicine and that leadership is through innovation in science and research. This was perhaps best illustrated in his Rovenstine Lecture in 2007.

His initial "Great Loop" brought him from Charleston to Vanderbilt and then back to Charleston. He decided to continue south and west to the University of Alabama at Birmingham (UAB) for a residency in Anesthesiology. In Birmingham, Dr. Reves was at the "center" for Medicine. One of the greatest physicians of the 20th Century was the Chief of Medicine at the University of Alabama at Birmingham, Dr. Tinsley Harrison, the author of *Harrison's Textbook of Medicine.* Dr. John Kirkland, a great innovator and pioneer cardiac surgeon, from the Mayo Clinic, was the new Chairman of Surgery. The head of anesthesia, at the time, was Dr. Guenter Corssen. Dr. Corssen was one of the innovators of intravenous anesthesia. He developed Innovar, "neurolept anesthesia," a combination of droperidol and fentanyl, producing both immobility and analgesia. He was the first to use and explore the pharmacology of Ketamine. Dr. Corssen served as one of the first true anesthesia mentors for Dr. Reves.

Never to venture west or go beyond the Mississippi River, Dr. Reves' journey brings him to the Navy in Bethesda, Maryland, in 1973. Again, as a lover of the water and true to his upbringing in Charleston and to his commitment to humanity, he spent two years in the Navy. Here he met Dr. William Lell. This fortuitous meeting of two individuals would bring him back again to Birmingham, Alabama. Dr. Lell was one year ahead of him in the Navy and was recruited to be the Chief of Cardiothoracic Anesthesia at UAB.

In 1977, Dr. Reves assumed his first leadership role as the Director of Anesthesia Research at the University of Alabama at Birmingham. Kirkland was innovative in developing cardioplegia and myocardial protection via anesthetics became an interest of Dr. Reves. Organ protection during cardiac surgery prompted the concept of brain protection during cardiovascular surgery. This interest in brain function after cardiac surgery became Dr. Reves' primary research direction for about 25 years.

Reves leadership potential was well recognized by Dr. Merl Harmel, the Chairman of Anesthesia at Duke University. Harmel's journey at Duke was similar to his journey at Johns Hopkins. Dr. David Sebastan was a well-known cardiovascular surgeon, with little to no respect for anesthesia as a specialty. However, Dr. Harmel was in a position to choose leaders and followers to pursue his path of equity. Dr. Harmel pioneered the concept of anesthesia being not only a subspecialty separate from surgery but of equal merit as well. In order to achieve equality, anesthesia must achieve excellence in clinical care and research. Dr. Reves promoted this vision, as the Director of Cardiac Anesthesia at Duke. Dr. Reves found a group of individuals with commitments to patient care and scientific inquiry similar to his. He and his team developed a clinical service dedicated to the advancement of care through clinical care and pioneering research. He later became the inaugural Director of the Duke Heart Center for 10 years, and was able to bring surgery, medicine and anesthesia into an effective collaborative team with the primary objective to use both basic and clinical research as a means to provide better care to patients.

Dr. Reves engendered the support of many around him under the mentorship of Dr. Harmel. In 1991, he became the Department Chair, and was on a well-traveled path that posed new challenges and obstacles. In an effort to be better scientists and researchers, Dr. Reves believed that anesthesiologists should be relieved of some of the tedious tasks that prevented research pursuits. He also believed that research must be supported by truth. Hand-written anesthesia records were tedious, subjective and inaccurate. Electronic anesthesia records would help support his scientific endeavors and the results would be truthful and not refuted. He promoted the use of CRNA's as means to allow anesthesiologists to be an important aspect of anesthetic clinical care but be free of the technical tasks that

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limited freedom to do research. CRNA's were team providers but not leaders in the science of anesthesiology. As a mentor, Dr. Reves led many individuals safely down the perilous trail of academic anesthesia to become leaders in anesthesia. In his ten years as Chairman, Jerry Reves had an anesthesia program with national and international recognition.

In 2001, Dr. Reves was appointed to be the Dean of Medicine and Vice president for Academic Affairs at MUSC. He finally closed "the loop" in his academic journey and returned home to Charleston, South Carolina. He served as the Dean for 9 years. He established MUSC as a center for diversity and equity in Medicine. In 2001, he and his wife created the Jerry and Jenny Reves Diversity Scholarship endowment. Reves was able to recruit other leaders in anesthesia and medicine to once again build a program but on a grander scale. True to his interest in the neurosciences, he once again was able to bring three subspecialties together to form one. He established a Neurosciences Department that combined three departments into one, Neuroscience, Neurology and Neurosurgery. He was again able to bring individuals together to create a unit greater than the three alone.

Dr. Reves has been a member of the ASA since 1970. He has been on numerous regional and national committees, often serving in a leadership role. He has served as a founder (1979) and early President of the Society of Cardiovascular Anesthesiologists (SCA). He has also served as President of the AUA from 1997-1999. In 2006, he gave the 45th Rovenstine Lecture: "We Are What We Make: Transforming Research in Anesthesiology. In this lecture he expresses his "professional credo", "I have always been convinced that unless we question what we do and what we know through research, we will never improve by doing things new and better." He uses the General Electric slogan "Progress is our most important project." (Anesthesiology 106: 826-835, 2007)(Further reviewed with many slides in the Winter 2006 AUA Newsletter: **http://www.auahq.org/Winter2006.pdf**) Dr. Reves career in medicine spans 40 years. During this time, he has authored over 255 publications. Though "retired," he still continues to publish often, but enjoys most assisting junior faculty in their efforts to develop an academic career.

In July of 2010, Dr. Reves and his wife Jenny embarked on a different journey, a different pursuit other than medicine. This journey was one less travelled by Reves. In a trawler boat named "Sweetgrass" (named after the beautiful baskets made from sweetgrass by the low country Gullah people) he and his wife Jenny, with their black Labrador retriever, named ACE, made a two-long journey "The Great Loop." The "Great Loop" began in Charleston travelling north along the Intercostal, flowing into the Chesapeake Bay to make their way to the Great Lakes, traversing the Canadian Heritage Canals to travelling south along the Mississippi River. There are several side-trips along America's rivers and the Gulf Coast. They finally traversed the Florida Keys traveled north along the Intercostal and returned home to Charleston. If you go to **www.sweetgrassadventures.com** Jerry and Jenny Reves' personal blog of their 41-foot boat "Sweetgrass," you will get extensive narration of their 5500-mile journey. Of course, using technology at its best, you can find Dr. Reves on YouTube, Facebook and Twitter.

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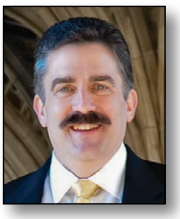

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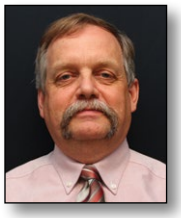

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