

Update

Winter 2016

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64th Annual Meeting CoHosts: Johns Hopkins University & University of Maryland



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The Johns Hopkins Hospital opened in 1889 and the Johns Hopkins University opened 4 years later. Johns Hopkins was a Quaker merchant, banker and businessman, who left \$7 million in 1873 to create The Johns Hopkins University and The Johns Hopkins Hospital. He instructed his trustees to create new models and standards for medical education and health care. Johns Hopkins was named for his great-grandmother, Margaret Johns, her last name becoming his first (and confusing people ever since!).

Our department cherishes our history and traditions. With regard to Research Discovery, our department seeks to establish the preeminent center for innovative multidisciplinary research that fully engages our trainees, faculty and staff in productive discovery that is fully integrated with our Department and Institution. Our faculty include world-class investigators conducting multidisciplinary research in a number of areas with major programs in Cardiovascular, Cerebrovascular, Neuroscience, Pulmonary, Pain, Patient Safety and Health Outcomes and Perioperative Research. Our Department had \$20,599,803 in research funding in FY 16; \$8,628,109 came from the NIH. Our Clinical Research Core has over 38 ongoing Clinical Trials and Cohort studies. The department had over 250 research publications in the last fiscal year. The NIH awarded our department a T-32 Postdoctoral Research Training



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*Wei Chao, MD, PhD
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The oldest public medical school (and the fifth oldest overall) in the U.S., the University of Maryland School of Medicine is situated on the western outskirts of downtown Baltimore, adjacent to Oriole Park at Camden Yards. Anesthesiology at the School of Medicine and the University of Maryland Medical Center (UMMC) has a history as rich as Baltimore City itself. As a medical discipline, Anesthesiology at the University of Maryland Hospital began in 1913 with Dr. Griffith Davis, the only physician in Baltimore who practiced anesthesiology full-time. The residency program was established in 1946 with a team of five residents. In 1956, Anesthesiology was formally recognized as an independent department within the University of Maryland School of Medicine. Dr. Martin Helrich was recruited to Baltimore and named Professor and Chair of the nascent department. In 1986, upon the retirement of Dr. Helrich, Dr. M. Jane Matjasko was appointed Chair. In 2006, Dr. Peter Rock was appointed our current Chair.

The last decade has seen dynamic growth within the Department, with a current roster of 360 people, including: 80 faculty members; 9 fellows; 45 residents; 75 CRNAs, and 40 research faculty, post-doctoral fellows, and support staff. Eight departmental faculty are Association of University

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AUA President's Column



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The AUA council met to finalize the plans for our 2018 meeting in May. Although the annual meeting is a very important feature of the AUA, the AUA council expressed a desire to also make the meeting a place to network so as to increase the quantity and quality of research in our field. Anesthesiologists have success rates in obtaining funding from the NIH similar to that of internal medicine physicians. The number of grants submitted by anesthesia faculty is however, only a small percentage of the total grants submitted. This can be improved and should be a mission of the AUA.

Similarly, the education research presented at the AUA represents the major opportunity for our educators to present their research efforts and to network. We would like members to invite the program directors interested in education research to come to the meeting to expose them and to interact with the people involved in education research.

Our membership has been expanded to include both younger scholars and international members. This was done to improve our ability as a field to help our young faculty and trainees to network, collaborate and learn about all forms of research and to succeed in research. Finally, our affiliation with the IARS has documented our alignment with international researchers and should help us become the premier meeting for academic anesthesiologists.

Therefore, the meeting is becoming a tool to expose our trainees and faculty to cutting edge research, in education as well as in clinical, basic and translational arenas. Our scholars are meeting to increase collaboration from an early stage. The AUA not only wants to honor our successful faculty involved in improving patient care and education, but wants to insure a great future for our newest faculty and trainees.

64th Annual Meeting Cohosts (Koch)

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program in Anesthesiology, which is reflective our commitment to developing clinician-scientists who will be our future leaders in the field of anesthesia research.

Our 13 Clinical Divisions with over 200+ physicians, 100+ CRNAs and 100+ residents and fellows provide robust clinical services on 3 campuses in Baltimore. Our department serves an integral part of Perioperative Services and leverages Johns Hopkins Medicine's new Capacity Command Center (developed in collaboration with GE) to manage patient flow throughout the hospital continuum. Our Educational programs are broad-based and innovative. We are committed to professional development of our department members via contemporary leadership training in Serving Leader competencies, customer service / patient experience training and development and training in Behavioral-based interviewing for prospective department members. In addition to a commitment to Research, Education and Patient Care, our Department is committed to and has ongoing activities aligned with John Hopkins Medicine's other 3 Strategic Initiatives of Patient and Family-Centered Care, Performance and System Integration. Our Department's Serving Leader Project Management Office manages over 70 on-going Strategic Initiatives advancing the Mission, Vision and values of Anesthesiology and Critical Care Medicine at Johns Hopkins. We invite you to visit our newly designed website to learn more about our faculty and Department's initiatives.

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.**

64th Annual Meeting Cohosts (Rock)

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Anesthesiologists (AUA) members. Generous benefactors have funded four endowed professorships.

The Department provides 37,000 anesthetics per year at seven separate locations: UMMC (including the R Adams Cowley Shock Trauma Center) in downtown Baltimore; the adjacent Veteran's Affairs Hospital; the University of Maryland Rehabilitation and Orthopaedic Institute (UMROI) in suburban Baltimore; the University of Maryland Midtown campus 10 blocks from the main campus; Dimensions Prince Georges County Medical Center (outside of Washington D.C.); and at an ambulatory surgical center in Columbia, MD. Faculty members also care for patients at the Maryland Proton Treatment Center, the region's only proton treatment facility, located in the University of Maryland, Baltimore Biopark, adjacent to the School of Medicine. The Department also has a Pain Medicine practice with locations at UMROI and Columbia, Maryland.

Clinical highlights of the Department include pre- and intraoperative care of patients in our busy solid organ transplant program including heart/lung, kidney/pancreas and the second busiest liver transplant service in the US. Seven board-certified pediatric anesthesiologists provide anesthesia for a comprehensive neonatology and pediatric referral program, including open and trans-catheter cardiac procedures. Our obstetric anesthesiologists daily provide care for critically-ill pregnancies and participate in a robust fetal surgery program. The Division of Critical Care Medicine provides attending coverage in five intensive care units of UMMC and help staff the busiest extracorporeal membrane oxygenation (ECMO) program in the country. Eight cardiac anesthesiologists care for patients in what is now the largest cardiac surgery program in the State of Maryland. Our program in Regional Anesthesia, both at UMMC and UMROI, is a leader in the provision of nerve blocks for intra- and post-operative care, providing the region's only 24/7 ambulatory continuous nerve catheter services.

The nation's first center dedicated solely to patients with Trauma was begun at UMMC in the 1960's. One of the original three anesthesiologists, Dr. Colin Mackenzie, is still a participating member of the faculty and a member of the AUA. The R Adams Cowley Shock Trauma Center, a "hospital within a hospital," is staffed by 14 faculty anesthesiologists as well as residents, fellows, and CRNAs. Faculty anesthesiologists are assigned clinical duties in the Trauma Resuscitation Unit, anesthetize 6,000 cases in the trauma operating rooms, and staff a dedicated trauma pain service.

Over the past few years, the Department has developed a program in safety and quality recognized by the University of Maryland Medical System (consisting of 12 affiliated hospitals) as the standard against which other safety programs in the system are measured. The department has a dedicated faculty Chief Safety Officer and a Master's level Patient Safety and Quality Coordinator. Anesthetizing locations at all sites utilize robust Anesthesia Information Management Systems which feed a searchable Anesthesia Clinical Registry (ACR) that contains not only intraoperative data but relevant pre- and post-operative

information, including data from the Social Security Death Master File. The ACR is IRB approved, facilitating clinical research.

The Maryland Anesthesiology Program in Simulation (MAPS) provides trainees with multiple task and training models, and multiple different clinical scenarios, teaching crisis management and team-based responses to critical events. There are two fully-equipped simulation facilities at UMMC. The Anesthesiology department manages one of these facilities (MASTRI, the Maryland Advanced Simulation, Training, Research and Innovation Center) which is located in a decommissioned suite of operating rooms that provides realistic and high-fidelity simulation experiences. MASTRI is certified by the American Society of Anesthesiology for the purpose of providing maintenance of certification in anesthesiology (MOCA) and is the only civilian simulation facility in Maryland that has such certification. MAPS partners with the Program in Trauma's Simulation facility, holding some of its training sessions in that location. MAPS provides four task training modules per year for faculty members, holds sessions for interested medical students and hosts six MOCA simulation courses per year.

There are four main areas of NIH-funded research in the Department: 1) mechanisms and treatment of traumatic and ischemic brain and spinal cord injury; 2) sepsis and myocardial injury; 3) acute lung injury; and 4) critical-care outcomes research. In addition, Department of Defense-funded investigators lead programs in: 1) aeromedical transport safety; 2) developing predictive clinical algorithms for life-saving interventions such as transfusion or intubation using bedside monitoring data; and 3) education research. In the current academic year, 17 anesthesiology researchers received a total of \$7.9 million in grant awards from various sources, including: the NIH and the VA (\$5.2 million); the Department of Defense including the US Air Force (\$2.4 million); and, industry, foundation and associations (\$300,000). In the last two academic years, faculty published 193 peer-reviewed manuscripts and gave 114 presentations. Many of these studies were performed in collaboration with faculty from other clinical and basic science departments within the University of Maryland School of Medicine, which maintains annual extramural research of \$402 million. Additionally, the Department is a major participant in trans-campus research with both the University of Maryland College Park and the University of Maryland Baltimore County. A senior department faculty member has a leadership role in the new University of Maryland Human Performance Center being built at College Park.

Over the past 60 years, the Department of Anesthesiology at the University of Maryland School of Medicine has grown in size, reach, and stature. It is now a research powerhouse with patient care responsibilities spanning the spectrum from outpatients to the highest acuity patients undergoing the most complex surgery. A robust training program takes advantage of the rich educational environment. The department is well-positioned for another half century of growth.

Education Advisory Board Report

Mindfulness and the Anesthesiologist: What it Means for Personal and Professional Development



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*My candle burns at both ends;
It will not last the night;
But ah, my foes, and oh, my friends—
It gives a lovely light!*

— Edna St Vincent Millay
(A few figs from thistles)

Medical professionals today are under tremendous stress both at home and in the work-place. This statement is especially true for an anesthesiologist, whose training is based on being prepared for the next possible event, and who is constantly thinking of the next three steps while performing the task at hand. An anesthesiologist is planning for the next case while finishing the current one or is checking on the previous patient in the post anesthesia care unit while administering anesthesia to the current patient. An anesthesiologist is planning for things to get to when leaving work, and is thinking of problem patients when at home. Another compounding factor is the stress that comes with the frequent clash between values and the reality of working in a complex healthcare system. Educators may feel that the time and value placed on education is inadequate, and this belief may lead to feelings of resentment and affect the quality of work. Administrators may feel their hands tied when it comes to supporting their staff. Researchers may find themselves faced with the probability of giving up work due to inadequate funding. There are tangible consequences to the stress and the burnout that it causes, as it can directly affect performance and communication, both with the patient as well as colleagues. This occurrence ultimately leads to less than optimal clinical care, affects patient safety, and affects personal satisfaction at work and home.

It is no wonder that the statistics on the prevalence of burnout has sky rocketed in recent years and has gained attention at the national and international stage.¹ Although this problem was ignored in the past and attributed to the ‘cost of being a doctor’, there is increasing recognition of the problem of burnout among physicians in general, and anesthesiologists in particular. The surgeon general, Dr. Vivek Murthy, highlighted key issues regarding the problem in his keynote address to the association of healthcare journalists in April of this year (<https://goo.gl/wgZ8Be>). Emotional wellbeing of physicians was one of the two healthcare areas the surgeon general’s office has targeted this year. “If healthcare providers aren’t well, it’s hard for them to heal the people for whom they are they

caring” he said. Faculty today have multiple roles as clinicians, educators, researchers and administrators. The demands of all these roles within the limited time available takes a toll on these high achieving individuals who strive to do their best in each role. A number of institutions and societies have recognized the importance of physician wellness to their performance in the healthcare setting. Patients and institutions do well when the members of the healthcare team are healthy and experience personal and professional satisfaction.

The past decade has witnessed an increased awareness of the importance of self-care in all realms, physical, mental, emotional and spiritual dimensions of our life. Along with the awareness of the importance of healthy eating and exercise to keep the body fit, we are also cognizant of the significance of social interactions to maintain emotional vigor and introspection for spiritual health. Although there was a general belief of the importance and need for ‘spiritual’ growth and ‘peaceful living’ in the past, there was really no evidence to support any significant outcomes for individuals who practiced these beliefs as compared to those who did not. It was only recently that the myth of the ‘unchangeable brain’ was exploded and it was realized that mental activity could actually influence the structure and function of the brain. This finding was a radical idea. Just as physical exercise could change the strength and stamina of different muscle groups, so too different types of mental exercise could change different areas of the mind and induce new neural connections.

One concept that has gained widespread interest is that of ‘Mindfulness’ (there are more than 3000 articles in Pubmed on the topic!). There are many definitions of mindfulness. Jon Kabat Zinn, one of the leading experts in the field, describes it as “the awareness that arises from paying attention on purpose, in the present moment, nonjudgmentally”. Mindfulness requires acknowledgement of all states of awareness without judgment. As Dr. Kabat Zinn says in his book *Coming to Our Senses*, “It is not the content of your experience that is important. What is important is our ability to be aware of that content, and even more, of the factors that drive its unfolding and the ways in which those factors either liberate us or imprison us moment by moment and year in, year out.” Most teachers view the practice as an act of love, both towards ourselves and others, accepting of the gift of this moment which the individuals are privileged to experience. If practice really does improve performance, then being angry all the time will make one better at being angry, and mindfulness allows the understanding and encourages practices that improves oneself. It allows us to voluntarily direct our attention to the subject of our choice. Research into what happens at the ‘neuroscience’ level when individuals practice mindfulness has shown that there is overwhelming appearance of γ -oscillations especially in the pre-frontal region of the brain,

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the region implicated in synaptic plasticity. Another function of the brain that is affected by the practice of mindfulness is the ability of the amygdala to recover after stress.² Mindfulness based stress reduction (MBSR) has gained popularity as a method to decrease stress among health care professionals and improve patient care. Before training in MBSR, brain imaging shows that people have increased activity in the midline of cortex in the default network which creates a narrative about one's experiences, and after training, the activity in that network decreases. Training in mindfulness has been associated with decreased stress, improved resilience, and improved empathy in health care professionals. The limitations with a majority of the studies in this field is the length and quality of training, as the practice requires a good teacher, and requires participants to practice it daily. (Mindfulness really requires a life time of practice, with introductory courses ranging from 2-2.5 hours per week for 2 to 3 months with ongoing daily practice). Ironically, the people who need it the most are the ones who cannot find time to devote to this practice exclusively! There is also a growing body of literature in cognitive science that looks at the science of happiness, and the hypothesis that happiness is a skill that can be developed by practice with a positive correlation between happiness and health.

A number of studies show that even brief training in mindfulness practices demonstrates significant benefits for the health professional. A study conducted at the Ohio State University showed that need for mindfulness training was felt by wide variety of health professionals who were offered an online mindfulness course. Those who completed the online training had significant increase in mindfulness scores. Studies such as this compel us to examine the possibility that online exposure to mindfulness training may be an attractive option for those who feel they do not have the time for in-person training.³

Mindfulness Assessment: There are a number of scoring systems that have been used in studies and can be used to assess qualities of compassion and empathy among physicians.

1. Cognitive and Affective mindfulness scale- revised (CAMS-R) which is a 10-item scale
2. Baer's Five Facet mindfulness questionnaire (FFMQ): 39 item
3. Mindful attention awareness scale (MAAS): 15 item
4. Neff's self-compassion scale: 12 item
5. Calm, compassionate care scale: 10 item
6. Santa Clara brief compassion scale: 7 item
7. Smith's brief resilience scale: 6 item
8. Empathic concern scale: 7-item

In response to the increasing awareness of the problem of burnout, residency programs have implemented 'resiliency' courses that include mindfulness.⁴ When mindfulness programs are offered to employees, it has been seen to increase self-care among participants and decrease health care utilization and hospital admissions among participants.⁵

Anesthesiologists now have a heightened awareness of the problem of burnout. The ACGME recognized the importance of personal well-being and included this aspect as one of the milestones under "Professionalism 5: Responsibility to maintain personal emotional physical and mental health". This inclusion implies that programs now have a responsibility to assist both residents and faculty in attaining this milestone. In order for individuals to flourish and be creative, they need to feel a sense of *control* over their conditions of work, and need to feel there is *meaning* in work. This desire indicates that the obligation lies both at the personal level and at the institutional level. The institution and the leadership need to make sure that its employees are valued and they have input into the working conditions. The individual needs to insure that he/she is in the best possible condition to work and has the coping skills to deal with setbacks at home or at work. Programs that teach these skills need to be available at every institution and should be accessible to all personnel. Only then, the ability to produce physicians who are able to engage positively with patients will exist. This goal will logically lead to a happier workforce and ultimately the ability to deliver high quality care with better patient outcomes.

Resources for further study:

1. Books:

- a. Jon Kabat Zinn: Wherever you go, there you are. Coming to our senses
- b. Dr Daniel Siegel: The mindful brain
- c. Sharon Salzberg: Real happiness

2. Apps:

- a. Headspace: An app for guided meditation and mindfulness – Subscription
- b. The mindfulness app- Free Includes guided and silent meditations with premium membership which can be purchased and includes courses by distinguished teachers
- c. Brainwave: An app that has isochronic tones that induce relaxation. Has in-app purchases.

3. ASA resources:

- a. ASA Advisory group on Physician Health and wellbeing
- b. Website resources: <https://goo.gl/Ew0SJI>

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With regard to attrition, several studies have examined faculty turnover at academic medical centers.^{9,10} According to these studies, 50% of clinical faculty resign their appointments within 10 years, and nearly 40% leave academic medicine entirely.⁹ So what is driving force behind this academic exodus? Invariably it is the perception of a toxic culture with the most common stressors cited being: financial pressures,^{11,12,13} growing compliance and regulatory issues,¹⁴ and lack of faculty development, proper mentorship or hardship balancing family and work demands.^{14,15,16} So, while it is true that a persistent level of turnover has always been a fixture of academia, statistics suggest we are quickly approaching a tipping point. Indeed, current levels of physician attrition represent a serious loss of human capital (both financial and intellectual) which has already begun to threaten the teaching and research service missions of many academic institutions.^{17,18,19,20}

And here is the punchline - faculty attrition is likely to become even more problematic in the future with estimated physician workforce shortages of more than 90,000 expected within the next decade.²¹ This change in the professional landscape will likely increase competition for physicians between the private sector and our academic medical centers. Coupled to an aging physician workforce²² and an ever increasing number of younger physicians who possess radically different views on work-life balance²³ the burden on academic centers to recruit and retain dedicated clinical faculty will undoubtedly exacerbate. Sadly, these results do not make for a good bedtime story. All one has to do is look around. When I force my perseverant focus away from my research to examine what is happening around me – I am aghast at all the friends and colleagues who have moved on. Beyond the loss of collegiality lies a darker reality physician-scientists need to wake up to ... and that question is “When everyone else is gone what do you imagine will happen to your non-clinical time?” If my overtures about scientific legacy and maintaining a culture of intellectualism earlier in this essay did not stir you – I wonder, did this last part get your attention?

Thankfully, the ending to this story has not been written. The opportunity to steer clear of this impending crisis still exists. The trillion dollar question is how do we (in the collective sense) get out of this mess? I believe the answer lies in what other sectors/institutions have done when facing similar issues. Perhaps we need to look to the success stories in corporate America? Where companies are actually thriving (and not just surviving) – you see adherence to themes of institutional accountability and a willingness to implement a cultural change. Invariably, these companies have successfully navigated the quagmire of retaining long-term productivity by first focusing on sustainability and by creating value from a systems perspective. Observe Google. Marvel at Unilever. Explore Virgin Atlantic. And examine the principles underlying six sigma.

The remarkable thing is as a specialty - Anesthesiology has done this before. By taking accountability for bad outcomes (i.e. closed claims analysis) to propel patient safety initiatives – we have walked this road already in our not too distant past.

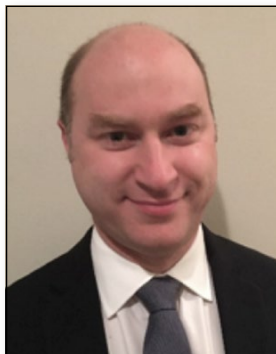
By creating a cultural change around the positive theme of enhanced patient safety – we opted for sustainability and in doing so we created value from a systems perspective. We are capable of doing this again.

Although I have my own opinions about how that could be done, I will end here with a small vignette to illustrate where I believe the first steps on this journey should begin from..... A prominent chairman in our specialty recently confided in me that there was no room for people in academics who were not willing to make lifestyle sacrifices. While that mentality may have been incredibly “productive” at propelling people to sacrifice everything for academic pursuits – it was viable only during a different time and context in medicine. Today, that rigid mentality will run aground the iceberg that is physician burnout – and like the Titanic, I believe academic medicine will not survive that collision. The times call for brave yet flexible leaders, not stubborn adherence to antiquated dogmas. For success, participation will be required from everyone... from ME, from YOU, from junior faculty up towards specialty leadership. We need to change the culture and to do so we need innovative thinkers and a new set of values that prioritize sustainability over productivity.

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Clinical Informatics – a New, and Unique, Medical Subspecialty – Relevant to Anesthesiology



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Informatics is a multidisciplinary scientific field that studies how information and knowledge are generated, collected, organized, stored, processed, retrieved, presented, used and shared. A major focus is on computer information and communication systems and how these systems effect and interact with their human users, both individuals and groups. As such, it builds on and contributes to, a multitude of fields which include computer, behavioral, cognitive, social, information and management sciences as well as statistics, psychology, and many others.

Biomedical Informatics (BMI) is a branch of informatics aimed at improving human health via the application of informatics theories and methods to healthcare in all of its facets – clinical care, population health, education and research. Similar to the way informatics focuses not just on technology itself but also on the interaction between it and people, so too BMI seeks to understand the effect of health information technology (HIT) on its human users and on the organizations and systems where it is used. The importance of the interaction between HIT and healthcare delivery systems is gaining increased attention as it is becoming more apparent that poorly designed technology negatively impacts patient safety by leading to increases in medical errors and patient harm.

Rapid synthesis and interpretation of information about a patient's condition and the application of that information to the delivery of safe and efficient patient care is at the core of the practice of anesthesiology. Due to this data-driven approach to patient care, anesthesiologists tend to be tech-savvy, embracing technological advances, especially those that improve patient safety. Two notable examples are: pulse oximetry which, as a new source of rapidly available information about a patient's condition, was a leap forward in anesthesia safety, and Anesthesia Information Management Systems (AIMS) which, by assisting in the recording and processing of information, freed the provider to focus on the patient. It is no surprise then that anesthesiologists have been, and continue to be, leaders in the field of biomedical informatics. From databases for outcomes research (i.e. Multicenter Perioperative Outcomes Group) and quality improvement (i.e. Anesthesia Quality Institute's National Anesthesia Outcomes Registry), to the use of information and communication technology for education (i.e. Stanford's Anesthesia Informatics and Media Lab), to the work on peri-operative notification and communication systems and personalized medicine (i.e. Vanderbilt Anesthesiology and Perioperative Research Division), anesthesiologists are leading

the way in informatics research and application across a broad spectrum of the healthcare process.

In addition to tech-savvy and a focus on safety, teamwork and multidisciplinary collaboration are also at the core of both anesthesiology and BMI. Effective interactions not just with surgeons but with a multitude of other specialists and health care providers are a part of the daily life of anesthesiologists who function as an integral part of a team whose goal is to deliver healthcare, with special emphasis on safety, effectiveness and efficiency. Similarly "physicians who practice clinical informatics (increasingly known as informaticians, or informaticists) collaborate with other health care and information technology professionals to promote patient care that is safe, efficient, effective, timely, patient-centered, and equitable".¹

The newly recognized medical subspecialty of Clinical Informatics (CI) is thus likely to be of great interest to many already in the field, and to those preparing for anesthesiology careers. This article discusses the history of this new medical subspecialty and the pathways (present and future) for board certification.

Clinical Informatics – a New, and Unique, Medical Subspecialty

As the amount of knowledge in medicine expands, some fields grow large enough to warrant their own training programs and certifications, and new medical specialties and subspecialties emerge. In the United States the approval of new specialties and subspecialties is overseen by the American Board of Medical Specialties (ABMS) which consists of 24 Member Boards corresponding to the primary specialties. The specialty of Anesthesiology was recognized in 1941 when the American Board of Anesthesiology became a member of ABMS. The latest specialty to be recognized was Medical Genetics and Genomics in 1991.

The ABMS also recognizes 127 medical subspecialties, with CI being among the latest to be recognized. Subspecialties are sponsored by at least one member board, but may be open to candidates with primary certification from other (non-sponsoring) boards. CI as a subspecialty is unique in that it is open to candidates with primary certification from any of the 24 member boards. This is because it is considered an important component of practice, research and education of all medical specialties.² Physicians with a wide range of interests and backgrounds can thus combine their expertise and unique understanding of the care process in their primary specialty with informatics expertise to transform health care by analyzing, designing, implementing, and evaluating information and communication systems to improve patient care, enhance access to care, advance individual and population health outcomes, and strengthen the clinician patient relationship.³

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More specifically, clinical informaticians combine clinical knowledge with informatics concepts, methods and tools to:

- Assess information and knowledge needs of health care professionals and patients;
- Characterize, evaluate, and refine clinical processes;
- Develop, implement, and refine clinical decision support systems; and
- Lead or participate in the procurement, customization, development, implementation, management, evaluation, and continuous improvement of clinical information systems such as electronic health records and order-entry systems

A Brief History of the CI Subspecialty

In the latter years of the past century and the early part of the current one, as more physicians dedicated increasing amounts of time to the practice of BMI, it became apparent that formal training and certification would be needed to sustain the demands of a medical informatics workforce, and a demand for a subspecialty arose. Thus the concept of an informatics subspecialty was born. Unfortunately, just as a seed needs nurturing soil to blossom into a flower, so too a concept needs a supportive environment in order to flourish and become a reality, and the concept of an informatics subspecialty lacked such an environment, it was ahead of its time. Though the demand was there, an effort, led by pathologists, to create a formal subspecialty was not successful.

Fast forward to the year 2004, when President George W. Bush's call for widespread use of electronic health records intensified the need for a medical informatics workforce, thus fueling an increased demand for informatics to evolve from "a part-time activity of self-identified informaticians to a fully recognized medical profession with training, standards, codes of ethics, and certification".² The informatics subspecialty concept now had a supportive environment in which to thrive. It was in this environment that a town-hall discussion at the 2005 annual meeting of the American Medical Informatics Association (AMIA), the membership concluded that there was a need for, and recommended the development of, a formal CI certification program for physicians. The AMIA board adopted these recommendations as formal policy and approved efforts to secure the necessary funding.⁴

In March 2007, with financial support from the Robert Wood Johnson Foundation, AMIA formed two teams to draft documents that would be necessary for the formation of a subspecialty – the Core Content for,¹ and the Program Requirements for Fellowship Training in³ the Subspecialty of Clinical Informatics. The prior of the two is a prerequisite for consideration as a subspecialty by the ABMS, and the latter is a basis for accreditation of training programs by the Academic Council on Graduate Medical Education (ACGME). In November 2008 the AMIA Board approved both documents and the search for a primary ABMS member board to serve as the sponsor began. In July of 2009 the American Board of Preventive

Medicine (ABPM) agreed to serve as the primary sponsor. The American Board of Pathology (ABPath) agreed to serve as co-sponsor. In 2010 the ABPM submitted a formal application to the ABMS for the creation of a CI subspecialty. After extensive review, the proposal was approved by the ABMS Board on September 21, 2011 and a CI subspecialty was officially born!

Board Certification in CI

The first board exam was offered in October 2013 with 456 physicians achieving board certification (91% pass rate). To date 1107 physicians have achieved certification – 331 in 2014 (91% pass rate) and 320 in 2015 (80% pass rate). The 2016 exam was offered from October 3-14. The exam consists of 250 multiple choice questions based on the Core Content of the Clinical Informatics Subspecialty document.¹

All physicians wishing to become board certified in CI must pass the board certification exam. Applications for the examination are submitted through the ABPM by all physicians, with the exception of those whose primary specialty is Pathology, who must apply through ABPath. (ABPath requirements will not be discussed in this article.) Eligibility for the exam is determined by the ABPM based on the following requirements:

- Applicant must be certified by one of the member boards
- Applicant must have graduated from an accredited medical school in the United States or Canada, or a foreign school deemed satisfactory by the Board
- Applicant must hold a current unrestricted license to practice medicine in the United States or Canada
- Applicant must complete either the Practice Pathway OR the Fellowship Training Pathway

Completion of the Practice Pathway requires three years of broad based professional activity with significant CI responsibility (research and teaching activities also considered) over the preceding 5 years. This activity need not be continuous and must be at least at 25% Full-Time Equivalent. Training of less than 24 months in a non-accredited CI program may also be used to satisfy part of the activity requirement. Finally, activity that occurred during medical training (residency or non-CI fellowship) will not be counted toward the activity requirement.

Completion of at least 24 months in a non-accredited CI fellowship program deemed acceptable by the ABPM can be used to satisfy the Fellowship Training Pathway.

As with many other newly established subspecialties, these pathways are intended to allow physicians not formally trained in CI to become board certified (i.e. "be grandfathered in"), and are usually only available for five years after the 1st certification exam, a period of time often referred to as the "grandfathering period". Initially the grandfathering period for the CI subspecialty was also 5 years, and the last opportunity for those already in the field to take the exam without completing a formal ACGME-accredited CI fellowship was 2017. However the ABPM recently decided to expand this period by an additional 5 years and the last exam to those without a formal fellowship will

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now be offered in 2022. Because of the extended grandfathering period physicians with a primary board certification or those soon to be certified (i.e. those near completion of residency training) but not currently practicing CI can now qualify for the board examination by committing an appropriate amount of time (three years at > 25 % Full-Time Equivalent) to CI work over the next six years.

CI Training Programs

Starting with 2023 only those applicants who successfully complete a 24 month ACGME accredited CI fellowship will be permitted to apply for the exam. On July 15 2014, Stanford's CI fellowship program became the first ever to receive ACGME accreditation. Currently there are 24 ACGME accredited CI fellowship programs (see <https://goo.gl/1TtNKS> for updated list). Though open to applicants from all specialties, each CI fellowship undergoes review and accreditation by a Residency Review Committee (RRC) for anesthesiology, diagnostic radiology, emergency medicine, family medicine, internal medicine, medical genetics and genomics, pathology, pediatrics, or preventive medicine, and is subsequently administered via the corresponding ACGME-accredited residency at the institution. The Anesthesiology RRC granted accreditation to Vanderbilt's CI fellowship in September 2015. Because of the number of different RRC's involved, questions as to the uniformity of accreditation standards amongst them remain. Questions regarding sources of funding for CI training programs also remain unresolved. Finally, it remains to be seen if enough training programs and fellowship spots will be created to meet the rising need for CI subspecialists.⁵

Conclusion

Anesthesiologist's collaborative nature, their focus on safe, efficient, and timely delivery of patient care, and their embrace of technology are all qualities that are at the core of medical informatics. Because of this intersection of core qualities anesthesiologists are "natural" informaticists. Those anesthesiologists already practicing informatics are strongly urged to seek formal certification attesting to their expertise in the field of CI by applying to sit for the board examination. Though the grandfathering window has been extended to 2022, applying as early as possible is recommended. Doing so allows for adequate time to address any issues with the application (i.e. the need for additional CI experience), should they arise. Finally, all current anesthesiologists who desire formal training in informatics should consider a CI fellowship, as should anesthesiology trainees and those considering anesthesiology as a career.

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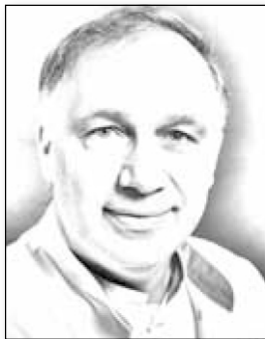
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Management Matters: The Burden Caused by Administrators and Managers A Euro-American Jumble

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We argue that a jumble of rules, protocols, checklists has emerged, which jeopardises not only the pivotal relationship between doctor and patient, but also the quality and costs of care, and the quality of future healthcare workers. It must be emphasised that the introduction of protocols and checklists in clinical medicine has improved care at some points and in some places, and it has similarly contributed to a reduction in errors. However, the onerous bureaucratic rules, regulations, protocols, certifications and credentialing imposed by administrators and “oversight” organisations have become disproportionate to its original objectives. We plead that clinicians realise that the time has come to rebel against this and come into action.

Caring for the sick and dying is a privilege that society has bestowed upon physicians. Patients and their families trust physicians with their lives and health. Physicians spend years in training and ongoing professional development with the goal of providing the highest quality of care with compassion and humility. However, the culture of modern medicine has rapidly eroded the unique and time-honoured relationship the physician has with his/her patients.

Increasingly, hospital administrators, insurance providers, quality organisations and a myriad of regulatory agencies are dictating how physicians should practise medicine. Unfortunately, too many of the individuals creating and enforcing these regulations have little or no knowledge of the complexity of the practice of medicine. They regard physicians as labourers working in a widget factory. Consequently, physicians have lost autonomy and the sacred patient-physician relationship has been corroded. In this new environment, the dehumanisation of the patient-physician relationship is at risk of being exacerbated by the new generation of healthcare providers, trained in this—in our view—undesirable environment.

This new generation of clinicians is at risk of being brought up lacking the concept of hard work and dedication, “patient ownership” and responsibility.

With the exponential growth of medical knowledge and technology, clinicians are continuously being challenged by complex new diagnostic and therapeutic interventions. Simultaneously the organisation of patient care is changing, with an ever-increasing number of organisations and non-medical individuals involved in the delivery of healthcare. Society demands, and rightly so, accountability regarding the quantitative, qualitative and financial aspects of patient care. In response to these demands, hospital managers and administrators, individuals with little or no knowledge of medicine, have become increasingly involved in almost all aspects of the delivery of care. In order to have—apparent—total control over the entire patient experience, these managers demand the use of numbers and measurements as a reflection of the quality of care delivered. An additional factor that is emerging in Europe, which has followed the movement in the United States, is the regulatory demand that all possible adverse outcomes be outlawed. At first sight this would seem reasonable; however, medicine is not a perfect science, and sick patients will develop complications no matter how hard one tries to avoid them. The sicker and more complex the patient the greater the likelihood that a complication will occur. The institution of punitive measures (financial, otherwise or in terms of reputation damage) in response to a bad outcome will frequently lead to changes in behaviour which may compromise patient care, eg not doing blood cultures in a case of suspected catheter-related bloodstream infection to prevent the diagnosis being made.

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Another misunderstanding is the belief that there is only one truth. Diversity in medicine, patients and diseases is so big that it seems inconceivable that one solution for complex syndromes like sepsis, with many possible underlying diseases, in the form of a protocol and checklists, is advocated. Yet what we see, with the intention to rule out all possible risks and errors, is an increasing number of rules, legislation and protocols. Oddly enough, professional medical societies have not protested against this movement; on the contrary, they have frequently endorsed and perpetuated this approach. The result is a jungle of rules and protocols from medical and scientific societies, governmental and other non-medical bodies such as insurance companies. Physicians and clinical leaders are confronted with more and more requirements, rules, audits, inspections, compliance training and protocols, imposed by governmental and nongovernmental organisations, insurance companies, accreditation organisations, inspectorates and boards of directors of hospitals. With all the regulatory administrative tasks that physicians are forced to undertake, it is not rocket science to realise that less and less time remains available for the primary process: patient care. Apart from impacting patient care, the time wasted jeopardises clinical research, education and the training of students and registrars. Additionally, research and training are hampered by an increasing number of rules, regulations and mandatory non-functional courses. Many of these mandatory courses are not only meant for the teachers, but also for their PhD students. The distance between workers on the shop floor, the healthcare workers, and on the other hand those people who make the regulations is growing and they speak different languages. All kinds of bodies and committees in hospitals offer training programmes, the additional value of which is questionable in terms of patient outcome or educational quality. It might come to one's mind that these bodies are mainly preoccupied with providing new work for themselves, creating rules, work and training programmes of unclear benefit.

A simple recent survey that the first author (AG) conducted among some board directors of hospitals demonstrated that they have insufficient insight into the huge number of obligations imposed by different bodies on medical specialists and nurses. **Table 1** provides an incomplete but illustrative overview of the Dutch situation.

The quality movement has imposed the increased use of protocols and checklists with the intention to improve quality of care. This is accompanied by obligatory ticking off and securing of lists that go through implicit procedures. While protocols were initially intended to provide up-to-date medical knowledge translated into clinically and practically applicable information, currently all kinds of procedures need to be embodied in protocols, which need to be secured by checklists and repeated evaluation according to a plan-do-check-act cycle. Subsequently, compliance to the protocol is used as a marker of quality. Undeniably this approach has induced improvement on certain fronts (Girbes et al. 2015; 2016). But it is now getting out

Table 1. Examples of Imposed Managerial Tasks, Training and Registration Programmes in the Netherlands.

Quality inventory list of care processes with priority list and improvement actions (eg is the pulmonologist present during lung surgery? Is there a registry of all complications? Is there a protocol for the treatment of pneumonia? etc.)
Yearly obligatory report of several "performance parameters" (imposed by inspectorate)
Participation in national safety management system (eg participation in and report of Surviving Sepsis Campaign, number of reoperations after hip replacement, number of central venous line infections, yearly training in CPR for all physicians, etc.)
Participation in hospital accreditation programme (eg Joint Commission International)
Registry of every employee on knowledge of manuals of all devices in the department
Registry of followed training programme of nurses and physicians
Course for fire extinguisher use
Participation in practice for calamities
Participation in practice for evacuation
Courses to work with electronic patient file
Training in lean management
Audits: (Audits for training programmes, safety audits, audits for employee working condition, audits for material handling, etc.)
Yearly satisfaction measurements for trainees on a large number of items (System of evaluation of teaching qualities – SETQ – and Dutch residents' educational climate test)
Imposed training programmes for PhD students
Critical Performance Indicators (McKinsey & Company)
Teach the teacher courses (level 1, 2 and 3)
Basic Qualification for Education (see text)
Test for English language knowledge
Training programmes for addressing other people/issues

of control. Moreover, a trend can be observed that for every rare incident a new protocol is created, without taking into account how a new protocol might induce new errors. For example, in addition to double checking the preparation of a medicine by an intensive care nurse, a new additional obligatory protocol was introduced (in the Netherlands) without any evidence or calculation of the consequence. This protocol requires that immediately after the double check of the medication an additional double check is required at the time of administration of the medicine. This of course requires another ICU nurse to abandon their current activity, move to another patient, check what is given, and then go back to continue the interrupted work. It is beyond doubt that frequent interruption of work will induce other errors (Westbrook et al. 2010). Of course continuous double checking would be a dream scenario, if feasible in terms of human factors. This would however require double the number of nurses: one nurse to do the work and another to check the work. Considering the pressure on and

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shortage of human resources, one wonders whether this is the most effective way to save lives. Furthermore, one of the nurses would surely become bored, which is not conducive to good concentration on doing the best work they can.

By no means do we want to argue that errors, mistakes and undesirable outcomes should not be investigated to recognise the “holes” in the system. However, the solution is not always the introduction of a new protocol or checklist.

We strongly believe that the policy of increasing the number of protocols and checklists should be reversed if we want to keep good medical care affordable. An issue that is easily forgotten is that we must be able to keep and attract young talented people. Increasing rigidity of the system is, to say the least, not an incentive to motivate young talents to work in medicine. We argue that protocols and checklists are comparable to medicines: it is the dose that makes poison and the indication always remains pivotal. The dose has now reached the level of poison and the indication is too often wrong.

Jumble of Protocols and Checklists

The purpose of clinical protocols is to translate the best possible up-to-date medical knowledge into practical, clinically applicable instructions. Several studies have shown an improvement in patient outcome with the introduction of a protocol or checklist. Whether a protocol or checklist will introduce an improvement in care largely depends on how good or bad the situation was before the introduction of the protocol. Introduction of a protocol is therefore especially useful in situations of suboptimal circumstances or where inexperienced or less trained healthcare workers are employed. Furthermore, checklists are not universal. Checklists need to be intrinsically supported by staff, based on the local applicability of the checklist and support from the leadership.

Protocols will by definition lead to regression to the mean and mediocrity. Rigid application of protocols will hamper progress and innovation, and protocols are by definition not up-to-date. Finally, many protocols are made on the basis of insufficient scientific data, insufficiently possible external validation of studies or even only on the basis of the judgement of self-proclaimed “experts”. Unfortunately, healthcare managers, “organisations for quality”, supervisory bodies and healthcare insurance companies mandatorily impose the introduction of protocols and checklists for all kinds of aspects of care. The forced introduction on a national level of the Surviving Sepsis Campaign in the United States and in the Netherlands, apart from many other examples, is a tragic example of this. There is insufficient scientific evidence to impose per protocol treatment according to the surviving sepsis guideline in all hospitals and even evidence that it might be harmful (Marik 2016a).

The introduction of protocols with doubtful benefit may lead to waste of time, work and money. The obligatory introduction of the medical emergency team (MET) from the ICU, implementation of all components of the time-out procedure in the operating room, reporting standard screening of feeding

condition in the elderly, and scoring of community-acquired pneumonia, are examples of so-called safety programmes that cost a lot of time and money, but are of doubtful benefit for society and individual patients.

Filling in all kinds of lists is promoted by the introduction of electronic patient record programmes. These have been designed for administrative and financial reasons and not, as one would expect, to improve patient care and help healthcare workers to do their work correctly. It is no surprise that the introduction of such electronic health records has been shown to increase the risk of professional burnout in physicians (Shanafelt et al. 2016).

Treating individual patients optimally will always require aspects of craftsmanship with an academic attitude and thereby individualised treatment. Translating the use of protocols and checklists to another craft, food preparation, might clarify some aspects. Application of protocols only works very well in the fast-food industry. In “restaurants” where no chef is needed the employees are easier to handle by the management of the “restaurant” and can be paid less. Food will always be according to the guidelines and protocols and checklists, but in the end will not fit everybody. Likewise, even if written by a great chef, reading and following the instructions of a cookery book will not match the quality and craft of a real chef.

Proponents of the unrestrained use of protocols and checklists often point to the analogy and similarities between aviation and building construction. We reject that comparison.

Patients are not airplanes and doctors are not pilots. Pilots receive very specific training in general for a single type of airplane. Since every patient is different, it would pose serious problems if doctors were trained like pilots.

Jumble of the Quality Movement

There should be no doubt that doctors and nurses should be accountable to patients and those who pay for them: society. And society is all of us. The healthcare payer has the right to know how their money is spent and where to find quality for the money. However, this is quite difficult to measure and instruments to measure quality are readily available. Nevertheless the “Quality Movement” has triggered a “quality tsunami” where multiple organisations have now become preoccupied with developing quality tools, quality indicators and measuring the “quality of outcomes.” These quality indicators and scorecards are frequently publicly reported and

may influence reimbursement. The scientific validity of most of these quality indicators is highly questionable. It would appear that those who expend the most resources measuring quality provide the worst care (Thomson et al. 2013). The refuge that seems to be chosen now by the administrators and managers can best be described as: “If you can’t measure what is important, you make important what you measure”. So orthopaedic surgeons obligatorily record and report on the rate of reoperations for hip fractures. This of course will result in a figure, but this figure is of course full of confounders and biases

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(eg region, population characteristics, referral pattern, etc.) and nobody can tell what the figure means. A rapid survey among chairmen of university departments of orthopaedics in the Netherlands confirmed this. Nevertheless, whenever criticism is expressed about this obligation the answer is: “It is simply an obligation” or “everybody complies with it”.

Registrations furthermore do not take into account the pollution of data that is not expressed in the data. Subjective data are reduced to figures in a spreadsheet, suggesting that different figures and outcomes can be compared. This becomes most hilarious when comparing opinions. For example, during regularly performed so-called employee satisfaction measurements we add the opinions of ambitious, looking for security, lazy, adventurer, genius, hypochondriac, disappointed (in private life or their career) people, divide this by the number of participants and then we conclude that the satisfaction is 7.3! (We do not take into account the number of employees who for several reasons do not wish to participate). The manager will surely advocate a leadership programme to fulfil the goal for next year: 7.8.

In the U.S. Medicare has embarked on hundreds of “quality initiatives”, and records over 1000 “quality measures” with the purported goal of improving the “quality of care” (Casalino et al. 2016). It has been reported that physicians and their staff spend 15.1 hours per physician per week dealing with external quality measures at an annual cost of over \$40,000 per physician. There is scarce data that these quality measures improve patient outcomes. In 2006 the Centers for Medicare and Medicaid Services (CMS) developed the “Surgical Care Improvement Project” (SCIP), which became federally mandated and linked to pay for performance in 2007 (Joint Commission 2015). SCIP incorporated a number of measures, including glycaemic control and strict timing of prophylactic antibiotics that were required to be performed in every patient undergoing elective surgery. In January 2015 the SCIP project was quietly “retired” (Joint Commission 2015), after it became clear that this very expensive and time-consuming endeavour did not improve patient outcomes (Hawn et al. 2011; Dua et al. 2014; McDonnell et al. 2013). In 2015 CMS adopted the “SEP-1 Early Management Bundle for Severe Sepsis and Septic Shock” for the Hospital Inpatient Quality Reporting Programme. Most alarmingly, it is likely that this “quality” programme will harm patients (Marik and Varon 2016). In the U.S. and progressively in the Netherlands, physician’s medical records are scrutinised by individuals with limited educational training to ensure that all elements of the history and physical examination are documented, no matter how irrelevant. Rather than being a tool to communicate medical information, the medical record is used as a quality indicator and a means to punish physicians for incomplete documentation. And again a new industry is filling this created gap: a “quality company”. Their slogan is: “Let me measure if you have a quality issue, all your colleagues did it already. Indeed you have a problem and we know people who can solve it”.

Jumble of Obligatory Training

Fortunately, the time of “see one, do one, teach one” is over. Many skills can be learned and improved with good training programmes and simulation sessions. This includes not only hard skills and knowledge but also so-called “soft” skills such as advanced life support in a team, team performance, bringing bad news to families and patients, and calling someone to account. Complex tasks with a low incidence cannot be dealt with in a training programme. Intentional publication fraud cannot be prevented with a course on ethics in science and neither will a course, obligatory in the Netherlands, with a duration of more than one week on regulations and organisation of clinical research prevent that. However, these rules mean that professors with many publications in leading journals, and with a research desk to guarantee all responsibilities and compliance with regulations, fail an exam because they do not know by heart how many years all records need to be stocked. The goal of good clinical practice and research will also be missed whenever those who conduct the courses get too much influence on making it an obligation to follow these courses. This again will result in a “course industry” both within and outside the hospital, whose sole purpose is that of self-preservation. In the Netherlands, PhD students in medicine have been guided and supported for decades by established researchers and professors during their PhD study. The study outline and the interpretation of data were discussed almost on a daily basis. They participated in international congresses and presented their data during national and international meetings. However, all of a sudden specific time-consuming courses have been made obligatory for PhD students with no data to support impact on student outcome. Another remarkable obligatory regulation without any supporting data was the introduction of the Basic Qualification for Education (BQE). This training programme consists of 5 full days’ training, 165 hours of study, 90 hours of which are with the help of an assigned mentor. Someone with more than 30 years of educational experience, educational diplomas outside the field of medicine, who has students who value the courses and applaud during presentations and over 260 international presentations is called to follow this obligatory BQE training programme.

A long list can be generated of time-consuming training programmes with concomitant registration obligation, which can be related to demands by health insurance companies, legal authorities and accreditation programmes. It is beyond the scope of this paper to discuss the benefit-time ratios of these programmes, but in general we would challenge those who make these regulations to demonstrate their benefit. The question remains of how to make progress in medicine and how to prevent errors and wrong treatment. We think the key is good training programmes and a culture where healthcare workers continuously give feedback to each other. Medicine has to stay attractive for young people with an academic mindset that is challenged by all the complex problems encountered in

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healthcare. Whatever protocol or checklist, it should be used as a mental support for highly educated professionals and never get the force of law.

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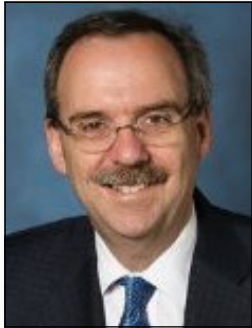
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AUA Member Lee Fleisher Awarded UPenn's Lindback Teaching Award



From: <https://goo.gl/ncWNij>

Lee A. Fleisher, Robert Dunning Dripps Professor of Anesthesia in the Perelman School of Medicine, has taught at Penn since 2004. A physician with “an inherent gift of being able to identify other people’s strengths and what can make them successful in life and work,” Dr. Fleisher “leads by example, exemplifying professionalism in every

way.” A former student, now a colleague, marvels that he has been “the keynote speaker at most of the major meetings I have participated in for the last eight years.” Current and former students and colleagues alike note that he demonstrates on a daily basis that “in order to become a good doctor, one must strive to be a good person.” With teaching evaluations consistently describing him as an educator who “exceeds expectations,” Dr. Fleisher is also a valued department chair and a transformational leader who “truly cares about the professional advancement” of faculty, residents and staff, thus “ensuring the future of the department.” Many make special mention of his “teaching the art and specialty of anesthesia” through “numerous books, papers, talks and lectures” and that, through his “generosity of spirit,” he is nothing less than the “example of the Golden Rule: That we are here to care not just for the patient, but for each other.”

AUA Member Rita Patel to Receive ACGME Award



AUA member **Rita M. Patel, MD** received the Accreditation Council for Graduate Medical Education (ACGME) Parker J. Palmer Courage to Lead Award. The award celebrates Designated Institutional Officials/Associate Deans for Graduate Medical Education (GME) who demonstrate excellence in leading their institution’s graduate medical education enterprise. Dr. Patel was nominated for this award by the GME community at UPMC. The award will be presented formally in March 2017 at the ACGME Annual Educational Meeting. Dr. Patel also received the 2016 Society for Education in Anesthesia (SEA)/Duke Award for Excellence and Innovation in Anesthesia Education. The award was presented to Dr. Patel at the 2016 SEA Fall Meeting in Chicago on Friday, October 21, 2016 in recognition of her significant contributions to advancing anesthesiology education over the course of her career.

From AMA News • December 12, 2016 • LEADING THE NEWS House Passes 21st Century Cures Act

The *Washington Post* (11/30, Johnson) reports the House passed the 21st Century Cures Act with a vote of 392-26 on Wednesday night. The “wide-ranging bill” of almost 1,000 pages aims to expedite the development of new drugs and would increase funding for biomedical research including several research initiatives begun under the Obama Administration.

The *Wall Street Journal* (11/30, Burton, Subscription Publication) reports the bill would increase funding for the Food and Drug Administration by \$500 million and would also provide \$1 billion in funding to address opioid abuse and addiction in the US.

USA Today (11/30, Shesgreen) reports the bill would increase funding for the National Institutes of Health by almost \$4.8 billion over the next decade. The bill would also “strengthen existing laws requiring insurers to cover mental health the same way they cover other medical issues.”

The New York Times (11/30, Steinhauer, Tavernise, Subscription Publication) says Senate passage “appears likely” next week, “even though Senator Elizabeth Warren, Democrat of Massachusetts, has taken to the floor twice to criticize the bill as a windfall for drug companies, with too few safety provisions.”

AUA Member Profile • BIOGRAPHY

Dr. Elizabeth M. Frost, MB. ChB. DRCOG

The Iron Lady of Anesthesia

Compiled by Alan D. Kaye, MD, PhD, Professor, Program Director, and Chairman, Department of Anesthesiology, Louisiana State University Health Sciences Center, New Orleans, Louisiana



Dr. Elizabeth Frost, a Legend in Academic Anesthesiology

Three things come to mind when I think about Dr. Elizabeth Frost, strong, loves to travel, and nobody's fool. Her contributions to the field of anesthesiology and medicine in general, are indisputable. She was one of those intimidating academics that ran our field over many years. Had I not had the fortune to be contacted by her many years ago, I probably would have never had the courage to speak with her and to get to know her as a person. The call came for my first ever Visiting Professor assignment at New York Medical College, in Valhalla, New York, back in September of 1998. As a recently anointed tenured Associate Professor, I had completed a large human



study on the effects of desflurane on intracranial pressure in neurosurgical patients. I was a little concerned because my presentation included a reference from the work by their chairman, Dr. Elizabeth Frost, on the beneficial effects of isoflurane published in a 1984 British Journal of Anaesthesia article. To my surprise, she received me well and offered to take me to a pub, as she told me this was customary, which almost resulted in missing my return flight!

For the next two decades, I would work closely with Elizabeth on many different manuscripts, book projects, and readily seek her advice on potential career opportunities and for resolution of problems within my department, as I rose to the rank of chairman, first at Texas Tech Health Sciences Center in Lubbock and then, recruited back to New Orleans at Louisiana State University Health Sciences Center. For many of us, she is our professional mother. She will tell you many things that are valuable and important and some that are for debate, such as, "Why are you

not wearing a coat or tie at this AUA function?"

It is an honor to summarize her life and honor her lifelong commitment to learning, to education, and professionally, her significant contribution to academic anesthesiology:

Early Life

Dr. Elizabeth Frost was born in Glasgow, Scotland in 1938. During World War II, her father, who was English, returned from the US where he had learned a great deal about radio and TV (his passions). He was about to sign up for the war when he was transferred to Cambridge to work on developing a radio small enough to allow tanks to transmit without stopping. It proved to determine the successful outcome of the El Alamein campaign. Her mother was asked to stay in Scotland to keep his office running during World War II. For the next 2 years, Clyde Bank and Glasgow were bombed. According to diaries kept by her parents, her mother and Elizabeth survived many nights under mattresses on the dining table. By 1941, her mother felt she could go on no longer and she closed their house in Scotland and they started a very long journey by troop train to Cambridge. Then, came the Battle of Britain and Elizabeth spent nights in an underground shelter. Elizabeth was sent to school by the age of 3, to keep her safe, as much as possible. Shortly before the surrender of Japan, she and her family returned to Scotland, a very long journey in a Ford 8 car ... they had to save up for months to get enough petrol for the 400 mile journey.



Elizabeth Frost, sitting in her favorite chair in the hallway of her home

Elizabeth attended school in Scotland. She finished by age 16 and became the first in her family to go to university and attended the faculty of medicine. She finished there by age 22 (a 6 year program) in the < 20% who pass all exams at the first try and within 3% of the top of the graduating class and with 13 first class honors. She then applied for a position at a University of London School but was turned down at the last interview because she was female. Elizabeth then returned to Scotland and did a house officer job in surgery and internal medicine. Then,

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Dr. Elizabeth Frost, with the moon over Casa Maria.

she turned to obstetrics and completed the requirements for a diploma in obstetrics and gynecology from the Royal College (Dip OB RCOG). In the meantime, she took the ECFMG exam to come to the US, but because she had no money, Elizabeth took a locum position in the Orkney Islands to earn money for her passage.

Arrival in the United States and Early Career

Elizabeth came to the US on the Queen Mary, 13 decks below, in 1963. She had \$50, a suitcase, and a promise of a job as resident in medicine at Englewood Hospital, NJ. She met Dr. Virginia Apgar at a music soiree hosted by Dr. Driggs, Elizabeth's mentor at Englewood Hospital. It was Dr Apgar who talked her into a career in anesthesia. Elizabeth attended several clinics at all the NYC hospitals and decided to go to NY Hospital/Cornell for her residency. She married an American during her 2nd year and then began a long struggle to obtain citizenship. Elizabeth was attracted to neuroanesthesia as a resident and fortunately, no one else wanted to cope with Dr. Bronson Ray, the neurosurgeon at her hospital. She finished at NYH, passed the written boards, and also the license for NY state (at the time she was 6 months pregnant). She was hired by Dr. Orkin to go to the Bronx, where she continued her interest in neuroanesthesia and became very interested in head trauma in 1966. At that time, Institutional Review Boards had not been invented and gangs ran rampant in New York.

Soon after arrival at Jacobi hospital, she divided the recovery room into two, using the other side for neuro patients. She studied respiratory changes, cardiovascular effects, drug effects and intracranial pressure (ICP) monitors in many of these patients. With the neurosurgeons, she established an ICP society. Not until the late 1970s was a neuro ICU actually designated. She became an associate member of the American Association of Neurosurgeons, only the 2nd anesthesiologist so honored (Dr. James Michenfelder was the other) and the only woman. She also was concerned about the length of hospital stay and established a preanesthetic clinic in the early 1970s. By seeing patients as outpatients and doing laboratory work, she demonstrated that hospital stays could be decreased by 50-75%. The decrease was so dramatic that Van Etten hospital, part of the Bronx Municipal Hospital Center, had to be closed because of empty beds! Had it not been for her friend at the New York Times who made it a front page issue, in all likelihood, she would have lost her job. During her time at Jacobi, she had



Dr. Elizabeth Frost, just call her "Mum".

4 sons, including twins who were born prematurely with Rh incompatibility, twin-twin transfusion syndrome, and severe respiratory distress. They are now 46. Her husband died of a massive myocardial infarction in 1988 when she was only 49 years old.

The Preanesthetic Assessment Clinic: Early Beginnings in the Bronx

No matter the fact that Elizabeth has published 159 articles, 72 abstracts, 108 book chapters and book projects, > 800 local, regional, national, and international lectures, she will always be linked with the widely acclaimed Preanesthetic Assessment series. In her own words, Elizabeth writes to *Anesthesiology* about the start of the Preanesthetic Assessment series, for which she is known worldwide:

To the Editor:

The article in the August issue of Anesthesiology (2016), "Preoperative Evaluation Clinic Visit is Associated with Decreased Risk of In-Hospital Postoperative Mortality" by Blitz et al¹ brought back memories of my attempts at founding a preanesthetic clinic in the Bronx over 40 years ago.

With the help of an internist, Dr Richard Collens, I started a program at the Bronx Municipal Hospital Center, initially designed to help women. After leaving their children at school, women scheduled for surgery would come to the hospital where I would discuss their anesthesia with them, order appropriate tests and perform a physical examination. Later in the day, they would return to see me as it was convenient for them, and I would discuss the results of their tests and we would schedule them for surgery. Patients quickly realized what they could expect and especially that they did not have to come in ahead of time for tests and moreover, they did not have to spend longer postoperative times in hospital. They actually told their surgeons that they were ready to go home now! Whenever possible, I either anesthetized the patients or followed up with them in the recovery room or at telephoned them at home. The program was expanded to all patient populations within a few weeks. The program was also used by Bronx high school students as a type of elective to observe and follow patients.

Within 3 years, we had gathered data on > 3,500 patients. Inpatient hospital days were reduced in some cases by as much as 7 days. The situation was becoming critical for the hospital and I was summoned to the director, Dr Leonard Piccoli's to his office. He insisted that I close the clinic immediately as the hospital was losing money because there were so many empty beds; he would have to lay off personnel and even close Van Etten hospital (an extension of Jacobi hospital). I was

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Dr. Elizabeth Frost looking at acupuncture ... perhaps another means for pain control

stunned as I believed after hearing so many comments from patients that we were doing a good service. As luck would have it, I shared a common driveway with the editor in chief of the New York Times, Seymour Topping. I took my story to him. He agreed it was a worthwhile program and he sent one of his chief writers, Jane Brodie, to

talk to me. The next day, the article on the clinic was front page news on the New York Times. Certain that my career had come to an end, I waited to hear from the director. Sure enough the next day, I awoke to the radio at 6:30am. Mr Piccoli was explaining about the wonderful new program that had been started in the Bronx. That morning I went to his office and most apologetically told him that I could not see the firing of so many people and I would close the clinic right away. In a panic, he ranted that I could not do that as Herald Rivera, one of the most outspoken journalists in New York as well as several other reporters were coming that day to interview him and see the clinic. Again I expressed my reluctance to cause economic difficulties. He insisted that I must keep the clinic going. Finally I capitulated, but only as long as he gave the Department of Anesthesiology \$10,000/year to run the program. And so the preanesthetic assessment clinic was established in the Bronx and became the precursor for the ambulatory center. MR Topping, who is now 92, still remembers the incident with glee.

A lead article appeared in "Anesthesia and Analgesia" the following year.² The study also merited an editorial comment as I recall.

I do not doubt that mortality is decreased as Dr Blitz and her colleagues show.....shorter stays in hospital are always a good idea. Also, empowering patients to understand what they might expect and involving them in their own care are situations that are invaluable.

— Elizabeth A. M. Frost MB, ChB, DRCOG

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“And thus, based on my experience, I felt that we had much more to learn as a specialty about preanesthetic assessment. I had developed a relationship with the fledgling newspaper, *Anesthesiology News* (then an 8 page monthly publication in 1975)) and had written a series of articles on the history of anesthesia. I met with one of their editors, Mr. Ward Byrne in 1980 and we decided to develop a continuing medical educational series for credit, on preanesthetic assessment.”

Additional Professional Career Highlights

Elizabeth Frost wrote several books on the post anesthesia care unit (PACU) and neuroanesthesia related topics during her time at Albert Einstein and Montefiore Hospital, and also started the Anesthesia News CME series, which has now been ongoing for some 35 years. She was admitted to the AUA in 1980 and was the 4th woman to earn this distinction. She was a very early member of SNAACC and is still the book review editor of JNA.

In 1992, she was appointed Chair at NY Medical College, the 1st woman chair of anesthesia in NY and for that matter, in some 47 states (Dr. Marcelle Willox preceded her in Boston and also Dr. MaryJane Majesko in Baltimore). In the NYSSA, she was scientific and then general chair of the PGA for 7 years and chair of technical exhibitors and business manager (that is obtaining the money to run the PGA) for 19 years.

In 2000, she left NYMC and went to Mt Sinai where she was “farmed out” to the VA system for 4 years. She continued with several CME programs and on the editorial board of several journals. She returned to Mt. Sinai in general anesthesia and preanesthetic assessment for the next 11 years, writing some 6 additional books with junior staff, refining manuscripts for residents, and helping many to gain entry into the academic world. Elizabeth lectures around the world and helps prepare candidates for board certification. She also tries to keep up with 8 grandchildren.



With 7 grandchildren and 2 nephews.

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Answering of questions from Dr. Kaye:

1. Greatest success?
2. Greatest failure?
3. What has Anesthesia meant to your career and life?
4. Outside of Anesthesia interests, elaborate as we discussed?
5. Most interesting thing you have learned in your life?
6. Predictions for the next 50-100 years?

1. **Greatest success?** This is a difficult question as I do not really like to talk about myself that much, yet I have had so many happy and fulfilling times. I became a physician in Glasgow on July 4th 1961. The local newspaper, The Glasgow Herald, announced in separate columns, my graduation, my sister's graduation from high school, and our parents' silver wedding. I took and passed the 5 day examination for MD licensure in New York and the written part of the ABA in July 1967 when I was 6 months pregnant and bleeding from a placenta previa. My son was almost 1 when I passed the oral boards in 1968. I was honored to be elected to the AUA in 1980 and to be appointed professor



Elizabeth smelling the flowers, has recently retired from anesthesia practice, but still has many projects worldwide.

of anesthesiology at the AECOM in 1981. I was the first woman to be appointed chair of an academic department of anesthesiology in New York and only the 3rd in the US. I was the first foreigner to be elected honorary member of the Royal College of Anaesthetists of Thailand in 2011. I was the 2nd anesthesiologist (after Jack Michenfelder) to be made an associate member of the American Association of Neurosurgeons. Maybe my greatest success was seeing all 4 of my sons graduate from college, debt free, and employed as they still are today!

2. **Greatest failure?** Sometimes I think I should have paid more attention to my sons growing up. I spent a lot of time working and probably missed more games than I should. I was hired at New York Medical College mainly to get the residency program back and to make it more of an academic program. Within 2 years we had unconditional 5 year accreditation and we had added a pain fellowship. The hospital and school took away my research space, library, and residency slots. Finally, it was abundantly clear that money was much more important. I had failed to understand.

3. **What has anesthesia meant to my career and life?** From the first day of residency at NYH, I loved going to work. It was fascinating, frightening, all consuming, and so

rewarding. To take someone to the verge of death and bring them back was powerful beyond words. I loved it. I had been a surgical intern and then an OB fellow, but nothing compared to anesthesia. In OB, I remember the midwives yelling... "Come on push, it doesn't hurt that much!" I thought it did and that was one of the reasons why I applied for an anesthesia residency. Later it was gratifying to know that many neurosurgeons would postpone a case if I was not available.

4. **Outside of anesthesia?** I used to play tennis until I broke my rotator cuff. I still enjoy table tennis. I have a passion for antique and flea markets. I love to collect things and have a house that some have said is more museum than house. History, especially of anesthesia is another interest. And above all, I truly enjoy travel.... I have been around the world some 6 times at least.
5. **Most interesting thing I have learned?** Sometimes one thinks that nothing can be changed ... it is final ... can't do any more. And then, sooner or later, there is a cataclysmic reversal and the sun shines again. I have also learned that many things I thought to be self-evident.... 3-4 decades ago (e.g., hyperventilation makes the brain hypoxic) have now been proven by elaborate and expensive studies. Same thing goes for fluid overload. I have recently sent a letter that Evan Karasch has just accepted. I wrote it in response to an article in the recent edition of Anesthesiology that suggests that preanesthesia visits are a good idea and cut down on morbidity.
6. **Predictions 50-100 years in the future?** Anesthesia extenders will take over a lot of practice. Anesthesia will move to off site locations with less and less surgery in the OR. Until we stay with our patients just as surgeons do, we cannot hope to have the latter's respect. Anesthesia will gravitate to an 8-3 job. Academic centers will be reduced to a few medical schools. Funding will be decreased. A few diehards will stay in there and carry us into the next century although I doubt we will have many new drugs. As we all have our pharmacogenetic profile on a bracelet around our wrist, a computer will be able to say which drugs and the dosages and interactions necessary for any particular operation.



Elizabeth spending the day with family (go Mets!).

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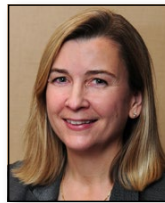
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