virginia society of anesthesiologists

UPDATE

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FALL 2021: **ANESTHESIA SPECIALTIES**

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President's Message

Happy Fall!

By Marie Sankaran-Raval, MD
VCU Health Systems
Richmond, VA

Dr. Marie Sankaran Raval
VSA President

As we embark on the final months of 2021, we should look back on this year and all we have accomplished as Physician Anesthesiologists. We have worked together as a community and spearheaded the war on COVID-19. Many of us have cared for COVID positive patients in operating rooms, emergency rooms, and intensive care units, and I am thankful for all of you. We are not out of the woods yet, but together we are stronger, and ready to face the challenges that lie ahead.

As anesthesiologists, we are so fortunate to practice in a field of medicine that allows us to sub-specialize and use our individual talents to care for our patients to the best of our ability. We have so many different sub-specialties to choose from, including Regional Anesthesia, Cardiac Anesthesia, and my personal favorite: Pediatric Anesthesia. I completed my Pediatric Anesthesia Fellowship at Boston Children's Hospital in 2009 and began practicing at Weill Cornell Medical College before moving to Virginia in 2012. I have enjoyed my time at VCU Health and am excited for the future as the Children's Hospital of Richmond is expected to open in the spring of 2023.

Pediatric Anesthesiology can be traced

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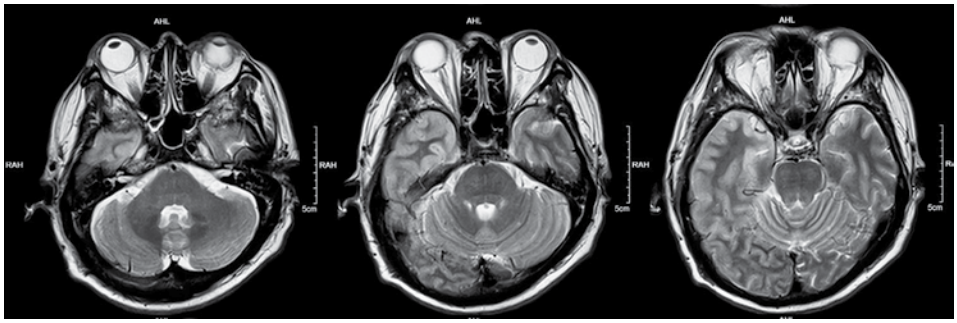
Feature Article

Acute Ischemic Stroke: The Past, the Present and the Future



By Thomas V. Kodankandath, MD
Virginia Tech Carilion School of Medicine

and Dr. Bhiken I. Naik, MBBCh
Associate Professor of Anesthesiology and Neurological Surgery
University of Virginia

In the United States, more than 795,000 people have a stroke annually and it is the leading cause of serious long-term disability.[1]

An estimated $46 billion is spent on stroke related costs, including healthcare service delivery, medications, and loss of productivity.[1] There are multiple demographic factors associated with an increased risk of stroke. These include both race and ethnicity, with African-Americans having nearly twice the risk of first strokes compared to whites and increasing age.[1]

Other factors associated with an increased stroke risk include hypertension, hyperlipidemia, smoking, obesity and diabetes. In the US, one in three adults have at least one of these aforementioned risk factors.[1]

Ischemic strokes, in which blood flow to the brain is compromised, accounts for approximately 85% of all strokes followed by intracerebral hemorrhages, characterized by bleeding into the brain parenchyma, ventricle(s), or both.

Dr. Thomas V. Kodankandath

Dr. Bhiken I. Naik

In acute ischemic stroke (AIS), blood flow decreases below a critical threshold due to occlusion of the cerebral artery and results in neuronal electrical failure with clinical neurological deficits. If flow cannot be restored to the brain parenchyma in a timely manner, irreversible injury occurs. Fortunately, in many patients, collateral blood supply can be sufficient to maintain cellular integrity for a finite period of time. This potentially salvageable brain territory is termed the isch-

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vsa virginia society of anesthesiologists UPDATE

Administrative Office

VSA
2209 Dickens Road
Richmond, VA 23230-2005
Phone: (804) 565-6356
Fax: (804) 282-0090
vsa@societyhq.com • www.vsahq.org

Stewart Hinckley
Executive Director
stewart@societyhq.com

Andrew Mann
Association Executive
andrew@societyhq.com

Newsletter Editors

Editor
Brooke Trainer, MD, FASA
brooke@vsahq.org

Resident Editor
Daniel H. Gouger, MD
Daniel.Gouger@vcuhealth.org

The ***VSA Update*** newsletter is the publication of the Virginia Society of Anesthesiologists, Inc. It is published quarterly. The VSA encourages physicians to submit announcements of changes in professional status including name changes, mergers, retirements, and additions to their groups, as well as notices of illness or death. Anecdotes of experiences with carriers, hospital administration, patient complaints, or risk management issues may be useful to share with your colleagues. Editorial comment in italics may, on occasion, accompany articles. Letters to the editor, news and comments are welcome and should be directed to: Brooke Trainer, MD • brooke@gvsahq.org.

SAVE THE DATES

ANESTHESIOLOGY 2021
October 8-12, 2021
San Diego, CA
https://www.asahq.org/annualmeeting

ANNUAL VSA LUNCH AT ASA
12:00 pm • October 9, 2021
Cardiff Room Marriott Marquis
San Diego, CA

MSV WHITECOATS ON CALL LOBBY DAY
January 25, 2022

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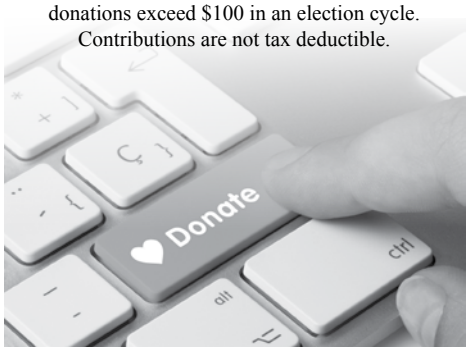

President's Message, *from page 1*

back to Children's Hospital Boston and the arrival of Dr. Robert Moors Smith on January 1, 1946. He originally trained as a surgeon but, while enlisted in the US Army, he became an anesthesiologist. Dr. Smith chaired the Department of Anesthesia from 1946 to 1980, during which time he trained over 800 residents. He championed ideas such as continuous monitoring using a stethoscope attached to a child's chest, the use of neuromuscular blockade for airway securement and performing a leak test to determine the appropriate size of the endotracheal tube, thereby preventing tracheal stenosis.

In 1956, Dr. Smith printed Anesthesia for Infants and Children, which still remains in print today as Smith's Anesthesia for Infants and Children.

In 1965, the American Academy of Pediatrics (AAP) created the Section on Anesthesiology and Pain Medicine (SOA). This was the first group of its kind dedicated to the anesthesia care of children. It was developed by a group of Pediatric anesthesiologists whose primary focus was solving the challenges facing pediatric patients. They made strides in the development of pediatric equipment, techniques and polices. Dr. Smith also served as the first chair of the AAP SOA.

In 1986, the Society of Pediatric Anesthesia (SPA) was founded to continue the advancement of this subspecialty and bring together health professionals with the common interest of pediatric anesthesia. Members of AAP, SOA, and SPA work together with the common mission of improving anesthesia in children, and educating Pediatricians and other healthcare providers. Pediatric Anesthesia has progressed so much in the past two decades that two other societies have been created: the Congenital Cardiac Anesthesia Society (CCAS), and the Society for Pediatric Pain Medicine (SPPM).

It is amazing to see how Pediatric Anesthesiology has evolved over the past seven decades and it will be even more amazing to see the future breakthroughs that will be made in Anesthesiology. I hope you enjoy this issue exploring the various subspecialties of Anesthesia, and I encourage your continued involvement in the VSA, ASA, and your sub-specialty societies. As always, feel free to reach out to me at marie.sankaranraval@vcuhealth.org with any questions or suggestions.

Fellowship-trained Specialists of Anesthesiology: Is it worth it?

By Brooke Trainer, MD, FASA
Editor, VSA Update
Secretary & Alternative Director, VSA


Dr. Brooke Albright-Trainer

Rather than seek employment immediately, an increasing number of graduating anesthesia residents are deciding to pursue fellowship training, to expand their knowledge base, and further focus their expertise in order to better care for complex patients. This sacrifice comes at a great cost, including another year of lost income potential, long work hours resulting in more time spent away from family, and risk of burnout.

When one considers the efforts underway to dismantle physician-led anesthesia care teams threatening the future delivery of anesthesia care, are physician anesthesiologists needlessly sacrificing lifestyle, money, and time away from family by pursuing fellowships?

As someone who chose midcareer to attain additional education and complete a fellowship in critical care medicine, I have experienced first-hand the difficulty in balancing these tough decisions.

As a military physician anesthesiologist, I was actively recruited to work in the ICU and lead Critical Care Air Transport Teams (CCATT), and the military did not require additional fellowship training or certification to care for critical care patients. The lack of a training requirement was more due to resource availability than it was out of necessity.

Additional experience and training certainly would have benefited my military service patients. There were several instances where I felt my level of competence was tested to its limits and I knew that one day, when the opportunity arose, I wanted to pursue additional education and training in critical care medicine.

Currently, there are 16 major fellowship/subspecialty training concentrations for residents to choose from to further their education beyond anesthesia residency. Four anesthesia specialty fellowships are accredited by the Accreditation Council for Graduate Medical Education (ACGME): Pediatric, Cardiac, Pain Management, and Intensive Care Medicine.[i] As of 2020, 1690 completed a residency in Anesthesiology, and 56.9% went on to complete additional training, Though this percentage is up 25.6% from 2007, it has fallen 2.4% since 2017.

Anesthesiologists have an abundance of employment opportunities available to them after graduation from residency, with or without a fellowship. Considering the sacrifices made by a physician resident in training, is the decision to pursue additional fellowship training and education really worth it?

Especially when one considers the shifting political landscape in some states that have passed legislation allowing non-physicians, with far fewer years of education and training, to practice independently and collect comparable salaries to physicians. If legislators, administrators, and even patients, don't mandate physicians have this additional level of training, then why are more than 50% of graduating anesthesiologists still motivated to pursue fellowships after residency, rather than enter the workplace directly.

- Higher pay? Doubtful, especially since compensation for anesthesia services is the same regardless of whether it is provided by a fellowship-trained Physician Anesthesiologist or Nurse Anesthetist, a profession with several fewer years of training and experience. (See Supplementary Data)
- Prestige? Most anesthesia fellowships are officially recognized by additional board certifications, but this does not add nomenclature to titles – fellowship trained anesthesiologists are still just called, "Doctor".
- Opportunity? Institutions will attempt to recruit fellowship trained specialists to care for their highly complex patient populations, such as cardiac and liver transplant surgical patients, but in areas where specialists are scarce or unavailable, experienced general anesthesiologists are used. Some employers will even hire Anesthesiologists without full board certification, usually at a lower income bracket, as long as the physician is in the examination process. The good news for those anesthesia residents who choose not to further specialize and pursue additional training is that 96% successfully found employment after residency.

So why pursue a fellowship? The answer is simple: to better understand how to safely care for and manage complex patients.

Most anesthesiologists understand that the delivery of safe quality anesthesia care is tied directly to education, not payment, autonomy, or prestige. We understand that the more complex the patient, the more education is required to fully understand and grasp the concepts needed to safely care for them. The more you know, the more you realize how much you don't know. And in a specialty such as Anesthesiology or Critical Care, where seconds of decision making can mean the life or death of your patient, there may be no time to second guess your decisions, call for help, or search the literature.

It is for these same reasons the Board of Medicine and national societies mandate physicians attain a minimum number of Continuing Medical Education credits each year, in order to maintain licensure and recertification, respectively. And for those with fellowship training, the assumption for those providers is they will be caring for more complex patient populations, and therefore requirements to maintain certifications are higher.

Education matters. Training matters. The fact is, we don't know what we don't know, until we take the time to learn. Physician anesthesiologists go on to pursue fellowships to attain additional expertise in managing complex patients. This desire is built out of a healthy fear of not wanting to hurt patients in their hands.

Medical school and anesthesia residency has adequately prepared them to safely care for patients, but along the way, some physicians choose to pursue fellowships after experiencing challenges which have inspired them to expand or focus their knowledge in a particular area. Medicine is not just about "getting the job done", it's about "getting the job done right".

Supplementary Data: Differences in Education and Training between Physician Anesthesiologists and CRNAs

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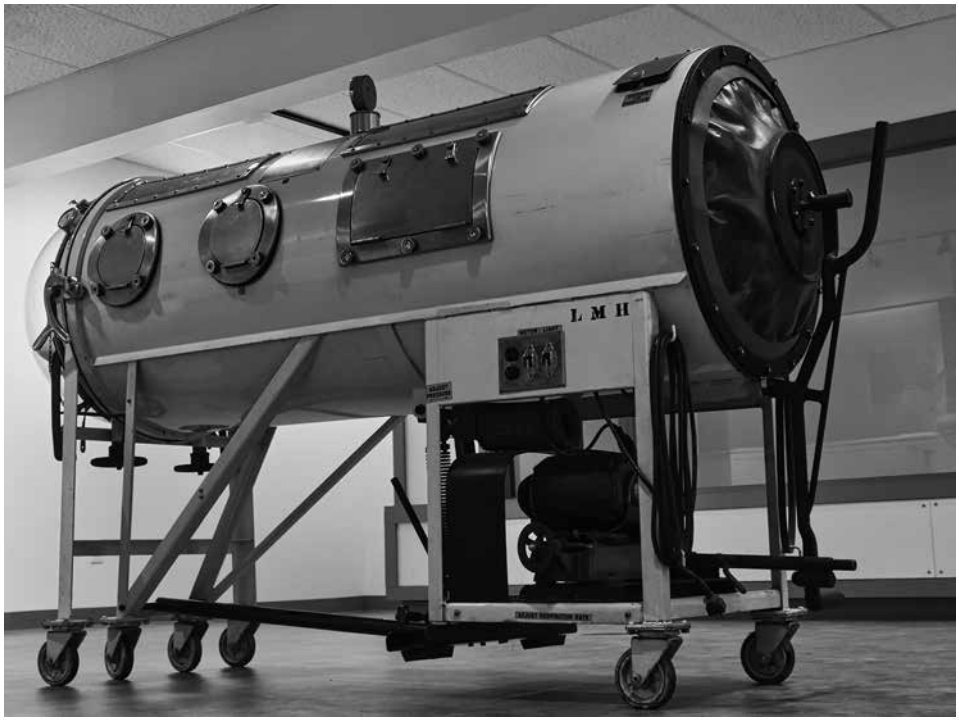
Neurocritical Care: A New ABA Board Certification

By Daniel H. Gouger, MD
Resident Editor, VSA Update Newsletter
CA-3 Anesthesia Resident, VCU Health
Richmond, VA

Dr. Daniel H. Gouger



Jimmy Carter is a peanut farmer and sailor. Decades after his presidency, he was diagnosed with melanoma metastases to the brain and has undergone evacuation of a subdural hematoma. John McCain succumbed to sequelae of a glioblastoma. Woodrow Wilson and many other prominent leaders had devastating strokes, and Franklin Roosevelt had paraplegia from poliomyelitis. Their stories stamp iconic faces on acute, critical neurologic illness.

Ninety-three years have passed since the debut of the Drinker and Shaw tank (also known as the iron lung) for mechanical respiratory support for an eight-year girl with poliomyelitis in 1928 at Boston Children's Hospital. And nearly a century later, with coronavirus variants and ICU bed tallies dominating media outlets, critical care as an interdisciplinary specialty–and inextricably anesthesiology—are at the foreground of international attention.

In October of 2021, the American Board of Anesthesiology will offer certification in Neurocritical Care as a subspecialty separate from Critical Care Medicine. In this VSA Newsletter issue dedicated to subspecialties of anesthesiology, the new ABA certification amidst our current pandemic circumstance, serves as an opportunity to look back at the history of critical care medicine and acute neurologic illness.

The poliomyelitis epidemics that ravaged the world throughout the 1940s and 1950s, catalyzed the evolution of critical care medicine and its subspecialties into an era of technological sophistication and diligent, multi-organ system failure stewardship. The interdisciplinary clinician teams of the poliomyelitis era pioneered advances in medicine that ultimately defined critical care.

These leaders – neuro and trauma surgeons, neurologists, anesthesiologists, specialists in infectious disease and emergency care among others— crafted high acuity hospital wards with one-to-one, specifically trained nurses.

The invention and popularization of the iron lung, along with emergency tracheostomy and bag ventilation with carbon dioxide scavenging through a soda lime canister, decreased the mortality of polio bulbar weakness and respiratory failure from eighty percent to approximately fifty percent.

Across the two decades that followed, these clinical leaders cultivated a deeper understanding of shock and resuscitation with bedside "crash carts," cardiopulmonary resuscitation, and measurement of lactate for a marker of end organ perfusion. They engineered improvements in hemodynamic monitoring with the Swan-Ganz catheter, and early treatment of infection with antibiotics, as well as reliable venous and arterial access and ultrasonography. By 1970, the Society of Critical Care Medicine was founded.

Advancement in managing acute neurologic and neurosurgical illness evolved concurrently alongside other developments in critical care across the 1950s-1990s, with landmark moments like the focused exam of the comatose patient and the Glasgow coma scale; the decompressive craniectomy for traumatic brain injury and ventriculostomies; better understanding of care of spinal cord injuries in a post-war era; treatment of aneurysmal subarachnoid hemorrhage, tetanus, meningitis, stroke, and status epilepticus; and development of guidelines for prognostication and brain death determination.

And while neurocritical care has existed for decades as a subspecialty within neurology and neurosurgery, as well as practiced by anesthesiologists, the Neurocritical Care Society was not founded until 2004.

In 2018, the American Board of Medical Specialties (ABMS) adopted a new Neurocritical Care (NCC) Subspecialty, which allows for uniformity in the training and

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emic penumbra. Restoring blood flow to the ischemic penumbra can prevent irreversible injury and reduces the severity of disability in AIS patients.[2]

The current mainstay treatment for AIS patients is thrombolytic therapy with intravenous tissue-type plasminogen activator (IV tPA), which was approved by the US Food and Drug Administration (FDA) in 1996. IV tPA was approved for treating AIS within three hours of symptom onset. After the initial approval of IV tPA, multiple studies demonstrated the efficacy and safety of extending the treatment window beyond three hours.[3] This has led to extending the time window for IV tPA up to 4.5 hours, in select patients.

Patients that remain ineligible for the extended window include age > 80 years, history of prior stroke and diabetes, any anticoagulant use prior to admission (even if INR <1.7) NIH Stroke Scale >25 and computed tomography (CT) findings involving more than 1/3 of the middle cerebral artery (MCA) territory (as evidenced by hypodensity, sulcal effacement or mass effect estimated by visual inspection or abc/2>100 cc).[4] Even though the US FDA has not approved the expanded time window, professional societies including the American Heart Association/ American Stroke Association (AHA/ASA) and the American Academy of Neurology had issued scientific statements that endorse this expanded time window.

Despite the clinical benefits of IV tPA, distal internal carotid artery, basilar artery and middle cerebral artery occlusions are characterized by modest recanalization rates with IV thrombolysis.[5] Early studies demonstrated an association between favorable clinical outcomes and the degree of vascular recanalization.[6] Therefore, endovascular therapeutic options were investigated to improve recanalization rates.

Five randomized controlled trials published in 2015 established that endovascular mechanical thrombectomy with IV tPA, within six hours of symptom onset significantly reduced disability due to better recanalization rates. Four of the trials were terminated early due to overwhelming treatment benefit. In patients treated with mechanical thrombectomy, the number needed to treat for reduced disability and functional independence were 2.6 and 5 respectively.[5] The current standard of care is to administer IV thrombolysis, if patients are within the window for IV tPA, and then to proceed to mechanical thrombectomy if a large vessel occlusion is present.

> *Although intravenous thrombolytic has been established for the treatment of AIS for the last 20 years, the treatment window of 4.5 hours has limited its widespread use.*

Acute management of AIS has continued to evolve with advancement of imaging capabilities.[7] Salvageable ischemic penumbra versus non-salvageable core infarct can now be identified non-invasively with the use of CT perfusion and Diffusion Magnetic Resonance Imaging (MRI) scans. The identification of salvageable tissue by use of the aforementioned techniques has expanded the treatment window for endovascular therapy to 24 hours while there is promising research demonstrating the benefits of thrombolytic therapy beyond the 4.5 hours window.[2]

Two recent, randomized clinical trials have showed that patients with large vessel occlusion and salvageable brain tissue identified on advanced imaging, who undergo mechanical thrombectomy in treatment windows beyond six hours have better functional outcomes than patients treated with standard medical therapy alone.

The DAWN (Clinical Mismatch in the Triage of Wake Up and Late Presenting Strokes Undergoing Neurointervention with Trevo) and DEFUSE 3 (Endovascular Therapy Following Imaging Evaluation for Ischemic Stroke 3) trials showed beneficial treatment effects for endovascular therapy 16 hours and 24 hours after the last known normal respectively.[8, 9]

In view of these randomized trials, the AHA/ASA has recently updated the management of AIS guidelines and now recommends mechanical thrombectomy up to 24 hours, if patients meet the trial inclusion criteria.[4] Extending the time windows, has led to an increase in patients receiving mechanical thrombectomy with improving functional outcomes among stroke survivors.

Although intravenous thrombolytic has been established for the treatment of AIS for the last 20 years, the treatment window of 4.5 hours has limited its widespread use. "Last known normal" is often used as the time of onset of stroke for patients who are not able to able to give an exact time of onset or who wakes up with symptoms of stroke.

In epidemiological studies, approximately one out of six patients wakes up with symptoms of stroke with an unclear time of onset of symptoms.[10] Advance imaging with MRI has been used as a surrogate for time of onset, specifically a mismatch between diffusion-weighted imaging (DWI) and fluid-attenuated inversion recovery (FLAIR) imaging sequences of MRI.

Studies have demonstrated that an abnormal signal on DWI without a corresponding abnormality on FLAIR correlates with symptom onset within 4.5 hours.[11] The WAKE-UP (MRI-Guided Thrombolysis for Stroke with Unknown Time of Onset) trial was a multicenter, randomized double-blind placebo controlled clinical trial in 8 European countries that investigated patients who were outside the treatment window of 4.5 hours and demonstrated a DWI/FLAIR mismatch.

In patients with AIS with an unknown time of onset and DWI/FLAIR mismatch, IV thrombolysis with alteplase resulted in a significantly better functional outcome, however, there was a higher incidence of intracranial hemorrhages at 90 days compared to the placebo arm.[12] WAKE-UP trial was a landmark trial wherein advances in neuroimaging was used to extend the boundaries for IV tPA. Trials are currently ongoing to further validate the above study results in the US population.

To further improve the efficacy of IV thrombolytic therapy, Tenecteplase, a genetically modified variant of alteplase with great fibrin specificity and administered as a single bolus dose, has been investigated for AIS management. EXTEND-TNK (Tenecteplase versus Alteplase before Thrombectomy for Ischemic Stroke) was a randomized trial that demonstrated a higher incidence of reperfusion and better functional outcome with tenecteplase among AIS patients who were eligible for thrombectomy and within 4.5 hours of symptom onset. Tenecteplase is slowly gaining acceptance as the treatment choice for medical IV thrombolysis.[13]

In summary, stroke care has significantly improved over the past five years, both in

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terms of utilization of advanced neuroimaging and reperfusion therapies. Furthermore, certification of healthcare centers as primary and comprehensive stroke centers has resulted in evidence-based, protocolized care, which has improved functional outcomes after AIS.

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Editor's Message, *from page 4*

Training	Physician Anesthesiologist	Nurse Anesthetist
Undergraduate	4 yr Bachelor of Science or Arts	3-4 yr Bachelor of Nursing
Graduate	4 yr Medical Doctorate (MD/DO)	1 yr ICU/ER Nursing Experience
Anesthesia	4 years (Residency)	2 years (CRNA school)
Specialty	1-3 year (Fellowship in one of sixteen Anesthesia Specialties)	2 years of doctoral training (non-clinical, mostly web-based learning) in either Nursing Practice, Nurse Anesthesia Practice, Philosophy, Education, or Nursing Science*
Total Years	12-15 years	8-9 years

Clear differences in education and training requirements between Anesthesiologists and CRNAs are evident on the respective professions Council of Accreditation websites.

After high school, most anesthesiologists go on to complete a four-year Bachelors of Science degree, a four-year Medical School degree, followed by four years of anesthesia-specific training. Upon graduation, more than half of all graduating anesthesiologists are choosing to pursue additional years of anesthesia specialty training, called fellowships.

On the other hand, most CRNAs are required to complete a three-to-four-year Bachelors of Nursing degree, have at least one year of experience in an acute care setting such as an ICU or ER, followed by two years of anesthesia-specific training.

*Per the Council on Accreditation (COA) of Nurse Anesthesia Educational Programs, all CRNA degree programs must include a doctoral degree by January 1, 2022 for certification eligibility.

The new certification requirements do not specify the type of doctoral degree CRNAs must pursue, but suggest Doctor of Nursing Practice (DNP), Doctor of Nurse Anesthesia Practice (DNAP), Doctor of Philosophy (PhD), Doctor of Education (EdD), and/or Doctor of Nursing Science (DNS) as options. iii

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Weaning Opioids Pursuant to the US Department of Health and Human Services Guidelines, While Properly Integrating Virginia Law

By Jack Craven, MD, JD
CA-1 Anesthesia Resident
VCU Health
Richmond, VA

and Shilen Thakrar, MD
Assistant Professor
Department of Anesthesiology
Division of Acute Pain Service
VCU Health
Richmond, VA

Dr. Jack Craven

Dr. Shilen Thakrar

Introduction

In October of 2020, the Justice Department settled civil and criminal cases against Purdue Pharma and the Sackler family. Within the past few months, multiple attorney generals have settled for their respective state's proceeds from the Purdue Pharma bankruptcy. While it has been a public spectacle to watch the pharmaceutical industry defend against civil and criminal actions, it has done little to assuage physicians who are dealing with legacy opioid patients, resultant regulations, and continuing liability.

Current federal opioid guidance for physicians is complex. The difficulty can be traced to 2016 when Congress passed the Comprehensive Addiction and Recovery Act (CARA), which mandated the CDC to create a set of guidelines for prescribing opiates for chronic pain[1]. The recommendations appeared to dramatically curtail appropriate indications.

That led many physicians to worry they were out of compliance. State and federal officials did little to discount those concerns. Physicians have been sanctioned for overprescribing opiates by medical boards, prosecuted for manslaughter related to prescriptions, and the US Department of Justice has a webpage dedicated to cases against doctors involving narcotics[2]. Given the circumstances, as well as the lack of long-term therapeutic benefit[3], it is not surprising that many physicians quickly attempted to wean their patients.

However, that also resulted in complaints to state medical boards, as patients faced withdrawal symptoms, depression, and even suicide[4]. As a result, the U.S. Department of Health and Human Services (HHS) developed a joint report on best practices for pain management[5], as well as opioid dosage reduction guidelines in 2019[6]. The following article discusses how to integrate the relatively new HHS dosage reduction guidelines within the context of Virginia opioid regulations.

Opioid Prescribing Law in Virginia

The most important distinction is that while Virginia laws are obligatory, the federal guidance is a recommendation. However, federal recommendations are noteworthy, because they are indicative of appropriate practice. That means they can be used by medical boards for licensing actions, as well as by courts, to determine civil and criminal liability.

The chronic opioids laws in Virginia are more straightforward. They envision a comprehensive system for initiation, continuation, and possible cessation of opiates[7]. As a result, the laws merge well with HHS recommendations. In many areas the two sources overlap and complement one another. Below is a discussion of each pertinent section of Virginia Law, followed thereafter by a discussion of the HHS guidance.

18 VAC 85-21-60: Defines how the evaluation of a chronic pain patient should begin and spells out requirements prior to starting opioids. The requirements include: a detailed history and physical, which must document the nature and intensity of the pain, the current and past treatments, underlying or coexisting conditions, the effect of the pain on physical and psychological function, quality of life, activities of daily living, psychiatric history, substance misuse history, and any family history of substance abuse. It also requires a urine drug screen (UDS) or serum medication level, a query of the Prescription Monitoring Program, an assessment of the patient's likelihood of substance misuse, and a request for prior applicable records. Prior to initiating opioid treatment for chronic pain, the practitioner shall discuss with the patient the known risks and benefits of opioid therapy and the responsibilities of the patient during treatment (including proper storage and disposal of medication). The practitioner shall also

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discuss with the patient an exit strategy for the discontinuation of opioids in the event they are not effective.

18 VAC 85-21-70: Requires that non-pharmacologic and non-opioid treatment for pain be given consideration prior to treatment with opioids. It also requires that providers carefully consider and document in the medical record reasons to exceed 50mg Morphine Milliequivalents (MME) per day. Prior to exceeding 120mg MME, the practitioner must document in the medical record the reasonable justification for such doses, or consult with a pain management specialist. There has been some confusion by providers, as this does not explicitly require a pain management consultation. This section also lays out requirements for prescribing naloxone whenever there are risk factors such as prior overdose, substance misuse, doses in excess of 120mg MME per day, or concomitant benzodiazepines. It also requires documentation of the rationale for continuing opioid therapy every three months, limits buprenorphine mono-product prescriptions, places limits on prescribing opioids with benzodiazepines and/or sedatives, and mandates evaluation and referral if opioid use disorder is suspected.

18 VAC 85-21-80: Requires that the provider create a treatment plan specifically stating the measures used to determine progress in treatment, which can include pain relief, physical and psychosocial function, quality of life, and the ability to perform daily activities. The treatment plan should incorporate any further diagnostic testing, treatment modalities, or rehabilitation that may be necessary depending on the etiology of the pain. The prescriber must document in the medical record the presence or absence of any indicators for medication misuse or diversion and should take appropriate action.

18 VAC 85-21-90: Requires written informed consent and agreement prior to the initiation of opioids for chronic pain. The provider should specifically list the risks, benefits, and alternative approaches. The document should describe parameters, including behaviors which will result in referral to a higher level of care, cessation of medication, or dismissal. It must include a notice that the provider will query the Prescription Monitoring Program (PMP) and permission for the practitioner to obtain drug screens and serum medication levels. The agreement should give consent for the practitioner to consult with other prescribers or pharmacists who have provided treatment.

18 VAC 85-21-100: Requires that the practitioner review the course of treatment at least every three months. Continuation of treatment with opioids must be supported by documentation of continued benefit. If the patient's progress is unsatisfactory, the practitioner shall assess the appropriateness of continued use and consider other modalities. This section requires checking the PMP every three months, obtaining a UDS at the initiation of chronic opioids (and at least once a year), and again requires regular evaluation of the patient for opioid use disorder.

Integrating Virginia Law with HHS Dosage Reduction Guidelines

As expected, the guidelines recognize the risks of a rapid opioid taper, and emphasizes the benefit of cautious initiation of chronic opioid therapy. Specifically referenced dangers of a rapid taper include: suicide, psychological distress, and the seeking of illegal opioids. As a result, it is recommended to avoid an abrupt taper unless there are life-threatening signs (such as the possibility of an impending overdose). Similar to Virginia Law, they recommend consideration of non-opioid therapies and have specific circumstances where consideration of tapering is advised, including:

- If pain and functionality do not improve
- When pain improves
- Upon evidence of misuse
- If higher doses do not improve pain level
- Upon patient request
- If side effects diminish quality of life or impair function
- If the patient experiences an overdose or other serious event such as a hospitalization
- If the patient is on benzodiazepines
- If the patient has lung disease, sleep apnea, liver disease, kidney disease, advanced age, or fall risks that increase the likelihood of adverse events

* Each of the above factors should arguably be documented pursuant to Virginia law as well

The guidance to consider a taper, begins with a risk-benefit analysis. HHS specifically recognize studies which have tied tapers to improvements in function, sleep, anxiety, and mood without worsening pain[8,9].

They also recognize the side-effects of tapering include: hyperalgesia, depression, insomnia, anxiety, and withdrawal. It is recommended to balance each patient's individual risks and benefits when creating a plan. Similar to Virginia Law, HHS recommends to continue the analysis throughout treatment, and to document any justification for higher doses.

In order to comply with 18 VAC 85-21-60, Physicians should have an exit strategy for tapering chronic opioids from the outset of therapy. HHS advises to avoid insisting on a taper or discontinuation, especially when the benefits of therapy outweigh the risks. Collaborative treatment (and tapering) is the cornerstone of HHS recommendations, and sometimes waiting for buy-in is the best option.

HHS warns that terminating a patient's treatment puts them at risk of adverse events, and misses opportunities to provide intervention. They recommend considering predisposing factors for poor outcomes, such as PTSD, depression, anxiety, and prior suicide attempts. Mental health should be optimized before attempting a taper, and patients should be referred to appropriate resources. Patients should be reassured throughout the process, and more frequent follow-up may be indicated for support.

Special consideration should be given to pregnant patients. They are at increased risk of spontaneous abortion or preterm labor, and therefore likely to benefit from medication assisted treatment rather than detoxification.

Slower tapers of 10% or less are recommended as being better tolerated, especially for patients who have been treated on opioids for over a year. Faster tapers may be appropriate for patients who have been treated less than a year. The guidance specifically recognizes the benefit of pausing tapers, and considers them successful if patients are generally making progress toward lower doses. Once at the smallest available dose, HHS recommends increasing the interval between doses. It may be beneficial to in-

Continued on page 10

clude illustrative tapering information in the consent and agreement required by Virginia law (to set expectations).

HHS guidance recognizes that withdrawal symptoms are a hindrance to tapering, and therefore the schedule of tapers may need to be adjusted or paused. For specific symptoms such as sweating or tachycardia-alpha-2 agonists are discussed, whereas over-the-counter agents are mentioned for muscle aches and GI symptoms.

If patients fail to make progress despite genuine intentions, it is recommended to screen for opioid use disorder. If present, it is an indication for medication assisted therapy (buprenorphine). If patients fail to wean, even though pain and function are worsening, it may also be an indication for medication assisted therapy. As discussed above, Virginia Law also requires regular evaluation of the patient for opioid use disorder and referral if suspected.

Conclusion

There are many areas of overlap between Virginia law and HHS recommendations. Ultimately, Virginia's requirement to carefully prescribe opioids, limit daily doses, document metrics of success, and to regularly assess the benefits and risks of opioid therapy integrate well with HHS recommendations. Moreover, Virginia's requirement to have a chronic opioid exit strategy integrates well with tapering guidelines.

The landscape of opioid regulation will continue to evolve. However, by specifically complying with laws and integrating best available evidence practitioners can work to avoid both complaints to medical boards as well as limit civil (and even criminal) liability.

The intersection between treatment and compliance is increasingly difficult to navigate without a thorough understanding of legislation. Therefore, physicians should consider consulting a knowledgeable attorney especially if they are unsure how to comply with requirements, if they have a significant number of chronic opioid patients, or if they are developing guidelines and consent forms for chronic opioid therapy.

Author Disclaimer: Although every attempt was made to verify the veracity of the information in this article, it is not intended to provide legal advice for any specific situations, and practitioners should seek legal assistance if they are unsure if they are complying with current law.

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skill sets of neuro-intensivists through ACGME-accredited fellowship training.

For acute care providers interested in honing their fundamental acute neurologic management skills, the Neurocritical care society, in 2012, also launched the Emergency Neurologic Life Support training program.

In its current practice, Neurocritical Care primarily focuses on management of elevated intracranial pressure, care and examination of the comatose patient, treatment of neuromuscular respiratory failure, management of acute stroke, intracranial hemorrhage, and traumatic brain injury, as well as management of status epilepticus and other acute neurologic conditions, complications, and the resultant secondary neuronal stress. As a specialty, it is distinct because of its focus on neurologic and neurosurgical morbidity that affects the mind and physical functioning.

Practicing during a viral respiratory pandemic is harrowing for all of us as anesthesiologists. However, reflecting on the progress modern medicine has made in critical care over a century, in part due to the work of anesthesiologists and our other specialty colleagues, is a point of pride, camaraderie, and realization that we watch history unfold daily in real time.

For more information about the Neurocritical Care Certifying Exam through the ABA, visit www.theaba.org.

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Daniel H. Gouger, MD, is the Resident Editor of the VSA Update Newsletter and a current CA3 in the Department of Anesthesiology at VCU Health. After graduation, he will be completing a combined fellowship track at Johns Hopkins School of Medicine in Neurocritical Care, Neuro-anesthesiology, and Critical Care Medicine.

The Arts

Tetralogy of Fallot - Hypothermic Anesthesia at Johns Hopkins Hospital - Baltimore, MD - 1973

By Jaikumar Rangappa MD, DABA, FACA

LTC Retired US Army, Desert Storm Veteran • Hampton, VA – May 16, 2021

Tetralogy of Fallot-congenital heart disease
At Johns Hopkins Blalock/Taussig did ease
With operation the blue babies did survive
Gained a normal healthy pink color to live.

Working as the senior anesthesia resident
At Johns Hopkins anesthesia department
Did hypothermic anesthesia for blue baby
With Dr. Tommy Tong in year 19 seventy 3.

Brought to OR four hours after delivery
A Blue baby was scheduled for surgery
Inhalation anesthesia given to the baby
Intubated, cut downs, readied for surgery.

Wrapped in plastic baby put in ice bath
Till body temperature was 15 C degree
Laid on surgical table without any cloth
Prepared by techs for open heart surgery.

Dr. Jaikumar Rangappa

Surgeons connected to heart lung machine
To freeze baby to a temperature never seen
Ventilation and blood circulation stopped
Bloodless surgery for 60 minutes clocked.

After surgery circulation, ventilation begun
With only O2, baby warmed to a Pink One
Paralyzed baby was reversed to breathe
Opening eyes spit ETT between no teeth.

Pink baby howled loud with hunger cry
As the OR team screamed with their joy
Of an operation success & new history
At the John Hopkins with a new memory.

With the new pink baby wheeled to ICU
Happy parents & OR team came through!

The Youth Epidemic of Vaping and E-Cigarette Use Among Adolescents: A Call to Action

By Debnath Chatterjee, MD, FAAP, FASA
Associate Professor of Anesthesiology, Children's Hospital Colorado/University of Colorado School of Medicine
Aurora, CO

Dr. Debnath Chatterjee, MD, FAAP, FASA

Introduction

Electronic cigarettes or e-cigarettes are the most commonly used tobacco products among youth in the United States.[1]

They are battery-operated handheld devices that produce an aerosol by heating a liquid, usually containing nicotine, flavoring chemicals, and other additives. They are known by many different names such as e-cigs, e-cigars, e-hookahs, mods (ability to modify the device), vape pens, ciga-likes, pod-mods, electronic nicotine delivery systems (ENDS), etc.

Using an e-cigarette is referred to as "vaping" or "juuling", since JUUL is a popular brand of e-cigarettes in the U.S. with about a 75% market share. These products were developed in China in 2003 and introduced to the U.S. market in 2007.

E-cigarette design and technology are rapidly evolving, and they are available in several shapes and sizes, often resembling common household items such as pens, flashlights, remote controls, inhalers, and USB sticks, which are easily concealable.

The Center for Disease Control recently published a products visual dictionary that illustrates the four different generations of e-cigarette devices and the common hacks that are used while using these products.[2]

E-cigarettes usually have four parts: a cartridge or reservoir that contains the flavored nicotine solution (e-liquid or e-juice), an atomizer or heating element that provides the necessary heat for aerosolization, a rechargeable lithium-ion battery that provides enough current to heat the atomizer to 400 degrees Fahrenheit within seconds, and a power button or sensor that turns on the device.[2]

When a user draws a breath from the device, a flow sensor activates the atomizer, which draws the solution from the reservoir and heats it, creating an aerosol that the user inhales. Unlike traditional cigarettes that burn tobacco and generate smoke, e-cigarettes heat the e-liquid to produce an aerosol, although they are often incorrectly referred to as a harmless vapor.[1] The e-liquid contains variable concentrations of nicotine ranging from none (nicotine-free) to 36 mg/mL, though it can be much higher and inconsistently reported.

In 2015, JUUL introduced a 5% nicotine salt solution (59 mg/mL in 0.7 mL pod), and they claim that it releases a similar amount of nicotine to a pack of 20 cigarettes.[3] Nicotine is available in different pH-different forms.

The more alkaline, free-base nicotine in traditional cigarettes is relatively bitter and is harsher on the throat. Newer e-liquids contain nicotine salts (for example, nicotine combined with benzoic acid to make it more acidic), which are less bitter and less harsh, allowing much higher nicotine levels and efficient delivery, with less irritation.[3] In addition, e-liquids contain a vehicle solution (propylene glycol, glycerol, or ethylene glycol), artificial flavorings, and heavy metals such as tin, lead, nickel, chromium, manganese, and arsenic.

There are more than 7,700 unique flavors of e-liquid solutions on the market.[4] In addition to traditional tobacco flavors (menthol, Cubano, Carolina bold, classic tobacco, tobacco chill, etc.), there are several youth-oriented flavors that can be divided into three groups: desserts (gummies, cookie, custard, pie, butterscotch, sorbet, Taffy, mocha, etc.), fruity flavors (mango, strawberry, raspberry, kiwi, passion fruit, peach, lime, etc.), and arbitrary descriptions (unicorn, God's gift, mtn doo, antidote, pinkie, dragon, etc.).[3] Tetrahydrocannabinol (THC) or cannabinoid oils are also commonly used in e-liquids.

Trends in E-Cigarette Use Among Adolescents

Since 2011, e-cigarette use has increased dramatically among the youth in the U.S. The National Youth Tobacco Survey is an annual cross-sectional, school-based, self-administered survey of U.S. middle and high-school students. In 2020, 19.6% of high school students (3.02 million) and 4.7% of middle school students (550,000) reported current e-cigarette use.[5]

One in five high school students and one in 20 middle school students currently use e-cigarettes. The numbers were even higher in 2019, with 27.5% of high school students and 10.5% of middle school students reporting e-cigarette use.

In 2020, 38.9% of high school students and 20% of middle school students reported frequent use, which was defined as more than 20 days per month. Additionally, 22.5% of high school students and 9.4% of

Continued on page 13

middle school students reported daily use. Most of these students used prefilled pods or cartridges and flavored e-cigarettes.[5] In two other nationally representative longitudinal samples of adolescents and younger adults, JUUL use increased significantly among every age group and was highest among those aged 18 to 24 years.[6]

Detrimental Health Effects of E-Cigarettes

Although e-cigarette aerosol contains lower levels of toxicants than the smoke from combustible tobacco cigarettes, the use of e-cigarettes has been linked to several adverse effects, especially among adolescents.[7]

Nicotine in e-cigarettes is highly addictive. Nicotine exposure during adolescence may preferentially interfere with limbic circuitry, producing enhanced vulnerability to nicotine addiction, increased impulsivity, and mood disorders.[8] It also impacts learning, attention, and memory. E-cigarette use normalizes smoking behavior and predisposes adolescents and young adults to smoke traditional cigarettes.

In a recent study, adolescents and young adults who smoked e-cigarettes had seven times higher odds of smoking traditional cigarettes a year later compared with those who never used e-cigarettes.[9]

Several harmful toxicants and carcinogens have been found in e-cigarette emissions, including polycyclic aromatic hydrocarbons, volatile organic compounds, ultrafine particles, and heavy metals.[1,7] Many of the flavorings contain aldehydes, which are known respiratory irritants. It is not surprising that adolescent e-cigarette users are at an increased risk of cough, wheezing, and asthma exacerbations.

There has also been a substantial increase in unintentional nicotine exposures and poisonings from e-cigarettes with more than 8200 cases among children < 6 years of age from 2012-2017, primarily from accidental inhalation, ingestion, eye, and skin exposures.[10]

Initially described in the summer of 2019, e-cigarette or vaping product use associated lung injury (EVALI) is an acute or subacute respiratory illness that can be severe and life-threatening.[11]

As of February 2020, more than 2800 cases of EVALI and 68 deaths have been reported to the CDC.[12] Approximately two-thirds of those patients are male, and 75% of the patients are under 35 years of age. While the exact pathogenesis is not known, EVALI is a form of acute lung injury with acute fibrinous pneumonitis, diffuse alveolar damage, or organizing pneumonia and is accompanied by bronchiolitis.[13] No infectious etiology has been identified.

Initially described in the summer of 2019, e-cigarette or vaping product use associated lung injury (EVALI) is an acute or subacute respiratory illness that can be severe and life-threatening.

More than 80% of patients with EVALI reported using e-cigarettes with products containing THC.[12] Bronchioalveolar lavage (BAL) samples have found THC and vitamin E acetate in most affected patients.[14]

In addition, the majority of the affected patients used products obtained off the street or from other informal sources.[12] The clinical presentation of EVALI includes respiratory symptoms (dyspnea, cough, chest pain, hemoptysis), constitutional symptoms (fever, chills), and gastrointestinal symptoms (nausea, vomiting, abdominal pain).[11]

Chest radiographs show bilateral diffuse hazy or consolidative lung opacities. Flexible bronchoscopy with BAL is typically reserved for patients with progressive or severe symptoms.

The treatment of EVALI is primarily supportive, with oxygen, empiric antibiotics, and possibly, a short course of systemic glucocorticoids for patients with progressively worsening hypoxemia. In the largest series of 98 patients with EVALI, 26% of the patients required intubation and mechanical ventilation.[11]

A review of the intra- and post-operative anesthesia records of nine adolescents with EVALI who underwent flexible bronchoscopy revealed substantial airway reactivity, with severe coughing spells and prolonged desaturation. Four patients remained intubated postoperatively.[15]

Unfortunately, the CDC has stopped tracking EVALI cases since the outbreak of the coronavirus disease (COVID)-19 pandemic. A consensus statement on the perioperative implications of e-cigarette use in adolescents was published recently.[16]

Is there an association between smoking, vaping, and the COVID-19 pandemic? A recent online survey reported that COVID-19 diagnosis was five times more likely among e-cigarette users and seven times more likely among adolescents and young adults who smoked both traditional and e-cigarettes.[17]

It is well known that smoking can upregulate angiotensin-converting enzyme-2 (ACE2) receptor, an adhesion molecule for the severe acute respiratory syndrome-coronavirus-2 virus.[18]

Our Role in This Youth Epidemic

As anesthesiologists, we have an important role to play in this public health crisis. The perioperative environment provides a "teachable moment" for smoking abstinence.[19]

Routine screening for e-cigarette and tobacco use must be a part of the preoperative history for adolescents and adults. In 2011, the American Academy of Pediatrics (AAP) recommended the universal adoption of a process called screening, brief intervention, and referral to treatment (SBIRT) in pediatric primary care settings.[20] It includes screening using a validated tool such as the screening to brief intervention (S2BI) questionnaire, brief intervention that focuses on increasing insight and awareness, followed by referral to treatment (See Figure 1).

All of us must be asking these questions confidentially, without the parent or caregiver in the room. Unfortunately, this is not common practice. We must engage honestly and listen, not ignore, brush off, or lecture them. These children and adolescents are our future.

Let's do our bit.

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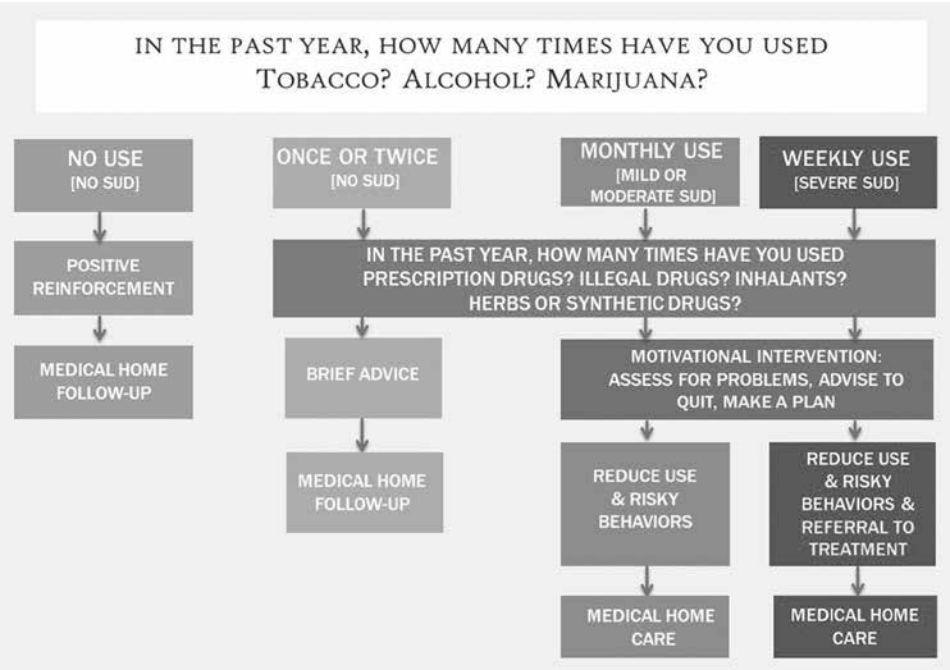

Figure 1: Screening, brief intervention, and referral to treatment using a validated Screening to Brief Intervention (S2BI) questionnaire. S. Levy, S Shirer. 2014. Boston, MA. Reprinted under Creative Commons Attribution-Noncommercial 4.0 International license. (SUD = substance use disorder)

> *As anesthesiologists, we have an important role to play in this public health crisis. The perioperative environment provides a "teachable moment" for smoking abstinence.*

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Enhanced Recovery After Cardiac Surgery (ERACS): An Overview of Key Concepts

By Darian Rice, MD, PhD, FASA, FASE
Cardiac Anesthesiologist,
Associate Professor of Anesthesiology
Department of Anesthesiology, McGuire VA Medical Center, Richmond, VA
and Department of Anesthesiology, University of Virginia, Charlottesville, VA

The practice of anesthesiology is rapidly evolving, from a mindset primarily focused on intraoperative care, to a more comprehensive approach to perioperative patient optimization. Over the past several years, it has become clear that preoperative, intraoperative and post-operative clinical practices have the potential to help minimize risks and optimize patient outcomes.[1-3]

Despite practice guidelines that currently exist for many aspects of cardiac surgical care, it is estimated that only half of patients actually receive these Enhanced Recovery after Cardiac Surgery (ERACS) best practices. The goal of this brief review and update is to increase awareness of the current literature and summarize current clinical practice guidelines. The intent of ERACS is not to create a one-size-fits-all recipe for patient care, but rather to provide evidence-based considerations to help optimize patient outcomes.

The areas of cardiac surgery that have been identified as potential targets for clinical optimization include, but are not limited to:

1. Preoperative nutrition/hydration
2. Atrial fibrillation risk reduction
3. Pre-emptive multimodal analgesia
4. Neuroprotection
5. Delirium risk reduction
6. Infection prevention
7. Lung protection/ventilation management
8. Blood conservation
9. Myocardial protection
10. Renal protection
11. Anticoagulation and Reversal
12. Fluid management
13. Fast-tracking
14. SIRS management
15. Vasoplegia management
16. Deep Hypothermic Circulatory Arrest management
17. Future: Genomic-based individualized patient considerations


Dr. Darian Rice

A comprehensive review of these clinical targets is beyond the scope of this article, but a few key concepts are briefly outlined below:

Several areas have been identified that have the potential to be optimized prior to surgery.

1. Nutrition/Hydration: Perioperative nutritional support has been advocated to help mitigate the hypermetabolic/catabolic state associated with major surgical procedures. Ideally patients should be nutritionally optimized prior to surgery and this concept of "pre-habilitation" is slowly gaining recognition but has often been difficult to implement. Currently, oral hydration with a sugary, non-caffeinated, non-alcoholic beverage two hours prior to surgery, has become a standard part of ERAS recommendations. In addition, post-operative enteral or parenteral feeding should begin within 24-48 hours of surgery, or as soon as practical.4-7

2. Post-Operative Atrial Fibrillation (POAF) risk reduction: Several interventions have been shown to reduce the incidence of post-operative atrial fibrillation. In addition to beta blockers, maintenance of normal serum electrolytes, particularly magnesium, has proven to be beneficial. Amiodarone is also effective. Time permitting, Amiodarone may be loaded preoperatively 400 mg PO bid for 5 days leading up to surgery. Otherwise, it may be initiated intraoperatively IV or post-operatively IV/PO based on patient hemodynamic stability. Amiodarone should be avoided or used with caution in patients with chronic atrial fibrillation, myocardial infarction less than 4 weeks before surgery, a heart rate of less than 60 beats per min, advanced heart block, an implantable pacer/defibrillator, a history of amiodarone toxicity, treatment with certain interacting drugs (cimetidine, phenytoin, cholestyramine, cyclosporin, or class I and III antiarrhythmic drugs), untreated thyroid disease, and/or elevated serum aspartate aminotransferase or alanine aminotransferase concentrations. If placed in the OR, epicardial atrial pacing may also be protective against POAF.8-9

3. Multimodal Analgesia/Opioid Reduction: Minimizing the use of opioids and including non-opioid agents such as acetaminophen, gabapentin, ketamine, etc. may reduce overall post-operative pain and the risk of developing chronic pain. Acetaminophen 975 mg or 1000 mg PO/IV (unless significant hepatic dysfunction) is commonly given prior to surgery and then continued intra and post-operatively for 48-72 hours. Other agents such as Gabapentin (adjusted for age and renal function), ketamine and/or methadone may also be of benefit. Newer considerations also include regional techniques such as erector spinae, pectoralis, serratus anterior, transverse thoracic muscle, and pecto-intercostal fascial plane blocks, and have also been shown to reduce post-operative pain and opioid requirement. Alternatively, the sternal incision and chest tube sites may be infiltrated with Exparel liposomal bupivacaine or regular plain bupivacaine.10

Once in the operative environment, several interventions may be initiated which may continue to have a positive impact on recovery in the intensive care unit postoperatively.

1. Neuroprotection: Optimizing cerebral perfusion during cardiopulmonary bypass has been an area of ongoing debate. Common practice has been for the perfusionist to target a MAP of 60-65 mmHg, with the assumption that adequate cerebral perfusion will be maintained via autoregulatory mecha-

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Legislative Update

By Lauren Schmitt
Commonwealth Strategy Group

It's been a busy summer in Richmond! The legislature convened for a special session in early August to allocate $4.3 billion in federal COVID relief funding and appoint new judges to the Court of Appeals. The Governor's office worked with leadership from both the House of Delegates and Senate to negotiate the budget before session began. There were several attempts by legislators to make amendments, but very few were successful.

Continuing Education Update

The Board of Medicine has made a recommendation to introduce legislation in 2022 around continuing education requirements for physicians. Currently, physicians are mandated by law to complete a continuing education course on safe opioid prescribing. This law is set to expire next summer. The Board of Medicine is recommending not to renew this requirement and instead, pass a law that gives the Board an optional two hours of Continuing Education to require on a topic they determine to be relevant and necessary. The Board of Pharmacy currently has this authority.

Nurse Practitioner Update

The Department of Health Professions released their report examining nurse practitioner autonomous practice in Virginia since the law passed in 2018. The report is a result of the 2018 legislation that established nurse practitioner autonomous practice after five years of experience. Per the 2018 legislation, the report includes, "data on the implementation of this act, including the number of nurse practitioners who have been authorized to practice without a practice agreement, the geographic, and specialty areas in which nurse practitioners are practicing without a practice agreement, and any complaints or disciplinary actions taken against such nurse practitioners, along with any recommended modifications to the requirements of this act, including any modifications to the clinical experience requirements for practicing without a practice agreement."

During the 2021 legislative session, HB 793 was passed that changed the requirement to only two years of clinical experience (mirroring the Governor's Executive Order that did the same thing during the pandemic). However, the legislation requires the legislature to pass the bill again in 2022 to make it permanent. The idea was that the DHP report will have been issued by then and legislators can use that information, as well as recommendations by the Boards of Nursing and Medicine, to determine the next step.

The Joint Boards of Nursing and Medicine were presented with preliminary data for the report, which showed that NP complaints and discipline rates were similar to that of physicians. The Joint Boards also were shown a breakdown of where autonomous NPs work across Virginia. The map shows that autonomous practicing NPs do not generally work in underserved parts of Virginia, with the overwhelming majority of NPs working in urban centers.

The Board of Nursing made several recommendations, including that the law be permanently changed to allow NPs to practice autonomously after only two years. The Board of Medicine recommended the requirement remain at the five years that the 2018 legislation included. The House of Medicine will advocate to keep it at five years during the 2022 legislative session.

Upcoming Elections

This November is a big election day for Virginia. The entire House of Delegates is up for re-election and we will elect a new Governor, Lieutenant Governor and Attorney General. The Republican nominees for statewide offices are as follows: Glenn Youngkin for Governor, former Delegate Winsome Sears for Lieutenant Governor, and Delegate Jason Miyares for Attorney General. The Democratic statewide candidates are as follows: former Governor Terry McAuliffe for Governor, Delegate Hala Ayala for Lieutenant Governor, and current Attorney General Mark Herring for Attorney General.

VaSAPAC

As mentioned above, this is a critical election year in Virginia and a strong and robust PAC is crucial to our advocacy success. Contributions to the PAC will help raise the visibility and profile of anesthesiologists, connect us to new and returning legislators, and continue to build productive relationships with key General Assembly members. As always, we continue to support members of the legislature who care about issues affecting our profession and our patients. We support both parties and their leadership through individual legislator and caucus events. Please make your contribution to the VaSAPAC today! https://www2.vsahq.org/forms/VaSAPAC.iphtml

Delegate Karrie Delaney, District 67

Over the past year and a half our Commonwealth and our country has grappled with unprecedented challenges caused by the COVID-19 pandemic. But through it all, our frontline workers and healthcare heroes have stepped up to protect us - we are all so grateful for your work in testing, treating patients, and our Commonwealth's vaccination efforts.

As we continue to rebuild, your voices will be crucial to ensuring that we allocate resources where they are most urgently needed. Before our recent Special Session to allocate federal funding from the American Rescue Plan Act, I heard from many of my constituents about their top funding priorities. Contacting your legislators is an incredibly important part of our legislative process, and I encourage you to engage early and often with us.

The House of Delegates met in person for our Special Session, making it the first time in 17 months we had met in the House Chamber. It was a delight to see my colleagues face-to-face again and engage with community members as we deliberated on the state's updated budget and appointments of eight judges to the expanded Court of Appeals.

During this Special Session, the General Assembly was presented with a unique opportunity to invest in our Commonwealth with $4.3 billion in federal relief funds. One of the key goals for these funds was to shore up our public health and healthcare systems to ensure that our medical infrastructure is up-to-date and continues to deliver the highest quality care to patients.

One of the top priorities for the General Assembly was to allocate a significant amount of money to substance abuse treatment and prevention and our mental health systems. The $238 million included in the version of the budget signed by the Governor will provide critical support to those struggling with mental health or substance use and provide needed funds for suicide and substance abuse prevention over coming years.

Delegate Karrie Delaney

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The pandemic has exponentially increased demands for these services, and I am proud to have supported a budget that places such high priority on mental healthcare and substance use treatment.

Another key area of investment is in our public health systems. The General Assembly has allocated $30 million for facility upgrades, $10 million for an Electronic Health Records system, and more improvements for our local health departments that have been on the frontlines of providing timely and accurate information to residents during the pandemic. Importantly, we have also included $20 million to provide targeted community outreach about the COVID-19 vaccine in hard-to-reach communities.

Of course, the pandemic has shone a light on issues that remain throughout our Commonwealth. As a member of the House's Health, Welfare, and Institutions Committee, I am particularly eager to get to work on continually improving Virginia's healthcare system.

How can we lead in return to care efforts, after many people put off necessary check-ups and routine tests? What can we do to ensure the highest quality long-term care for our seniors? And how can we continue to address the ongoing challenges that face our behavioral health system and ensure that everyone has access to quality mental health and substance abuse services?

As we move towards the 2022 Regular Session, I hope to hear from you on how we can continue to provide world-class healthcare to our neighbors.

Our recent Special Session was an incredibly productive and important step forward for our Commonwealth. The General Assembly has kept its promises to support our health, our students and educators, our small businesses, and our working families. Although we continue to face challenges, I know that we are on a strong path forward.

I look forward to engaging with you to craft policy that continues to make Virginia a wonderful place to live, work, and raise a family.

Contact Delegate Delaney:
PO Box 231023 Centreville, VA 20120
District Office Phone Number:
703-996-9415

Impact of Regional Anesthesia on Inpatient Management of Upper Extremity Burn Injuries

Yvonne Nguyen*+, Emily Andersen*^, Andrew Nguyen#, Lazar Jankovic#, Michael Buxhoeveden+, Sabrina Dhillon+, Bryant Tran+, Michael Feldman^

**Co-first authors*

+Department of Anesthesiology, Virginia Commonwealth University Health Systems; ^ Department of Plastic Surgery, Virginia Commonwealth University Health Systems; # Virginia Commonwealth University School of Medicine

Dr. Yvonne Nguyen

Dr. Emily Andersen

Introduction

Over 400,000 burn injuries present at the emergency department each year [1]. Many of these patients require surgical intervention and multiple painful wound dressing changes during their hospitalization. They experience significant acute pain commonly resulting in opioid tolerance and often develop chronic pain issues after hospitalization [2].

Regional anesthesia has emerged as an important adjunct for pain management in patients undergoing upper extremity surgery, and studies show that regional anesthesia provides opportunities to avoid general anesthesia, reduce hospital length of stay, and improve pain management [3,4].

As research in perioperative pain management for burn injuries grows, more emphasis has been placed on a multimodal approach to pain [5]. Peripheral nerve blocks have been increasingly used as a means of pain management in burn surgery, but information is limited on the efficacy of peripheral nerve blocks specifically for upper extremity burn injuries to manage acute pain for reduced hospital stays and improved patient outcomes.

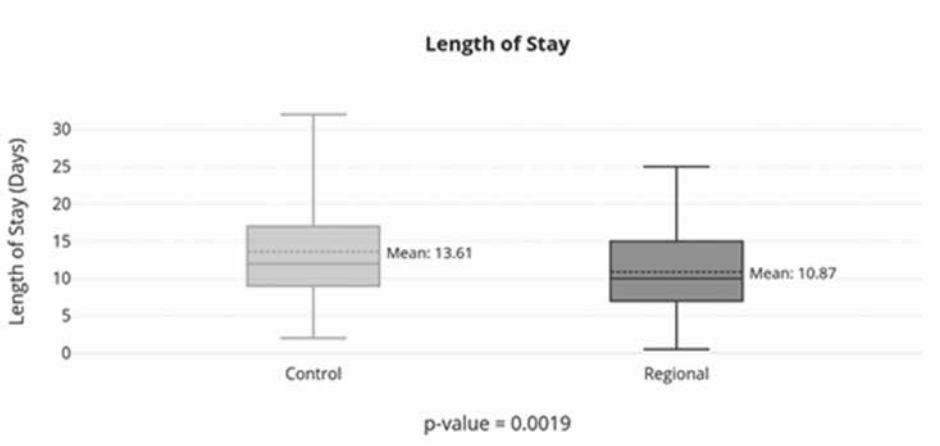

Figure 1

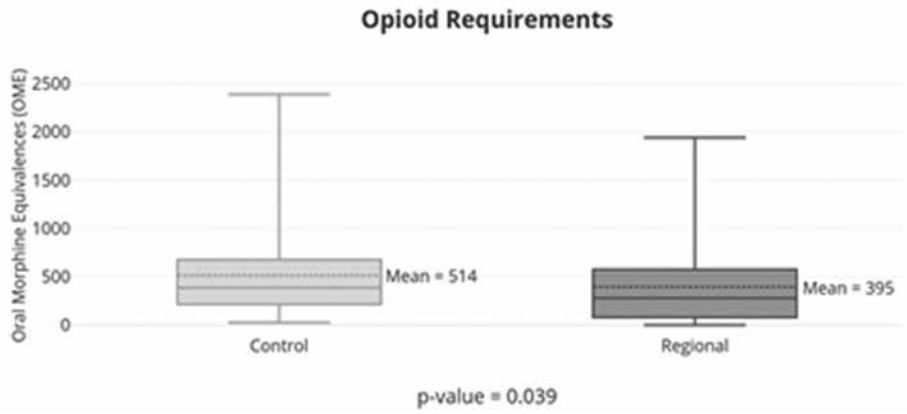

Figure 2

We hypothesize that the use of upper extremity peripheral nerve blocks will be associated with reduced hospital length of stay, postoperative pain scores and opioid requirements in patients who suffer from upper extremity burns requiring operative intervention.

Materials and Methods

As per institutional guidelines, this study was reviewed by Virginia Commonwealth University (VCU) Health Medical Center IRB board, and it is approved by IRB review requirements as per Virginia Commonwealth University's (VCU) Office of Research and Innovation policy as the study is devoid of patient identifiable information.

A retrospective analysis was conducted with 266 patients with upper extremity burns as the primary reason for admission and required operative management for their injuries. All patients received routine general anesthesia or monitored anesthesia care, and 75 patients also received perioperative regional anesthesia. Regional anesthesia modalities included supraclavicular, infraclavicular, interscalene, and axillary blocks, which were single shot injections with or without catheter placement. Basic demographic data, as well as burn total body surface area, mechanism, location, and severity were recorded.

The primary outcomes measured were hospital length of stay, oral morphine equivalents during inpatient stay, and persistent post-operative pain scores. Patients were

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FAER Speaks with Dr. Julie Huffmyer, 2020 FAER-ABA Research in Education Grant Recipient

Reprinted with permission: Original article can be found online at: https://www.asahq.org/faer/about/newsandevents/faer-speaks-to-julie-huffmyer

By Bram Harris
Development/Communications Coordinator
Foundation for Anesthesia Education and Research (FAER)

Dr. Julie Huffmyer

In the Spring of 2020, Julie Huffmyer, MD, was awarded a FAER-ABA Research in Education Grant (REG). Co-sponsored by the American Board of Anesthesiology (ABA), FAER-ABA REGs aim to advance the knowledge of anesthesiologists interested in the key elements of education in anesthesiology - curriculum, instruction, and assessment. Comprised of $100,000 in funding over a two-year period, Dr. Huffmyer's FAER-ABA REG is titled "The Association of MOCA Minute® Performance on ASPIRE Clinical Metrics."

Graduating from the University of Pittsburgh School of Medicine in 2004, Dr. Huffmyer went on to complete her anesthesiology residency at the University of Virginia, where she has been a faculty member since 2008. In 2011, Dr. Huffmyer was appointed Associate Program Director of Anesthesiology, before becoming Residency Program Director in 2016.

Dr. Huffmyer was gracious enough to respond to a selection of questions about her FAER-ABA REG. FAER is pleased to share her responses with you below.

What led you to pursue anesthesiology as a specialty, and more specifically, what led you to pursue anesthesia research?

"Like most medical students, my understanding of what it meant to be an anesthesiologist was vastly different than what I learned about anesthesiology in medical school. My first career was as an ICU nurse, and I knew that I loved taking care of critically ill patients. I found the clinical OR environment incredibly stimulating and rewarding as I learned to manipulate physiologic variables in real time. Anesthesiology allowed me to be physician, ICU nurse, and pharmacist all in one role! At [the University of Virginia], as an anesthesia resident, I had the extraordinary opportunity to be taught by fantastic faculty who encouraged me to pursue academics. I was awarded participation in the FAER Resident Scholar Program (RSP) to attend the ASA's annual meeting and present at FAER's research symposium, during which I decided to pursue academic anesthesiology. I have always loved teach-

Continued on page 22

Burn Injury Abstract, *from page 18*

randomly selected via Cerner Electronic Medical Record (EMR) Systems based on inclusion and exclusion criteria, and data was extracted from the EMR retrospectively.

Results

Unpaired t-test analyses comparing the primary outcomes in patients who received regional anesthesia and the control group showed a 20.1% reduction in hospital length of stay (mean of 10.9 vs 13.6 days, respectively, $p<0.05$, Figure 1) and a 23.2% reduction oral morphine equivalents ($p<0.05$, Figure 2) in the regional anesthesia group. There was no significant difference in persistent post-operative pain.

Discussion

Regional anesthesia, both as a single shot and/or catheter, is an important adjunct in management of isolated upper extremity burns to reduce opioid consumption and length of hospital stay. Perioperative pain management for severe burn injuries requires further research as these patients continue to have difficulty managing their acute and chronic pain syndromes as a consequence of burn trauma.

Regional anesthesia shows promise as a means of pain management for severe upper extremity burns, but additional research is required to determine if it becomes a staple technique for burn injury cases.

**Disclaimer: This article has not been peer-reviewed prior to publication in this newsletter.*

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nisms. Cerebral oximetry (rSO2) offers real-time tracking of regional cerebral tissue oxygenation using near infrared spectroscopy (NIRS) technology. If available, cerebral oximetry may be used for the rapid identification and management of reduced cerebral oxygenation. Baselines should be set on room air prior to induction, then interventions as required (adjusting the MAP, FiO2, PaCO2, hemoglobin, etc.) during the procedure to ensure rSO2 is maintained +/- 20% of baseline, or > 40, whichever is greater.11

2. Post-Operative Delirium Risk Reduction: Recent evidence has shown that benzodiazepine use increases the risk of post-operative delirium. A useful alternative is Dexmedetomidine, which can be started intraoperatively, and may be more effective than propofol at reducing the risk of delirium. A Dexmedetomidine infusion may be started intraoperatively and continued until extubation as needed.12-14
3. Infection Risk Reduction: As with any surgical procedure, IV antibiotics should be given within 1 hour before the surgical incision (2 hours for vancomycin or fluoroquinolones), although there may be additional benefit to giving antibiotics prior to central line placement.1
4. Lung Protection: A lung protective ventilation strategy has been shown to reduce lung injury. The current recommendations include using a tidal volume of 5-7 mL/kg IBW, PEEP > 5 cmH2O, and titration FiO2 to maintain SpO2 > 96%. In addition, intermittent ventilation, or CPAP, should be continued during bypass if acceptable.1
5. Blood Conservation: In addition to cell salvage and antifibrinolytics, Acute Normovolemic Hemodilution (ANH) has been identified as a Class 1 intervention to minimize the need for blood product transfusion. Perfusionists may also perform hemoconcentration/ultrafiltration in order to increase the hematocrit and reduce serum inflammatory mediators and tissue/pulmonary edema. Total bypass time and degree of hypothermia should also be minimized as much as possible.15-16

Postoperatively, enhanced recovery principles such as lung protective ventilatory strategies, multimodal analgesia, POAF prophylaxis, delirium mitigation and early nutritional support should continue to be an integral part of patient management.

Taken together, when ERAS concepts are incorporated into each phase of the patient's hospital stay, we have the potential to reduce morbidity and mortality, shorten ICU and hospital stay, and reduce overall cost to the healthcare system. We hope that through collaboration with the cardiac surgical team, intensive care unit staff, pharmacy and clinical nutrition, ERAS concepts will continue to be implemented and improve patient outcomes. In a healthcare climate focused on the delivery of quality care, patient outcomes and associated costs, such an initiative will help optimize clinical practice.

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ASA's Certificate of Completion in Diagnostic POCUS

Reprinted with permission: "ASA's Certificate of Completion in Diagnostic POCUS: Providing the Pathway to Competence for Anesthesiologists," ASA Monitor, 2021 Vol. 85, 10.

By William Manson, MD
University of Virginia
Charlottesville, VA

and McKenzie Hollon, MD FASE
University of Virginia
Charlottesville, VA

Dr. William Manson

Dr. McKenzie Hollon

As anesthesiologists, we are constantly confronted with the need to make real time decisions in patient management. Our decisions are guided by our ability to assess our patient's current situation and make a fast, accurate diagnosis, or at least exclude dangerous possibilities. Point of care ultrasound, POCUS, has revolutionized the ability of bedside physicians to obtain diagnostic information with the availability of portable, reliable, safe and low-cost imaging. Further, the utility and value of POCUS for cardiovascular, pulmonary, and abdominal POCUS is supported by an ever-expanding body of literature (1,2). Although the emergence of POCUS has exploded in recent years, incorporation into anesthetic practice is far from widespread.

The term POCUS refers to the use of ultrasound for diagnostic and therapeutic purposes in real time. The physician performing the POCUS examination acquires and interprets the images, usually with the goal of answering a binary question. POCUS can be done with simple equipment and only requires qualitative interpretation of 2D grayscale images. The current scope of diagnostic point of care ultrasound in anesthesiology includes cardiac ultrasound, pleural or lung ultrasound, gastric ultrasound, and the Focused Assessment with Sonography in Trauma (FAST). POCUS of the heart is also referred to as FOCUS, or Focused Cardiac Ultrasound. Importantly, cardiac POCUS, or FOCUS, is not equivalent to echocardiography (3). Although echocardiography can also be performed at the point of care, echocardiography is skill set that requires advanced training in image acquisition and interpretation. Fortunately, valuable information can be obtained with POCUS without the advanced training required for echocardiography.

As with all new advances in practice, the adoption of POCUS by clinicians has been widely varied. Many anesthesiologists have lacked exposure and access to education and training in this valuable modality, despite a call to action from experts (4). Recently, the American Board of Anesthesiology has identified multiple point of care ultrasound applications as core competencies for anesthesiologists, and asserted the role of POCUS in the anesthesiologist's practice by incorporating it into the forthcoming OSCE examinations. Many anesthesia training programs now include POCUS and echocardiography training, and the ACGME has updated its requirements for anesthesia residency to include POCUS applications (5). Despite these advances, not all training programs have yet incorporated POCUS and many practicing clinicians lack good options to acquire competence in diagnostic POCUS.

In an effort to make POCUS education widely available and to affirm the practice by anesthesiologists, the ASA created the Diagnostic POCUS Certificate Program. A Certificate of Completion can be earned by completing a series of parts intended to educate the learner and establish a standard of competence. The process for obtaining the Certificate of Completion in diagnostic POCUS is designed to be attainable even by learners with no prior ultrasound education.

The program involves a sequence of parts to ensure image acquisition and interpretation training in diagnostic pocus of the heart, lungs and pleura, and gastric antrum, and intraabdominal free fluid. The program is comprised of the following parts:

- Evidence of Prior Diagnostic POCUS Training: CME/ACGME Certificates: Image acquisition training will be accomplished by completion of either 10 hours of approved POCUS CME, or by 10 hours of POCUS training from an ACGME accredited program.
- Image Acquisition Training: Portfolio of Diagnostic POCUS Studies Performed: Competence in image acquisition will be ensured by submission of diagnostic POCUS studies performed by the learner, to be reviewed by an approved local mentor or ASA faculty.
- Image Interpretation Training: Online Case-Based Diagnostic Pocus Modules: The image interpretation education is accomplished through access to an online case-based platform which will take the learner through 140 unique cases. This platform consists of 100 cardiac, 20 lung, and 20 gastric cases, complete with image clips, questions for interpretation and detailed explanations with references for further reading. The FAST exam will be added in 2022. The cases are designed to train the learner in identification and differentiation of normal and abnormal pathology. The abnormal pathology includes the range of cases relevant to the practice of an anesthesiologist, including hypovolemia, cardiac dysfunction, pericardial and pleural effusions, pneumothorax, pulmonary edema, and gastric fullness.
- Final Exam: Competence will be ensured by completion of a final examination.
- Performance Improvement Activity: The final portion of the program is a performance improvement activity through which the learner will earn MOCA Part 4 credit; this portion consists of initially creating an action plan for improving clinical practice by incorporating POCUS,

Continued on page 22

POCUS, *from page 21*

followed by a reflection activity on the impact of the training.

With this certificate program, the ASA seeks to educate learners, advance clinical skills, and support anesthesiologists in performance of diagnostic ultrasound imaging. Completion of the certificate program will also be worth CME credits. ASA members can learn more and begin their journey to developing competency in POCUS at asahq.org/POCUS

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Dr. Julie Huffmyer, *from page 19*

ing and with the support of my mentor, Dr. Edward Nemergut, research in medical education has become the crux of an incredible career. As education researchers, we have an opportunity to develop and study novel methods for teaching in medicine."

Please speak briefly on your FAER-ABA REG research.

"The aim of our study is to explore the link between the ABA's longitudinal assessment component of the Maintenance of Certification in Anesthesiology®, the quarterly MOCA Minute questions, and clinical performance through use of Anesthesiology Performance Improvement and Reporting Exchange (ASPIRE) metrics. Our primary hypothesis is that annual MOCA Minute® composite performance (percent correct) is associated with composite ASPIRE clinical measure performance (percent compliant) for ABA diplomates. Ultimately in the future, by identifying which MOCA Minute® items are most strongly associated with clinical performance ASPIRE metrics, we anticipate that it may be possible to provide targeted MOCA Minute® question administration to anesthesiologists in order to improve the clinical practice of ABA diplomates."

What value do you see in organizations like FAER and the ABA coming together in support of anesthesia research and those who conduct it?

"As a former FAER Resident Scholar, and now an awardee of the FAER-ABA REG, I am grateful for the missions and resources of both organizations that serve to push forward the academic nature and practice of our specialty of anesthesiology. The work of the ABA in certifying physicians is valuable and necessary to assure the highest standards of Diplomates of the ABA. FAER's mission to develop the next generation of physician-scientists in anesthesiology is critical to the continued progress, development, and maintenance of the academic practice of anesthesiology. The FAER-ABA REG serves as a bridge between these organizations and their missions, allowing me to address an area of significant import by leveraging data provided by the ABA."

Do you have any advice for others interested in pursuing anesthesia research and FAER grant funding?

"Find a great mentor and research group with whom to work through multiple projects over time. Choose projects, of interest, that will have answerable/measurable outcomes and have a chance to make an impact. Much of what has been accomplished in education research has occurred due to perseverance in asking questions and developing ideas which then eventually become hypotheses and research projects. Some ideas will soar and produce impactful results, while others will be scrapped, but don't give up just because the first project does not come to fruition. Research in education is a long road, and it is important to stay the course for the long haul."

The Foundation For Anesthesia Education and Research is a related organization of the American Society of Anesthesiologists (ASA). For 35 years, FAER has been dedicated to developing the next generation of physician-scientists in anesthesiology. Charitable contributions and support to FAER help fuel the future of anesthesiology through scientific discovery. Funding priorities include: Research, Education, and Training. FAER has awarded over $49 million in research grants and programs since 1986. To donate to FAER, visit FAER.org/donate.

Follow Up: ERAS Pain Control Protocol Explained

A follow up to Dr. Wells' article in the VSA Update, 29(1), Winter 2021.

By Lynda T. Wells, MBBS
Associate Professor of Anesthesiology
University of Virginia
Charlottesville VA


Dr. Lynda T. Wells

A few months ago, I underwent moderate-grade surgery with Robotic assistance. The protocol assigned to the surgical procedure was "Gyn ERAS light". The pain control part of this protocol dictates oral acetaminophen 975 mg, celecoxib 200 mg and gabapentin 600 mg pre-operatively. During surgery, ketamine and lidocaine boluses and infusions are recommended. Dexamethasone, ondansetron and scopolamine are used for anti-emesis.

This protocol does not include an analgesic other than local anesthetic skin infiltration at the port sites. I have noticed that patients on this protocol who had the same surgery as me, all needed rescue opioids in the PACU if they are not given intraoperatively.

My goals were to be "pain-free" and go home the same day. Using a previous experience of laparoscopic surgery (pre-ERAS), I customized my pain control regimen as follows:

Pre-operative

Anti-inflammatories – oral acetaminophen and Celebrex. Omit gabapentin

Intra-operative

Anti-inflammatories, opioids, and anti-neuropathic - Methadone 15 mg IV at induction. Lidocaine bolus followed by infusion. (S-methadone is an NMDA receptor antagonist. One mg methadone = 1 mg S-ketamine). Omit ketamine.

Post-operative in PACU

Trial of opioids, then Regional Anesthesia - I experienced significant, localized sharp, burning pain related to subcostal port site. No other discomfort. Initially, I requested oxycodone 10 mg po (0.15 mg/kg) which reduced all other sensations, made me very sleepy, but failed to relieve the sharp, burning pain. Having established the pain was not sensitive to opioids I requested a local anesthetic block. A subcostal TAP block was performed with instant relief. No pain at all and completely functional until the following morning when it wore off. I do not know if pre-operative gabapentin would have helped but I wanted to avoid unnecessary sedation to facilitate same day discharge.

Post-operative, at home:

Alternating acetaminophen 975 mg q 6h with ibuprofen 600 mg po q 6h I was able to achieve excellent pain control, except for the subcostal port site. I discovered non-pharmacologic techniques such as stretching my abdomen and small rocking movements eased the port site pain considerably. After 48 hours using acetaminophen, the cannabinoid effects became apparent. I did not like the "foggy" head and dysphoria, so I stopped taking it after day 3. Since there was no change in my pain, I decided to also stop taking ibuprofen. Still, with no change in my pain, I remained off all pain control medications from post-operative day 4 onwards. My only exposure to opioids postoperatively was the oxycodone "experiment" in the PACU.

It took eight weeks for the port site pain to subside completely. Now I only sense it when I adopt certain postures or get poked in the ribs.

For me, the best approach was anti-inflammatories, methadone, local anesthetic in all its forms, and movement. Everyone is different. Good luck in customizing your own ERAS protocol if the time comes.

Thanks for Anesthesia Gases Article

By Claudia H. Viens, MD
Director of Cardiac Anesthesia
Winchester Medical Center
Winchester, Virginia

Thank you for your recent piece "Reduce Pollution by Eliminating Anesthesia Gases." It was very timely as our department is currently exploring moving away from desflurane.

Our process started in November 2020 when Dr. Jodi Sherman, Associate Professor of Anesthesiology at Yale University, gave a virtual presentation titled "Healthcare Pollution and Environmental Sustainability: Balancing Patient Safety and Public Health". She is incredibly knowledgeable on this topic and by the way, she does most of her cases under total intravenous anesthesia (TIVA).


Dr. Claudia H. Viens

Subsequently, I was introduced to a great talk by Dr. Meyer - "High-Value Anesthesia Care and the Social Cost of Carbon", available on YouTube as part of the Virginia Clinicians for Climate Action (VCCA) Webinar series.

As Dr. Meyer clearly demonstrates in his talk, eliminating desflurane significantly reduces carbon emissions and also cuts costs. Although it's a far cry from eliminating volatiles all together, I believe it's a tremendous first step. Thank you VSA Newsletter, for spreading the word on this important topic!

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