

# INTERCHANGE

Society of Critical Care Anesthesiologists Newsletter Volume 29 | Number 3 | FALL 2018

## PRESIDENT'S MESSAGE

In an environment where we are frequently asked to provide survey responses, our recent SOCCA survey was an outlier. In the positive sense. 161 of you provided feedback that will help shape the future of SOCCA. While 53% of you were satisfied with SOCCA, we clearly have areas in which we can improve. General themes included the need for ongoing educational content delivered in various forms (e.g., on line content for just in time use) as well as professional development resources. It is also clear that there is considerable desire by members to become more involved in SOCCA activities.



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be employed to this end, with an emphasis on learners and early career anesthesia intensivists. We are working with IARS to make our educational content available in multiple formats. As learning and communication formats evolve, we need to position ourselves in these spaces in order to effectively advance our mission. Considerable member involvement will be needed as we disseminate our educational content (think annual meeting, Resident's Guide) across select platforms. If you have experience or skills in education or social media, please consider becoming involved as we launch these efforts.

The SOCCA Board held a strategic planning retreat in Chicago, September 14th and 15th. During this facilitated retreat, the Board utilized the survey results and began to develop a strategic plan that is aligned with SOCCA's mission and membership needs. Once finalized, a summary of the retreat will be made available to members via the SOCCA website. The Board, led by Steve Surgenor, is editing society by-laws to reflect our closer alliance with the IARS and its annual meeting and to allow for increased member engagement in organizational activities. Revised by-laws will be posted for comment and review prior to a membership vote for approval.

One strategic goal is to increase our numbers by increasing the value of SOCCA membership. Multiple tactics will

Later this year, a Nominating Committee will be appointed to determine a slate of candidates for open board positions. This committee will be chaired by our immediate past-president, Dr. Avery Tung. Expect a solicitation for nominees around the new year. It is the desire of the Board to increase diversity and we encourage all interested individuals to apply.

Finally, I would like to take the opportunity to ask you to save the date for our Annual Meeting in Montreal on May 17th, 2019 at the Queen Elizabeth Hotel. Drs. Sheela Pai Cole and Peter von Homeyer are planning an excellent day of education and professional development not to be missed.



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## SOCCA STRATEGIC PLANNING SESSION



# Editor's Message

Hello!! It is my pleasure to introduce myself to you as the newest editor of our SOCCA Interchange Newsletter. I have been a part of the Newsletter now for a number of years, writing and editing a wide variety of interesting and informative pieces under the direction of previous editors that have mentored me in many different ways.

One of the most important lessons from these editorial mentors was that communication and collaboration are the essential clinical, educational and research features of Critical Care Anesthesiologists. To a large degree, communication is the hallmark feature of our specialty, whether it's communicating with colleagues (of many different specialties), patients or families, about treatments, diagnoses, tests, and many other details, we are frequently responsible for initiating and leading truly great conversations. Our Society and the SOCCA Interchange Newsletter should be no exception. We can be great communicators...it's in our very DNA...and that's the spirit I want to foster in everything we do as a part of the Communication Committee and the SOCCA newsletter moving forward.

To that end, the SOCCA newsletter is changing in small ways that build on our previous successes in communication and collaboration for our Society, its members, and our critical care profession. We are developing a few new sections, specifically to highlight what our Society and its members are doing. In essence, we want to better communicate all the ways that SOCCA members are improving patient care today, tomorrow, and for generations to come. These new sections will highlight interesting patient care issues that our members encounter,



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profiles of research conducted by our members, and topics that are important to our professional and personal well-being. You will see all these new sections starting in this issue of the newsletter.

In addition, we are developing an integrated communication plan for our members that exists beyond just the SOCCA Interchange Newsletter. Did you know SOCCA is on twitter? Today, SOCCA has more than 400 twitter followers. So, please follow us on twitter (@SOCCA\_CritCare) so that we can continue to integrate communication between the Society, its Board and you. In the future, we will also develop other appropriate social media communication outlets such as Facebook and Instagram, with approval and oversight of the SOCCA Board. Maximizing our Society's

use of existing social media communication and collaboration opportunities is a next logical step for all of us and can be a relatively safe way for you to join the ongoing collaborative and real-time conversations that are important to way we undertake clinical care, education and research.

Finally, I want to ask for your help. We need you, your knowledge and your expertise to write future articles for this newsletter. If you have an idea for an article, an interesting case, or just a desire to be more engaged with other members of the Society, please contact me (kevin.hatton@uky.edu) or our administrator, Vivian Abalama (vabalama@iars.org), at any time. We have developed a supportive environment for writers with many different levels of experience from novice to expert. We want to hear from you!! 🏠



## JOB BOARD

**Have you visited SOCCA's Job Board recently?** Recent listings include positions with Anesthesia Associates of Morristown, New Jersey; American Anesthesiology of Atlanta, Georgia; and Midwest Physician Anesthesia Services of Columbus, Ohio. Read more of the members-only job posts and, if you would like to post a job on this site, please email a description and /or flyer to SOCCA Society Director, Vivian Abalama, CAE, IOM at [vabalama@iars.org](mailto:vabalama@iars.org).

## FEATURED ARTICLE

# Critical Care Pain Management in the Era of Enhanced Recovery and the War on Opioids

Chronic pain syndromes are a persistent problem in the United States, with conservative estimates suggesting a cost \$560 to \$635 billion dollars annually<sup>1</sup>. Chronic pain following intensive care unit (ICU) survival is difficult to quantify, as patient populations vary across hospital centers and within different ICU settings; however, current evidence demonstrates that anywhere from 12-60% of patients remain affected by chronic pain at 6-months to a year following ICU admission, which contributes to a significant portion of diagnoses nationally<sup>2,3</sup>. Opioid-based therapies have been the mainstay for treatment of acute pain, sedation, and ventilator dyssynchrony in the ICU, as well as for chronic post-injury pain. Recent evidence highlights problems with maintenance of these therapies, ranging from inadequate treatment of acute pain, worsening of chronic pain, addiction and diversion<sup>4</sup>. As with many therapies initiated in the ICU, administration and continuation of opioid medications can have a lasting impact on the health of our patients for months to years following their hospital course. A systematic and multimodal approach to ICU pain management must be a consideration for the Anesthesiology Critical Care Specialist, as we work to improve long and short-term patient outcomes.

Inadequate or inappropriate sedation and pain management in ICU patients can contribute to a multitude of adverse effects delaying patient recovery involving the respiratory, cardiovascular, gastrointestinal, and endocrine systems<sup>5</sup>. Inadequate pain control is also a major contributor to post-traumatic stress disorder among ICU survivors, with psychosocial impacts affecting patient quality of life. Acute pain is most commonly managed with potent intravenous opioids, such as morphine or fentanyl, as first-line agents recommended by current guidelines<sup>6</sup>. Efforts to slowly taper these will often result in patients discharged on prescription opioid medications. Evidence tells us that without



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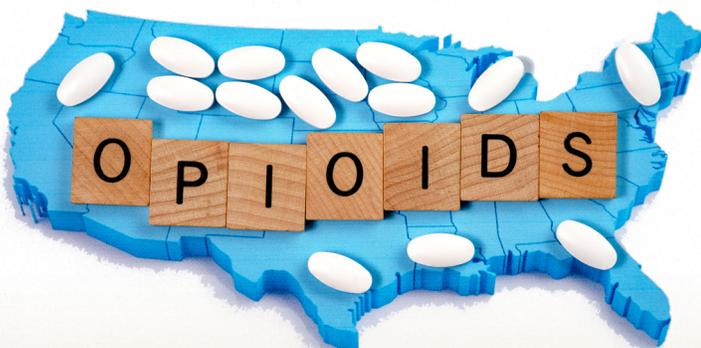
concerted effort to discontinue these drugs, patients will continue to take them and even escalate the doses, as they become less effective over time. The effects of postoperative opioid abuse and dependence is shown to have significant effects on health care utilization and patient outcomes, with higher 30-day readmission rates due to infection, overdose, or acute pain management being more common among these patients<sup>7</sup>. There is no question that survivors of critical illness are at risk for similar complications.

In the perioperative arena, implementation of enhanced recovery after surgery (ERAS) programs, with targeted interventions and focused care, has resulted in significantly improved postoperative outcomes<sup>8,9</sup>. One of the concepts common to all ERAS pathways is, notably, a reduction in the use of opioids for analgesia. Through the use of multimodal pharmacologic interventions, intentional reduction of intraoperative opioid administration, and appropriate regional and neuraxial analgesia, perioperative opioid use has decreased dramatically<sup>9</sup>. Logically, these strategies should be expected to help reduce unnecessary opioid use and abuse in the community, notably at a time where opioid reduction strategies are encouraged, if not mandated, from a national perspective.

While most of the benefits attributed to ERAS protocols, such as reductions in length of stay, opioid use and surgical site infection, have been seen in patients following elective colorectal, urologic and gynecologic procedures<sup>8,10</sup>, it is reasonable to expect many of them to translate to more complex patient situations, including those involving critical care patients. We have seen recent development of ERAS protocols for common cardiac<sup>11</sup>, thoracic<sup>10</sup> and neurosurgical<sup>12</sup> procedures, and their implementation will ideally shorten duration of mechanical ventilation and length of ICU stay, as well as reducing common ICU-associated complications such as delirium and health care-associated infection. Additionally, the appropriate management of pain and agitation associated with critical care, would be expected to help post-ICU recovery in these patients.

Some barriers exist to enacting ERAS-like protocols in an ICU setting. There is a relative paucity of evidence to support alternative pain management strategies in critically ill patients, especially those with medical illness, and many opioid alternatives are difficult to dose, given the variability in gastrointestinal function and availability. The patient with

*continued on page 4*



sepsis and ARDS may require different opioid-reduction strategies than the postoperative small bowel resection, so a one-size-fits-all approach is unlikely to be effective. Workload and knowledge deficits may contribute to reduced use of local anesthetic for incisional, procedural and traumatic pain. As an example, while it is fairly well-established that epidural analgesia is beneficial in thoracotomy and traumatic rib fracture, many other conditions may benefit from the pain relief and sympathetic outflow reduction associated with somatovisceral nerve blockade, such as pancreatitis, necrotizing superficial infections and burn injury.

We continue to rely on opioid and benzodiazepine infusions for analgesia and sedation of the critically ill patient. However, as evidence mounts to support reduction of deep pharmacologic sedation, even ventilated patients should be kept awake and interactive as tolerated. The role for non-opioid and non-sedating analgesia should therefore increase. Adjuncts such as acetaminophen, gabapentin, clonidine, ketamine, lidocaine infusions, regional analgesia, and non-steroidal analgesics have been increasingly studied and shown not only to be well tolerated, but also effective in decreasing opioid requirements<sup>13-17</sup>. Even still, there continues to be an over-reliance on opioid medications and a lack of utilization of multimodal adjuncts in the management of pain associated with critical illness. Surgical and nonsurgical conditions will obviously mandate consideration of different therapies, but awareness and availability of appropriate alternatives is paramount to any successful approach.

The next steps in the development of structured pathways for reduction of post-ICU opioid use should be construction, implementation, and audit of a systematic and multimodal recovery program for ICU patients to address and potentially decrease the rate of post-ICU chronic pain syndromes. The focus would ideally be not only on enhancing multimodal adjuncts to limit patient reliance on opioid medications, but also include discontinuation regimens to prevent long-term opioid dependence and the poor outcomes associated therewith. Opioids have an important role in the treatment of acute pain for many ICU patients, but their use should be deliberate and balanced with other pharmacologic and non-pharmacologic therapies to continue to improve and advance patient care in both the hospital setting and following discharge. 🏛️

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# CASE REPORT

## Acute Airway Obstruction After Percutaneous Tracheostomy



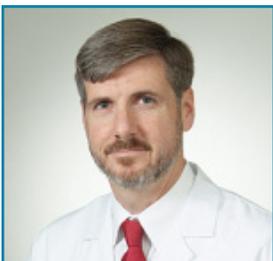
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### BACKGROUND:

Bedside percutaneous tracheostomy is a common, well-tolerated bedside procedure for critically-ill patients with prolonged respiratory failure. In this report, we present an uncommon and potentially dangerous complication of this procedure.

### CASE REPORT:

A 62-year-old female with severe preoperative decompensated liver cirrhosis (MELD score 30) and end-stage kidney disease underwent percutaneous tracheostomy by the primary surgical team following combined liver and kidney transplantation complicated by prolonged postoperative hypercarbic respiratory failure. Shortly after the procedure, the patient developed new-onset hypoxemia requiring a significant increase in FiO<sub>2</sub>. A STAT chest x-ray performed at that time revealed complete collapse of the left lung. (Figure 1)



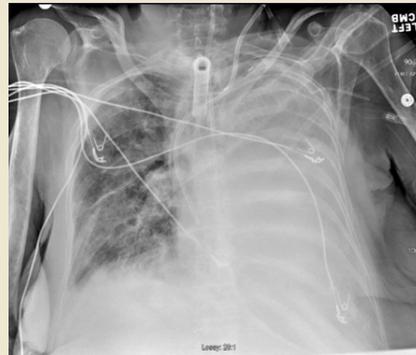
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Because of the patient's clinical deterioration and x-ray results, emergent bronchoscopy was performed to restore left lung ventilation and assess possible causes of lung collapse. The bronchoscope was passed through the newly-placed tracheostomy into the left mainstem bronchus, which, on initial evaluation, appeared to be filled with clear fluid that could not be suctioned from the bronchus. (Figure 2) After additional inspection, this clear fluid appearance was due to a clear plastic foreign body (FB) in the left mainstem bronchus, completely obstructing the left lung. (Figure 3) The FB was then removed from the airway by bronchoscopic suctioning. The patient's post-bronchoscopy chest x-ray showed resolution of her left lung collapse. (Figure 4)

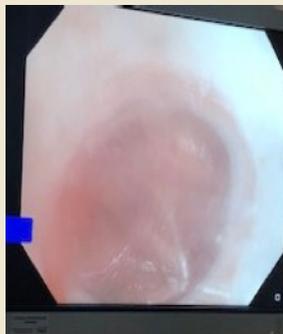
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### FIGURES:

**Figure 1:** Chest x-ray taken during desaturation event.



**Figure 2:** Bronchoscopic view of clear fluid



**Figure 3:** Bronchoscopic view of clear plastic along lower right border of image



**Figure 4:** Chest x-ray after removal of clear plastic foreign body and post-obstruction secretions.



## DISCUSSION

For many critically-ill patients, bedside percutaneous tracheostomy is an important step toward ventilator separation. Although hemorrhagic complications may occur either at the time of the procedure or within a few hours after, most other complications occur during the procedure itself. In this case, clinical evidence of the complication manifested approximately 20 minutes after the procedure was completed and the surgical team had already left the bedside, leaving the anesthesiology critical care team to rapidly assess the situation and develop potential solutions to stabilize the patient.

We believe that the clear plastic FB was mostly likely caused by a tear in the endotracheal tube (ETT) cuff at the time of the procedure, primarily because the ETT was not pulled back far enough before the introducer needle was advanced into the trachea. In this situation, the introducer needle most likely perforated the endotracheal tube balloon during percutaneous entry. Air was aspirated by the surgeon from the cuff, although, at the time, he believed he was withdrawing air from the trachea. The surgeon did not recognize the error and advanced the guidewire through the introducer needle, into the airway, likely causing a second hole in the ETT cuff. When the dilator was then advanced over the guidewire, the torn ETT cuff was advanced into the airway where it became lodged in the left mainstem bronchus.

In discussion with the surgery team, they reported use of bronchoscopy prior to the procedure and after the tracheostomy was placed but did not utilize bronchoscopy in real time to monitor the procedure from inside the tracheostomy as it was being performed. This complication may have been avoided if real time bronchoscopy was used to visualize percutaneous placement of the introducer needle, guidewire, dilator and tracheostomy. Fortunately, emergent bronchoscopy was able to remove this clear, plastic foreign body. Rigid bronchoscopy

or other, more advanced, therapies may have been necessary to restore bilateral ventilation if bronchoscopy had failed.

Complications of tracheostomies have been reported to occur in approximately 15% of patients. (1,2) The majority of which occur greater than one week after procedure. Complications are generally divided into short and long term. Short term complications include hemorrhage, infection, pneumothorax, tracheostomy tube obstruction, and accidental decannulation. Long term complications include tracheomalacia, tracheo-innominate artery fistula, tracheoesophageal fistula, pneumonia, aspiration, granuloma, airway stenosis, and decannulation failure. (1-4) Airway obstruction accounts for 18.5% of these complications, most commonly attributed to mucus plugging. (3-4)

In summary, we report an uncommon cause of post-procedure hypoxemia after seemingly-uncomplicated percutaneous tracheostomy caused by inadvertent and unrecognized ETT cuff tear. Critical care anesthesiologists should be cognizant of this possibility in unexplained hypoxemia, especially with lobar consolidation on CXR, following percutaneous tracheostomy. 🏠

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Anesthetics.  
Pediatric  
neurotoxin  
or not?

Help us find a resolution  
to the debate.

SmartTots



## RESEARCH UPDATE

# Defining and Defending a Blood Pressure in the Operating Room & Intensive Care Unit



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**Supported by internal funds only.**  
Dr. Khanna is supported by the Foundation for Anesthesia Education & Research (FAER) mentored research training grant.

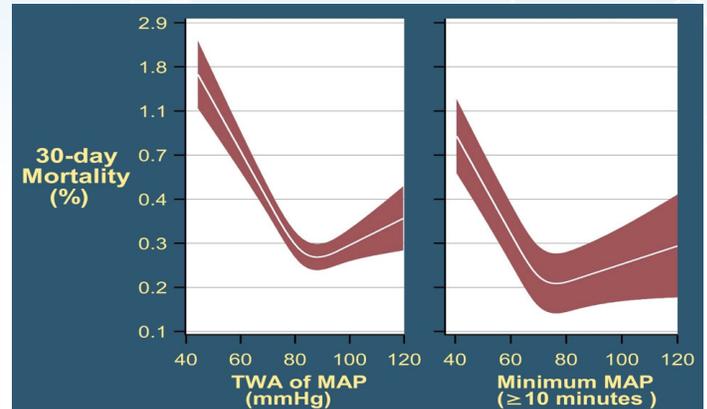
Despite surgical patients presenting to the operating room (OR) sicker than ever before, the intraoperative period has, paradoxically, become far safer. Current estimates of intraoperative mortality are less than 1 in 100,000 patients<sup>1</sup>. However, 30-day postoperative mortality is still significant at 1-2%, a fact that suggests that if 30-day postop mortality were considered a disease, it would be the third leading cause of death in the United States<sup>2</sup>.

There are few interventions that anesthesiologists and intensivists can offer that have direct evidence of improved patient survival. The one goal of anesthetic management over the years has been hemodynamic stability. There is now, more than ever before, direct evidence of the damaging effects of low blood pressure. These effects are clearly associated with myocardial injury, mortality and acute kidney injury. In addition, these effects extend beyond the operating room, into the post-surgical recovery wards and for the critically ill patient in the intensive care unit (ICU). Appropriate definition

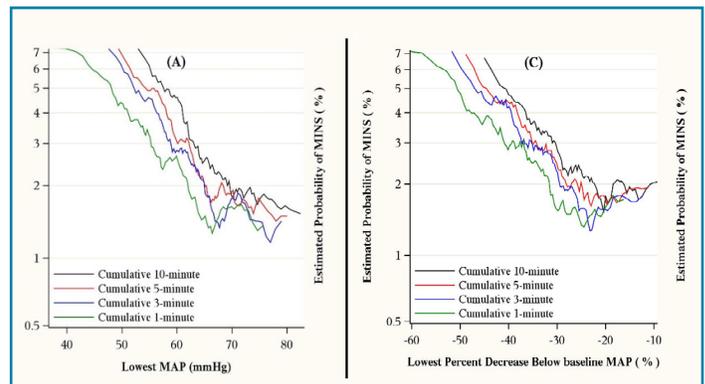
of threshold pressures in the operating room and ICU and a rationale strategy for defending these is of utmost importance in current practice.

## INTRAOPERATIVE BLOOD PRESSURE

Even brief periods of mild intraoperative hypotension (at thresholds that were previously considered tolerable) are harmful. Once mean arterial pressure (MAP) reaches 55 mmHg, only a few minutes of exposure is associated with myocardial and renal injury.<sup>3</sup> Minimum intraoperative MAP maintained for ten minutes at less than about 70 mmHg is strongly associated with mortality (Fig. 1).<sup>4</sup> There are similarly strong associations between hypotension and myocardial injury (MAP threshold 65 mmHg) (Fig. 2A) and kidney injury (MAP threshold 75 mmHg).<sup>5</sup> Importantly, these relationships are maintained when MAP is expressed as a percentage of baseline blood pressures. (Fig. 2C) In an analysis of adults having non-cardiac surgery at the Cleveland Clinic, a full third



**Figure 1:** Mortality in the 30 post-operative days as a function of time-weighted average (TWA) mean arterial pressure or lowest mean pressure maintained for at least 10 minutes. With permission from Mascha et al: Intraoperative mean arterial pressure variability and 30-day mortality in patients having noncardiac surgery. *Anesthesiology* 2015; 123: 79-91



**Figure 2:** The left graph (A) shows the relationship between the lowest cumulative absolute mean arterial pressure maintained for 1, 3, 5, and 10 minutes and myocardial injury. The right graph (C) shows the relationship between the lowest cumulative relative mean arterial pressure maintained for 1, 3, 5, and 10 minutes and myocardial injury. Both were highly predictive, but relative thresholds were not more predictive than absolute thresholds which are easier to use. The relationships were generally similar for acute kidney injury (not shown). With permission from Salmasi, et al: Relationship between intraoperative hypotension, defined by either reduction from baseline or absolute thresholds, and acute kidney and myocardial injury after noncardiac surgery: A retrospective cohort analysis. *Anesthesiology* 2017; 126: 47-65.

of all hypotension, (MAP threshold <65 mmHg), occurred in the post-induction to pre-surgical incision period. The hypotensive insult was significantly and comparably associated with both myocardial and kidney injury before and after incision<sup>6</sup>. Knowing that this hypotension before incision results almost exclusively from anesthetic drugs, suggests that it should be largely preventable. A major limitation of these large datasets

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is their observational nature. Unfortunately, this means that there exist both known and unknown confounding factors and which are related to both exposure and outcome. Therefore, the reported hypotension may simply be a marker of underlying illness rather than a mediator of harm.

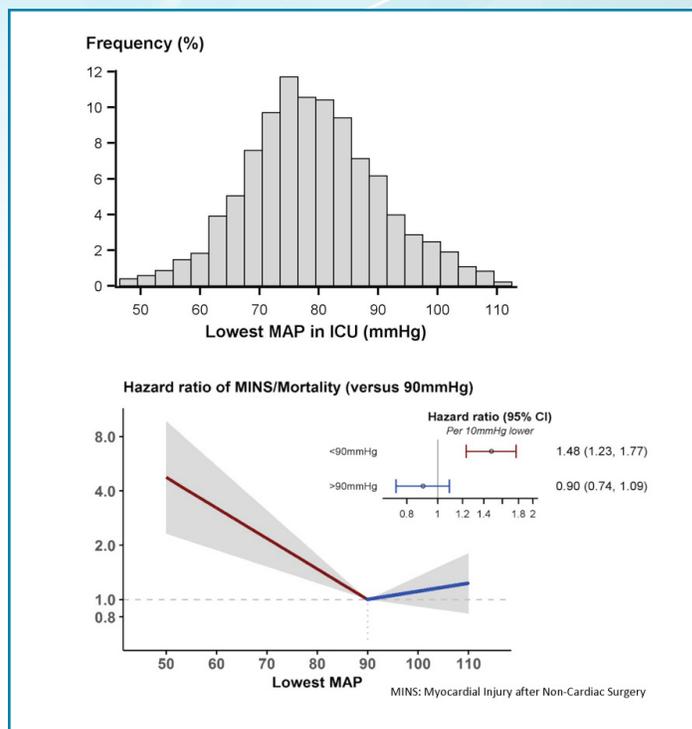
Randomized trials of intra-operative blood pressure control are rare and difficult to conduct. Notably, recent work by the INPRESS investigators lead by Futier and colleagues compared tight vs. minimal intraoperative blood pressure control (n=298).<sup>7</sup> High-risk patients were randomized to minimal blood pressure control (ephedrine for systolic pressure <80 mmHg or <40% below baseline) vs. a norepinephrine infusion to maintain systolic pressure within 10% of baseline values during and for four hours after surgery. The primary outcome, a composite of systemic inflammatory response syndrome and/or at least one organ failure, occurred in 56/147 patients in the norepinephrine (tight control) group vs 75/145 patients in the minimal control group: relative risk 0.73 [95% CI: 0.56, 0.94]. The intervention threshold of a systolic pressure of 80 mmHg is low compared to what most anesthesiologists would react to in real life. It is very likely that a higher intervention pressure presumably would have reduced the observed 25% benefit.

## BLOOD PRESSURE IN THE CRITICALLY ILL PATIENT IN INTENSIVE CARE UNITS

Hypotension in critical care units may be profound, prolonged and especially damaging because of several co-existing, complicated and often cumulative other insults. Similar to the intraoperative period, there is increasing evidence for an association between hypotension at thresholds that seem to challenge the general norm of 65 mmHg established by the surviving sepsis campaign guidelines and serious complications.<sup>8-10</sup>

At the Cleveland Clinic, we recently evaluated a cohort of 2,918 postoperative critical care patients and saw an association between the lowest recorded MAP and a primary composite of myocardial injury and in-hospital mortality at 7 days. At MAP less than 90 mmHg, every 10-mmHg difference between patients in the lowest MAP on any given day increased the risk of the primary composite by about 50%.<sup>8</sup> (Fig.3) Hypotension and acute kidney injury was linearly related over the entire range of MAP from 50 mmHg to 110 mmHg, with an adjusted overall hazard ratio of 1.16 (1.29 for stage 2&3 acute kidney injury) per 10-mmHg reduction in the lowest recorded MAP.

We have also shown that both the duration and severity of hypotension matter. For example, an hour of exposure to 80 mmHg was similar in damage to even a few minutes below 70 mmHg.<sup>8</sup> Whereas these data were from a postoperative (mostly non-septic) patient cohort, another recent examination

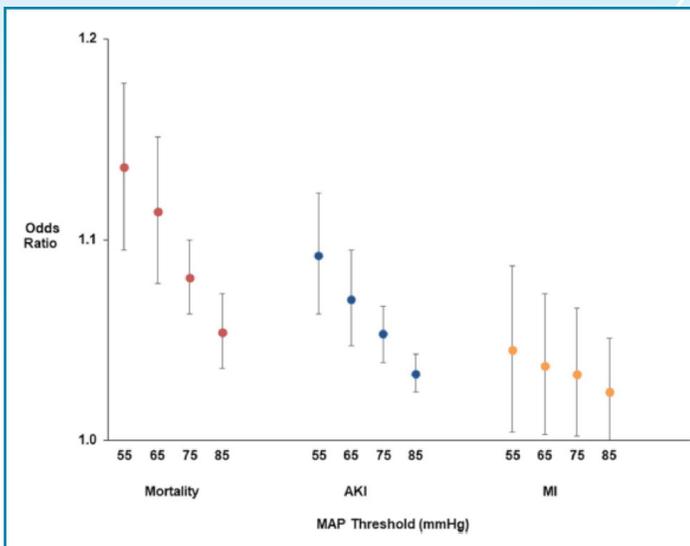


**Figure 3:** Association of exposure to hypotension at mean arterial pressures (MAP) less than 90 mm Hg and a primary composite outcome of myocardial injury after non-cardiac surgery (MINS) and mortality. For any two postoperative patients in the surgical ICU with a 10 mm Hg difference in the lowest MAP per day of less than 90 mmHg there was a nearly 50% increase in the hazards of the primary outcome. With permission from Khanna AK et al: Hypotension increases acute kidney injury, myocardial injury and mortality in surgical critical care. *Critical Care Medicine* 2018, 46(1):71. (Presented at SCCM 2018, San Antonio, TX)

of nearly 9,000 septic patients across 110 ICUs in the United States saw a similar signal for harm at a higher threshold MAP. Specifically, this study saw that the risks for mortality, AKI, and myocardial injury first developed at a MAP of 85 mmHg, and the risk of mortality and AKI progressively worsened at lower blood pressures, on a MAP range from 55-85 mmHg. (Fig. 4)<sup>9</sup> Other smaller cohorts have also reported MAP-associated organ system injury at thresholds normally considered safe in the surgical and mixed ICU populations.<sup>11,12,13,14</sup> It is worth keeping in mind, however, that the interpretation of all these hypotension data is complicated by sepsis. Because sepsis results in both hypotension and organ system injury from independent, although related, mechanisms, significant dependent-variable confounding occurs in all of these analyses.<sup>15</sup>

Interestingly, hypotension in critical care units has also been associated with delirium. Aldemir and colleagues screened 818 critical care patients daily for 10 days and reported an association between systolic pressure <80 mmHg and delirium.<sup>16</sup> Likewise, at the Cleveland Clinic, we have seen that a 10-mmHg reduction in the lowest MAP on each day during ICU stay at a MAP of less than 65 mmHg was significantly associated with a higher hazard of delirium, with an adjusted

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**Figure 4:** Association of hypotension exposure with in-hospital mortality, AKI and myocardial injury. Adjusted odds ratios and 95% confidence intervals for a 1 mmHg increase in TWA-MAP, below different thresholds are shown for the primary outcome of in-hospital mortality and secondary outcomes of acute kidney injury and myocardial injury. With permission from Maheshwari, et al: The relationship between ICU hypotension and in-hospital mortality and morbidity in septic patients. *Intensive Care Med.* 2018 Jun 5. doi: 10.1007/s00134-018-5218-5. [Epub ahead of print]

hazard ratio 1.16 (95% CI: 1.07, 1.26; P<0.001) (unpublished data-Cleveland Clinic).

Only one large multicenter randomized controlled trial of different blood pressure targets has been performed to date. In that study, no difference in mortality was noted for blood pressure targets of 80-85 mmHg or 65-70 mmHg in patients with septic shock.<sup>17</sup> However, a closer look at this work shows that the actual blood pressure targets achieved were different (85-90 mmHg vs. 70-75 mmHg) from experimental design, making it difficult to answer questions about hypotension from this published work. In addition, there were no assessments of myocardial injury (MINS) based on systematic collection of troponin bioanalysis and clinical myocardial infarction were only observed in 9 patients which precluded reliable assessment of this important outcome. Other important findings from this landmark work were that atrial fibrillation was more common in patients assigned to higher blood pressure and patients with chronic hypertension who were assigned to the lower pressure target had more renal injury and the prevalence of renal replacement therapy was higher in this subgroup. This study and other smaller studies have significantly associated higher blood pressure targets with more cardiac arrhythmias and vasopressor use, without detecting a difference in serum lactate, regional blood flow, or mortality compared with lower blood pressure targets.<sup>18-21</sup>

## CONCLUSIONS

Today, the available data suggests that MAP well above the established norm of 65 mmHg (and possibly higher than the threshold for the operating room) are needed to prevent hypotensive organ injury in postoperative critical care patients, including those who are septic.<sup>8,9,22</sup> A plausible explanation relates to the need for increased perfusion pressures in critically ill patients who have coexisting acute insults in the setting of complex chronic conditions, including extreme sympathetic stimulation, fluid shifts, nutritional deficits, infectious diseases and hypermetabolic/hypercatabolic states. While previous concern for arrhythmias when pushing higher MAP targets using catecholamine mono-therapy may have been appropriate, it may be possible to achieve higher MAPS without this risk due to the recent advent, approval and adoption of newer, more potent (non-catecholamine) vasopressors such as Angiotensin II.<sup>23</sup>

Overall, we may be correct in defining a harm threshold of MAP of about 65 mmHg in the intraoperative period, and possibly considerably greater in critical care units; however, it also seems likely that this may not be an adequate threshold in all patient groups. The available data is largely retrospective and has several concerns for confounding. While this concise review covers the most recent work in this area, readers are also referred to a comprehensive overview of all contemporary published literature & relevant trials.<sup>22</sup> Randomized data is sparse, but suggests that at least some harm can be prevented by intervening to limit the severity and duration of even mild hypotension. The message remains loud & clear for Critical Care Anesthesiologists: “Define a MAP and then defend that MAP” whatever clinical setting your patient may be in. 🏠

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## SUBMISSION GUIDELINES

Are you interested in contributing an article to SOCCA Interchange? Please familiarize yourself with the [submission guidelines](#) before you proceed. Thank you for your interest and contact Vivian Abalama, CAE, IOM at [vabalama@iars.org](mailto:vabalama@iars.org) with any questions.

## WELLNESS SERIES

# Sometimes, It's About the Journey, Not the Destination

The medical field has finally begun to recognize the impact of job satisfaction and burnout. While much attention has been paid to how changes in the work environment affect this state of affairs, less thought has been given to how variables *outside* the hospital or clinic could impact physician well-being. This is particularly relevant to critical care medicine: in Medscape's 2018 Physician Lifestyle Report<sup>1</sup>, which polled over 15,000 physicians across 29 specialties, a whopping 48% of critical care physicians reported feeling burned out. This was the highest rate of any specialty. In this quarterly series, we hope to investigate potential causes of job dissatisfaction and burnout among ICU physicians, exploring potentially novel causes, and to provide some ways to provide for your own well-being.



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Looking beyond the world of health care, workers as a whole cite the daily commute as one of the most stress-provoking and unpleasant parts of their day. According to the Census Bureau, Americans commute an average of 51 minutes round trip per day, although more than 600,000 workers commute more than 180 minutes round trip. One 2014 study found that individuals with longer commutes have lower overall life satisfaction and an increased sense of time pressure, largely due to dealing with traffic congestion and lack of physical leisure time.<sup>2</sup> Despite these results, it appears that individuals do not necessarily take this into account when choosing a job: an unpublished study cited in the *Harvard Business Review* found that a majority of employees preferred a job paying \$67,000 per year with a commute time of 50 minutes to one paying \$64,000 with a 20-minute commute.<sup>3</sup> Workers may not even realize the impact of this indifference, since a large study from the United Kingdom has indicated that a 20-minute increase in commuting time causes the same decrease in job satisfaction as a 19% decrease in pay.<sup>4</sup>

More time spent in transit to and from work may not just be damaging psychologically, but may also be deleterious to our physical health. Longer commutes have been associated with elevated blood pressure, worsened metabolic risk factors, and decreased cardiorespiratory fitness.<sup>5</sup> This relationship appears to be mediated by the decreased time available for physical activity resulting from longer commutes, as well as decreased overall energy expenditure throughout the day.

It is worth noting, however, that the length of a commute is not the only factor influencing a worker's mental and physical health; the mode of transport also has a pronounced effect. For instance, commuters who walk or cycle to work do not report

the same decreases in leisure time satisfaction that result from other methods.<sup>4</sup> It is likely that this is due to commutes by foot or pedal being psychologically categorized as part of the day's physical activity instead of as "wasted" time. Bus commuters are more susceptible to the negative effects of a long commute, possibly because longer journeys by bus are more complex and thus have more opportunities for delays and complications. Rail commuters, in contrast to those who travel by other means, seem to exhibit less stress with longer-duration commutes than short ones; this is likely related to the fact that longer train journeys tend to take place on commuter lines that have more seating and amenities, whereas short commutes depend on subways and other such

lines that tend to suffer from crowding.<sup>4</sup>

So what does this all mean for critical care physicians? Currently, the National Association of Home Builders/Wells Fargo Housing Opportunity Index indicates that housing affordability across the nation is at a 10-year low. Since academic medical centers (and thus critical care physicians) tend to be clustered in major metropolitan areas, rising housing prices and decreased affordability will probably lead to more physicians having to move further from work to be able to afford the cost of living. Therefore, the effects of longer commutes are likely to be felt more by subsequent generations of intensivists, and this may result in even worse levels of job satisfaction and burnout. Living further from the hospital may also impact the work environment in other ways; for instance, taking call from home may not be an option.

There are several steps that could be taken to ameliorate these effects. Medical centers could implement incentives to encourage commuting via bicycling or walking, which would have the additional benefit of decreasing demand for on-site

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# LITERATURE SURVEY

## “Did You See This?”

### Fluid therapy in neurointensive care patients: ESICM consensus and clinical practice recommendations.

Oddo M, Poole D, Helbok R et al.  
Intensive Care Med. 2018;44:449-463.

The European Society of Intensive Care Medicine (ESICM) recently published a consensus statement and clinical recommendations regarding the fluid management of neuro-intensive care patients (NIC), including comatose (GCS < 9) patients with severe traumatic brain injury (TBI), high-grade aneurysmal subarachnoid hemorrhage (SAH), severe arterial ischemic stroke (AIS) or intracerebral hemorrhage (ICH).

Regarding the composition of fluids, recommendations of varying strengths are summarized as follows:

- Isotonic crystalloids as the preferred fluid for maintenance and initial resuscitation of hemodynamic instability in NIC patients
- Hypotonic crystalloids and hypertonic sodium chloride, as well as colloids, including low- and high-concentration albumin are not recommended as maintenance or initial resuscitation fluid in hypotension

Recommendations regarding the hemodynamic guidance of optimization of fluid therapy include:

- Consideration of arterial blood pressure and fluid balance as the main end points of fluid management, and integration of variables such as cardiac output, SvO<sub>2</sub>, blood lactate, urinary output; central venous pressure is not recommended as the sole or safety end point.
- Weak suggestion for normovolemia as the target for fluid replacement and against restrictive fluid strategy in NIC patients although no specific comment is made regarding these suggestions in patients with elevated ICP.



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In elevated ICP, the fluid management recommendations are:

- The use of mannitol or hypertonic saline solution for reducing ICP
- The trigger for starting osmotherapy: the combination of neurological worsening (defined as a decrease of 2 points of the GCS motor score, or loss of pupillary reactivity or asymmetry, or deterioration of head CT findings) and ICP > 25 mmHg (strong recommendation); ICP > 25 mmHg independent of other variables (weak recommendation).
- Measurement of ICP response and serum osmolarity and electrolytes to reduce side effects of osmotherapy, as well as impact on arterial blood pressure and fluid balance as secondary variables.
- Limited recommendations are made regarding the endpoints of fluid management of SAH patients with delayed cerebral ischemia

- The main endpoints to be used are arterial blood pressure and reversal of neurological deficit.
- The secondary endpoints suggested are transcranial Doppler cerebral blood flow velocities, improvements of cerebral perfusion and reduction of mean transit time on CT perfusion

### A Randomized Trial of Epinephrine in Out-of-Hospital Cardiac Arrest.

Perkins GD, Ji C, Deakin CD et al; PARAMEDIC2 Collaborators.  
N Engl J Med. 2018;379:711-721.

This large multicenter, randomized placebo-controlled, double-blind trial of epinephrine vs saline in pre-hospital cardiac arrest aims to elucidate outcome effects of epinephrine administration. The primary outcome of 30-day survival was 3.2% in the epinephrine group vs. 2.4% in the saline group (adjusted OR 1.47; 1.09-1.97), with 112 the number needed to treat to prevent one death. Secondary outcomes analyzed were: hospital discharge with favorable neurologic outcomes, 2.2 % in the epinephrine vs. 1.9% in the saline (OR 1.19; 0.85-1.68); 3-month survival – 3% vs. 2.2% (OR 1.47; 1.08-2); favorable neurologic outcome at 3 months 2.1% vs 1.6% (OR 1.39; 0.97-2.01). While the overall survival rate in both groups was very low, the 30-day and 3 month survival was statistically significantly greater in the epinephrine group, and there was a significantly higher rate of ROSC -36.3% vs 11.7%, as well as survival to admission - 23.8% vs 8% (OR 3.83; 3.-4.43); however, the difference in the primary outcome was not as large as hoped, with NNT 112. This trial does not negate the role of

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epinephrine in out-of-hospital cardiac arrest; rather, it highlights other considerations in the resuscitation process, such as the complexity of the underlying pharmacophysiology, the focus on various aspects of the resuscitation interventions and their impact on outcomes beyond simple survival assessment, as well as on the end points of the resuscitation efforts.

### **Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599,912 current drinkers in 83 prospective studies.**

Wood AM, Kaptoge S, Butterworth AS et al; Emerging Risk Factors Collaboration/EPIC-CVD/UK Biobank Alcohol Study Group. *Lancet*. 2018;391:1513-1523.

This study by the an international consortium of data on 786 787 participants found a curvilinear positive correlation between alcohol consumption and all cause-mortality, with the lowest incidence below 100 gm/week. A positive linear

associations of alcohol consumption with stroke (HR per 100 g/week higher consumption 1.14; 1.10–1.17), coronary disease excluding myocardial infarction (1.06; 1.00–1.11), heart failure (1.09; 1.03–1.5), fatal hypertensive disease (1.24; 1.15–1.33), and fatal aortic aneurysm (1.15; 1.03–1.28). There was an inverse and approximately log-linear association of alcohol consumption with myocardial infarction (0.94; 0.91–0.97) after adjustment for other major risk factors. Alcohol consumption levels also had a inverse correlation with life expectancy, with the highest divergence in the 4th decade: at age 40, compared to the reported drinkers of 0–≤100 g (mean usual 56 g) alcohol per week, those who reported drinking >100–≤200 g (mean usual 123 g) per week, >200–≤350 g (mean usual 208 g) per week or >350 g (mean usual 367 g) per week had shorter life expectancy respectively of approximately 6 months, 1–2 years, or 4–5 years. The results suggest that for all-cause mortality and morbidity from some cardiovascular disorders, the threshold for the lowest risk is 100 gm per week, while for others there is no low threshold below which the risk association is eliminated, and for myocardial infarction, low level of alcohol has inverse risk correlation. 🏠

## WELLNESS SERIES **Sometimes, It’s About the Journey** *continued from page 11*

parking. Telemedicine may provide opportunities to work from remote locations rather than a centralized hospital. Some medical centers in urban areas could make use of direct-route bus charter services that provide enhanced amenities, such as comfortable seating and wireless internet, enabling employees to work or sleep during their commute; this strategy is already employed by numerous companies in the San Francisco Bay Area. Lastly, medical centers in the most expensive housing markets may need to provide financial support to defray housing costs, although this may not always be feasible.

Unfortunately, there is little data available on the effects of commuting on health care workers. While it would stand to reason that physicians and others who take call from home would value proximity to the hospital, it could also prove to be the case that workers in a high-stress field such as ours may place a greater value on distance from work (both mental and physical). At SOCCA, we are very interested in finding out more about how these issues affect our members and how we can best help them navigate their current work environment. We encourage you to answer the questions accompanying this article to provide us with more information. Feel free to access

them from your home computer between tele-ICU patients, your laptop while on a charter bus, or your smartphone while trying to maintain your balance on the train. All we ask is that if you are riding a bicycle or driving a car...please keep your eyes on the road! 🏠

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## COMMITTEE REPORT

# Membership Committee Announcement



**Stephen D. Surgenor, MD**  
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The SOCCA Membership Committee would like to welcome all of our current members, as well as, new Critical Care Anesthesiology faculty and fellows to the 2019 academic year!

Overall, our current membership remains strong. Maintaining a strong and engaged membership is important to the long-term health of SOCCA. We've been able to maintain this strong membership level because of you! Thank you!

The SOCCA Membership Committee is dedicated to not only increasing our Society's membership but also to evaluating and highlighting how we energize and improve current SOCCA membership offerings to meet the evolving needs of our members.

One of the key components in this process is the membership survey, which we hope all of you have recently received and completed. From the survey we hope to get honest feedback about how SOCCA can return more value to each of our members, whether it be providing you with assistance in your everyday critical care practice or by addressing, systematically, more complex issues such as ICU coverage models or the growth of your hospital's Critical Care Anesthesiology practice.

These are exciting times for critical care anesthesiologists. We are, in general, experiencing high demand for services while being asked to do more with less. In fact, members report an increasing desire to build or start critical care anesthesiology programs in medium-sized and smaller community hospitals that are trying to provide comprehensive care without the staffing and resources that are often available in larger academic medical centers and systems. SOCCA, its Membership Committee, and many others are evaluating ways to help you!



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We are working with other committees and leaders in our Society to grow SOCCA into the resource you utilize for many different administrative, clinical and educational issues and problems you encounter. If you have ideas, thoughts or suggestions to improve the way SOCCA interacts with the Membership, please feel free to contact any of the Membership Committee leadership, Steve Surgenor ([Stephen.d.surgenor@hitchcock.org](mailto:Stephen.d.surgenor@hitchcock.org)) or Carlee Clark ([clarca@musc.edu](mailto:clarca@musc.edu)). 



## CALL FOR LETTERS OF INTENT: Initiative for Multicenter Pragmatic Anesthesiology Clinical Trials' (IMPACT)

This award was established by leaders of academic anesthesiology organizations that recognized there was a need to conduct large pragmatic trials in order to answer important questions in anesthesiology-related research.

The call for letter of intents opened on Monday, October 1, 2018 and will close on November 16, 2018 at 11:59 pm EST. Please click [here](#) to access our online application portal and to view submission guidelines and details.

Visit [here](#) for more information on IMPACT.

## MEMBER HIGHLIGHT

# A Brief Conversation with...Jeffery S. Vender



**Jeff Vender, MD, MCCM, MBA is the Emeritus, Harris Family Foundation Chairman of the Department of Anesthesiology at NorthShore University HealthSystem in Evanston, Illinois and a Clinical Professor at the University of Chicago Pritzker School Of Medicine. Dr. Vender was the recipient of the SOCCA Lifetime Achievement Award in 2018.**

than life personality, and he challenged everyone who worked with him in the operating room. Jim influenced me to reach beyond clinical anesthesia to other important opportunities: leadership, scholarship, and professional engagements. Later in my life, I encountered two superb business school professors, Robert (Bob) Duncan and J. Keith Murnighan, who were both involved in teaching leadership and organizational behavior. They further inspired me to seek ways to participate in organizational change and leadership.

**Q. You have lectured extensively on the importance of leadership in medicine. Could you speak to its importance for critical care physicians?**

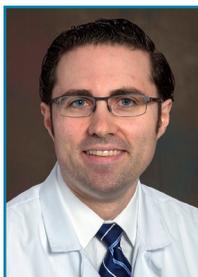
**A:** Leadership is important everywhere but especially so in an intensive care unit or operating room. These are high-reliability organizations where everyone must be engaged in their roles and have a sense of their own contribution to overall success, regardless of hierarchy or title. If you want a great intensive care unit it has to be built from the foundation up. To me that foundation means phenomenal nursing, and other key support staff, who are committed to patient-focused care and willing to go beyond boundaries. Championing education and developing interpersonal relationships further contribute to this foundation. We have a shortage of leaders in medicine, but leadership is critical when the stakes are high and the circumstances necessitate vigilance, competence, and passion for the care and treatment of the critically ill.

**Q. What influences early in your career led you to become a critical care anesthesiologist?**

**A:** My first exposure to anesthesiology was as a medical student where I was inspired and impacted by key leaders and mentors in the field. Barry Shapiro led the anesthesia critical care program at Northwestern, and he was a wonderful teacher, clinician, mentor (and friend) who demonstrated that critical care offered an appealing avenue of engagement and continuity of care beyond the operating room with patients, families, and other clinicians.

**Q. Many leaders in our specialty can typically point to a few key mentors during their careers who helped to shape their trajectory. How did you develop relationships with these individuals?**

**A:** I would first like to credit my mother and her unabashed positive outlook on life and unconditional love. She was unwavering in her belief that you could accomplish what you wanted with persistence and dedication. Professionally speaking, I had the opportunity to work with many great clinicians during training, including James Eckenhoff. Jim was a renowned anesthesiologist and the Dean of the medical school at Northwestern. He had a bigger



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**Q. What other factors do you think are responsible for this dearth of leaders in medicine?**

**A:** Medical school admissions are largely predicated on individual achievement and deemphasize traits that are of critical but difficult to quantify or extract from a CV: integrity, perseverance, passion, critical thinking, interpersonal skills, and so on. Physicians are often individualistic and, in contrast to high-performers in other domains, unaccustomed to a focus on teamwork. This can beget poor engagement in leadership roles and a failure to appreciate the importance of empathy, listening to understand, self-awareness, and self-regulation, which ultimately lead to effective leadership.

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## AWARDS

# Shubin-Weil Master Clinician/Teacher: Excellence in Bedside Teaching Award



Nicholas Sadovnikoff, MD, FCCM, will receive the Shubin-Weil Master Clinician/Teacher: Excellence in Bedside Teaching Award at the Society of Critical Care Medicine's (SCCM) 48th Critical Care Congress during the American College of Critical Care Medicine Convocation/SCCM Awards Presentation held on Monday, February 18, 2019.

The Shubin-Weil Master Clinician/Teacher: Excellence in Bedside Teaching Award honors an SCCM member who is a role model of excellence in both the teaching and ethical practice of critical care. The recipient should be someone who is not nationally or internationally well-known or whose name is not recognized for his/her research efforts.

The major criterion for selection of the award recipient is excellence in teaching, evidence of which is embodied in the accomplishments of the recipient's trainees. The recipient should have inspired his/her trainees as a role model of both clinical and teaching excellence. It is this greatness as a teacher—namely, the ability to inspire the next generation of clinician-teachers—that the Shubin-Weil Award honors. The recipient must also meet these criteria:

- Be an SCCM section member
- Have a combination of attributes that makes him/her a role model of excellence in both the teaching and ethical practice of critical care
- Have direct patient responsibilities
- Be recognized as an outstanding clinician/teacher who by example and leadership has substantially furthered the expert and appropriate use of life support interventions

## MEMBER HIGHLIGHT A Conversation with...**Jeffery S. Vender** *continued from page 15*

### **Q.** How can fellows and junior faculty, some of whom will seek out or be asked to assume leadership roles in critical care environments, evolve into effective leaders?

**A:** The first skill you need for leadership is competency, and for physicians this means initially allowing time for clinical development. Once you demonstrate clinical competency, leadership opportunities will often begin to emerge, and then developing leadership competency is key. Physicians are intelligent and not apt to follow an incapable leader. Leadership should not be about titles and additional income. It should be borne from a genuine interest in serving others. Identifying mentors is the first step. Reading, attending lectures of leadership and coursework are all next steps. One key early lesson is to appreciate the importance of personal growth: understanding weaknesses and strengths, seeking feedback to enhance self-awareness, and regulation of behavior. Effective leaders utilize the strengths of others, which is a challenge

for some physicians. Finally, never be afraid to ask for help. Seeking guidance too late is a common pitfall, which may lead to preventable adverse events.

### **Q.** Mentorship again emerges as a central theme here. What practical advice would you have for fellows or junior faculty who are struggling to identify mentors?

**A:** A mentor should be someone who you respect for all the right reasons, and they should command respect, not demand it. When opportunities within a department or division are sparse, get involved more broadly within the institution. Significant, rapid, or consequential change never happens successfully in the absence of effective leadership, because our inherent tendency is to resist change. If you place yourself in engagements where change is occurring, you will see if it is successful or not, which can offer the opportunity both to learn and identify mentors. 

# About SOCCA



The Society of Critical Care Anesthesiologists (SOCCA) is the sole organization dedicated to the continuation of the role of anesthesiologists in providing critical care services. You do not have to be an intensivist to benefit from membership in this organization. Critical care practices are utilized in the post anesthesia care unit, intermediate care unit, emergency department/trauma center as well as the intensive care unit. Practitioners with clinical case loads that are dominated by cardiac, neurosurgical, and transplant procedures may be frequently involved in the daily perioperative care of critically ill patients. Patients in all of these care areas may require aggressive monitoring and state of the art perioperative care. The continued enhancement of critical care services throughout the perioperative period is a founding goal of SOCCA.

## ADVOCACY

SOCCA is an educational organization that fosters the role of anesthesiologists as perioperative specialists and provides for continuing education and interchange of ideas

The Society provides representation for the practice of critical care medicine in the ASA House of Delegates

SOCCA provides input to the ASA and Society of Critical Care Medicine on key issues related to their advocacy for patient care and reimbursement

## BENEFITS OF MEMBERSHIP

Discounted pricing for the SOCCA Annual Meeting a forum for the specialist with broad-based interests, including respiratory therapy, postoperative cardiac surgical, neurological and transplant management, and trauma care

Discounted membership in the IARS, which includes access to two peer-reviewed journals-Anesthesia & Analgesia and A&A Case Reports, free journal CME, and eligibility to apply for IARS research grants

## FREE ICU RESIDENT'S GUIDE

Free quarterly newsletter Interchange, which covers ethically controversial issues, survey of practice patterns, and historical aspects of anesthesiology

## MEMBERSHIP LEVELS

### Active Member | \$160.00 / year

Active members shall be physicians who should be members of the ASA and have an interest in critical care medicine. Each Active member shall have one vote on any matter on which Active members are entitled to vote by law or that is submitted to a vote of the membership, and shall enjoy all rights and privileges of membership.

### Affiliate Member | \$110.00 / year

Affiliate members shall be physicians or scientists who are active in training programs or research relating to critical care medicine, but who do not fulfill the definition of Active member.

### Educational Members | \$25.00 / year

Educational members shall be residents or fellows in full-time training in an accredited school of medicine in the United States or abroad.

### Medical Student Members | Complimentary Membership

Medical Student members shall be individuals in full-time training in an accredited school of medicine in the United States or abroad.

### Retired Members | Complimentary Membership

Retired members shall be individuals who have been Active members of the Society for ten (10) or more years and have completely retired from professional practice.

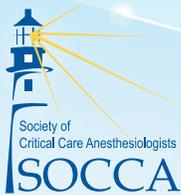
*Affiliate, Educational, Medical Students and Retired members shall have all rights and privileges of Active members, except that they may not vote, attend corporate business meetings (including, without limitation, the Annual Business Meeting) except by invitation, or serve as an officer or a director of the Corporation. Such members may serve on committees if requested by the Board of Directors.*

## MEMBERSHIP PROCESS

SOCCA membership does not require formal sponsorship and can be applied for online.

[Click here to Join.](#)

[Click here to Renew.](#)



# SOCCA Information

## EMAIL

Meetings: [SOCCAm meetings@iars.org](mailto:SOCCAm meetings@iars.org)

Membership information: [SOCCA@iars.org](mailto:SOCCA@iars.org)

**VISIT THE SOCCA WEBSITE at:**  
**[www.SOCCA.org](http://www.SOCCA.org)**

## MEMBERSHIP

Membership in SOCCA is open to all anesthesiologists who have an interest in critical care medicine; nonanesthesiologist-physicians and scientists who are active in teaching or research relating to critical care medicine; residents and fellows in approved anesthesiology programs; and full-time medical students in an accredited school of medicine.

## MEMBERSHIP BENEFITS

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**Renew or join today at [www.SOCCA.org/membership.php](http://www.SOCCA.org/membership.php)**

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### Fellowship Program Reviews

If you would like to contribute a review for a Fellowship Program at your institution in a future issue of the SOCCA Interchange, please contact: Vivian Abalama, CAE, IOM at [vabalama@iars.org](mailto:vabalama@iars.org).

### Editorial Policy

The opinions presented are those of the authors only, not of SOCCA. Drug dosages, accuracy and completeness of content are not guaranteed by SOCCA.

## CALL FOR ARTICLES



If you have an interesting case report, an idea for a pro-con discussion, a review idea, or an opinion on a recently published article, please submit your proposal/article to Vivian Abalama, CAE, IOM, at [vabalama@iars.org](mailto:vabalama@iars.org) on or before December 3, 2018. If your article is chosen for the newsletter, we will contact you for editing and formatting. Thank you.

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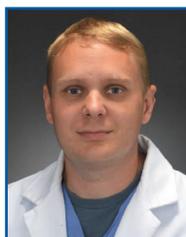
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