

INTERCHANGE

Society of Critical Care Anesthesiologists Newsletter Volume 35 | Issue 4 | December 2024

President's Message

I hope you all enjoyed your Thanksgiving holiday, it is one of my favorites. Thanksgiving comes without all the heavy expectations of other holidays, promising simply a good meal with the important people in your life. The premise is also a good one – reflection on what we can be thankful for.

What makes me thankful? I am fortunate to have a profession where I can influence lives, contribute to the future, and work in a team. One of our star trainees who is going into Critical Care Medicine recently astutely pointed out how valuable that team experience is. When I come to the ICU, I see familiar, friendly faces in the staff and new faces in the many different residents and medical students who rotate through. Over the course of a week, I watch this team become ever more efficient. Although working in the right operating room environment might bring some of these experiences, they are never the same and are not as richly fulfilling. There is something even more special in the ICU environment. I get to see the looks in faces that tell me when a learning concept takes hold during one of my lectures. Teaching is such fun. Plus, I get to learn and I am thankful to be able



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to solve complex problems alongside a team of experts.

If you are reading this, you are with SOCCA, and you know what a great, like-minded group of people we are. Have you thought about getting more involved? If so, stay tuned: there will be calls for volunteers and nominations for the Board of Directors coming out soon. If you haven't seen the fantastic work our volunteer groups do,

have a look at our website or reach out to our subcommittee chairs for more information. We all have something to contribute. Communications, education, membership, research, and clinical practice are a few of the big headings, with more subgroups working under each. If you have been involved in these groups, consider applying to be a Director of the Society. We are a great group to hang out with at meetings, so why not spend more time with us year-round? I am very thankful for the great work all these groups accomplish for SOCCA.

In the meantime, take a few moments to be thankful for being part of a great profession and specialty. Enjoy the rest of the holiday season! 🎄



**SOCCA
Calendar**
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Membership Committee Update

The SOCCA membership committee has been working to find new ways to reach out to the membership and solicit more feedback to continue to improve our society's offerings.

We conducted a membership survey in the early fall, which over 100 members completed. We want to thank each and every one of you for your time and honesty in your responses. Some of the highlights from the responses included:

- 1 – More in-person gatherings
- 2 – More CME offerings
- 3 – More acknowledgment of efforts on behalf of the Society

Watch for communications about meetups at SCCM, SCA, IARS, SNACC, ASA, and more in 2025! And we are happy to arrange meetups at other meetings as well. Please reach out to info@socca.org if you are planning to attend any other meetings where there might be a SOCCA presence.

The education committee is in the process of creating the 2025 Educational Calendar, and we are happy to announce that we will be offering CME for more of our webinars. We also want to make sure that we acknowledge the efforts of all our volunteers, so we will be making this a priority in 2025.

Our Job Fair this year was conducted in a new format and was a great success! For the first time, we were able to recruit sponsors for the event and gave attendees face-to-face contact with groups looking to hire critical care anesthesiologists. We want to thank our speakers, Dr. Louisa Palmer, Dr. Sarah Khorsand, Dr. Marguit Kaufman, and our sponsors: Mayo Clinic, Anesthesia Specialists of Bethlehem, Ochsner Health, University of Louisville, and Weill Cornell Medicine.

Despite some glitches, the event ran very smoothly. We look forward to a longer event next year to allow for more time in breakout rooms with potential employers!

Finally, our membership committee members took a more grassroots approach this year in reaching out to recently lapsed members to encourage them to rejoin the society - and many folks did! 2025 also promises a revamped mentorship program and more Early Career Intensivists and Physicians in Private Practice meetups! We hope to see you at our final meetups of 2024 on 11/21 and on 12/12. 🎉



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Communications Committee Update

The Communications Committee had a productive fall meeting – we met with our new members and brainstormed ideas to advance the committee’s agenda. Given the increased social media engagement with video-based content, our team worked with the Women in Critical Care group to create the SOCCA Spotlight for WICC members. The video series highlights the challenges and satisfaction a career in critical care can bring for women. Please check out the videos on the [WICC page](#).

Given the challenging environment of recruiting anesthesiology critical care fellows, our committee is also collaborating with the Program Director’s Advisory Council to create content to reach future trainees (medical students and residents). We greatly appreciate Dr. Azad, Dr. Hoyler, and Dr. Klick, our committee members, dedicating their time to this effort.

The committee is also working with other committee leaders and our staff partners in the SOCCA office to streamline the article solicitation process. Our Vice

Chair, Dr. Kyle Bruns, has diligently created article submission guidelines that will soon be featured on our website. The SOCCA office is also helping us build an online webpage portal where members and non-members can submit articles at any time for publication in the SOCCA Interchange.

In the Winter Issue of the Interchange, we have articles on current trends in the Anesthesiology Critical Care Fellowship Match, updates from the physiologically difficult airway task force, and much more. We hope you continue to share any projects and perspectives with SOCCA. Your participation is invaluable to the continued success of SOCCA, and we look forward to welcoming new voices and perspectives. Please follow us on [X @SOCCA_CritCare](#) and follow our new accounts on [Facebook](#) and [LinkedIn](#).



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Education Committee Update

As the New Year dawns upon us, the Education Committee would like to announce some exciting changes to the committee structure, as well as highlight some of the new offerings for the New Year. After the immensely successful integration of the SOCCA and IARS annual meetings in 2024, where we were able to incorporate three days' worth of critical care content along with a POCUS workshop, we are happy to share that the same model will be in place for the 2025 Annual Meeting in Hawaii. The Annual Meeting subcommittee had a monumental task of choosing educational content from the multiple proposals that they received and we are certain that the SOCCA membership will be very pleased with the critical care content at the 2025 Annual Meeting as well. The Annual Meeting subcommittee will continue their work with the grading of various critical care related abstracts, and we would like to request all members to consider submitting session proposals for the IARS/SOCCA Annual Meeting in Montreal in 2026.

The Board Review course has had another successful year. The Board Review subcommittee under the leadership of Drs. Talia Ben-Jacob and Satyapriya put on a two-session review course in late September which was very well attended. We are excited to announce that there are plans in place to overhaul the Board Review Course for 2025, and we will likely migrate to a live virtual format, wherein the content would be aired live, with panelists in attendance, to answer any questions that the audience may have. In addition, the sessions will be recorded, and the participants would have the option to access recorded content later at their convenience. The Board Review Subcommittee is working diligently to build a financial model for the Board Review course which in the past has been free, but with the new format would have a nominal fee to offset the operational expenses. The SOCCA Board Review course has been providing a high impact review of the most important topics to help our recently graduated fellows study for their Critical Care Boards, and with the new format, we are hopeful that it would be even more beneficial.

As in the past years, the Education Committee will continue to provide educational webinars to the SOCCA membership, and for 2025, the Webinar Subcommittee, under the leadership of Dr. Amit Prabhakar and Vice Chair, Dr. Javier Lorenzo is working with the SOCCA management company to provide CME credit for the webinar series. The goal is to provide four high quality educational webinars in 2025, with the option for SOCCA members to obtain CME credit free of cost for attending these webinars. We are eternally grateful for the expertise

within SOCCA membership and appreciate all the speakers and moderators who have contributed to the astounding success of these webinars and continue to do so.

For the year 2025, the Education Committee is on track to launching some new education initiatives with the help of newly formed corresponding subcommittees. The Virtual Education Subcommittee, led by Dr. Anna Budde is working on creating a comprehensive virtual repository of resident didactics, and is partnering with OpenAnesthesia (an online peer-reviewed platform with educational content relating to the fields of anesthesiology, critical care, and peri-operative medicine), to create critical care related content and ensure anesthesia trainees around the world have access to essential information for board preparation as well as the practical information they need while caring for critically ill patients. Dr. Budde also serves as the Associate Editor of the Critical Care section of OpenAnesthesia. Discussions are also underway to work with "Anesthesia Toolbox", an educational offering of the American Society of Anesthesiologists (ASA) to curate critical care education and curricular content for trainees. Currently, there is a significant gap in the educational content related to critical care being offered through these platforms, and this endeavor will provide an opportunity for SOCCA members to create high quality educational content related to critical care medicine for anesthesiology trainees.

Considering the lack of exam preparatory materials specific to the American Board of Anesthesiology (ABA) Critical Care Board Exam, a separate Question Bank subcommittee under the leadership of Dr. Emily Naoum has been formed. The Subcommittee has been tasked with the creation of a virtual question bank resource for fellows taking the ABA Critical Care Board Exam. We envision the SOCCA virtual Question Bank to be modeled on the recently launched virtual Question Bank by the Society of Cardiovascular Anesthesiologists (SCA), and



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discussions are underway with the SCA leadership, to seek their guidance and expertise in creating such a Question Bank, which would be the first (and only) specific resource for the ABA Critical Care Board Exam. In addition, the newly formed Journal Club Subcommittee, led by Drs. Aalok Katcha and Christopher Choi will be presenting Virtual Journal Club sessions, starting in February 2025. This will be a great opportunity for our fellows and junior faculty to present important research impacting clinical care and hear from experts within our organization

We would like to thank the SOCCA Board of Directors and the SOCCA membership for their unrelenting support and encouragement, as we embark on these educational endeavors in the coming year. All of this would not have been possible without the work of each and every member of the education committee, and we sincerely appreciate their enthusiasm and hard work. We would like to specially thank Ms. Jennifer Rzepka, for her help in making all these new educational offerings a reality. Lastly, we encourage anyone with interest in developing and creating new educational content for SOCCA to apply for Education Committee membership in the coming year. Happy New Year y'all! 🎉



SOCCA drip

SOCCA Drip is a new online platform that offers member-generated content, spotlights member achievements, and delivers relevant news and updates from the broader critical care community—more frequently than ever before.

- Our newsletter, *SOCCA Interchange*, will continue to highlight features from our members and news from within the organization.
- To reflect these changes, SOCCA's Main Menu has changed to include "Drip" under "News" on the main menu.
- All back issues of *SOCCA Interchange* are available [here](#).
- To explore contribution opportunities or share relevant professional or programmatic accomplishments, please contact the office: info@socca.org

Updates from the Physiologically Difficult Airway Task Force: Delphi Consensus Summary

In October of 2020, SOCCA formed a task force to champion the cause of physiologically difficult airway (PDA) management. As is familiar to critical care anesthesiologists, in the contemporary era of airway management the physiologic challenges posed by patients requiring tracheal intubation outside of the operating room with, for example, right ventricular failure, cardiovascular instability, or severe hypoxemia, often surpass the technical challenges associated with intubation itself. This clinical gestalt has been increasingly supported over time by large-scale observational studies, including INTUBE and INTUPROS. As an organization composed of experts in applied complex cardiopulmonary physiology, SOCCA and its membership were well-positioned to make substantive contributions.

A critical mass of literature has amassed over time such that we now have practical, evidenced-based strategies to help inform PDA management in certain aspects, such as optimizing pre-oxygenation. However, the literature remains lacking in many other critically important aspects. Along those lines, SOCCA's PDA Task Force identified an opportunity to develop expert consensus informed by a robust Delphi methodology to fill in these gaps, better inform practice, and identify areas for future research.

The PDA Task Force first conducted a literature review to identify clinical domains relevant to PDA management: definition/risk factors, team preparation and human factors, patient preparation and optimization, performing the procedure, and post-intubation care. Within these domains, Task Force members identified topics and questions key to clinical management, for which many have absent or limited evidence to inform best practice. The Task Force chartered a steering committee for the consensus effort, recruited an international expert panel, developed a survey tool, and then over seven Delphi rounds in 2023 identified areas of expert consensus and dissensus regarding PDA management.

The results of this effort were recently published in *Intensive Care Medicine*. A key point that emerged was an expert consensus definition of a PDA: one in which the patient's physiological and pathophysiological alterations increase the risk for complications during tracheal intubation and the transition to positive pressure ventilation. Hypoxemia, cardiovascular instability, right ventricular dysfunction, and increased intracranial pressure were felt to represent relevant pathophysiological alterations, whereas obesity and pregnancy were felt to represent relevant physiological alterations.

Key points for emphasis in different facets of clinical management are summarized below.

Team preparation and human factors
Appropriately designed checklists may reduce errors of omission and improve patient outcomes
The intubation team should consist of at least three healthcare providers, including two airway operators (one of whom should be experienced)
Training requirements should be well-defined and include simulation-based training
Patient preparation and optimization
Screen critically ill adults requiring tracheal intubation for both anatomic and physiologic difficulty
Hemodynamics should be optimized prior to tracheal intubation
Point-of-care ultrasound aids the assessment and management of cardio-respiratory compromise
Preoxygenation with non-invasive ventilation is preferred, and high flow nasal oxygen can be used to facilitate oxygen delivery during apnea



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Careful mask ventilation may be performed to minimize desaturation
Sub-anesthetic doses of sedative hypnotics to facilitate pre-oxygenation while maintaining spontaneous ventilation (i.e., delayed sequence intubation) can be considered in patients who would otherwise be difficult to pre-oxygenate
Performing the procedure
Modified rapid sequence intubation should be considered
Ketamine or etomidate are the preferred sedative hypnotic agents, and standard anesthetic induction doses of propofol should be avoided
Video laryngoscopy should be available and routinely employed during the first tracheal intubation attempt
A stylet or bougie should be routinely employed
Post-intubation care
Tracheal tube placement should be confirmed using waveform capnography with consistent rise in amplitude during exhalation, with decline during inspiration, over at least seven breaths
Fluid responsiveness should be re-evaluated using dynamic indices before fluid administration in patients who develop hemodynamic instability
Invasive vascular access should be established in patients who develop persistent hemodynamic instability
Sedative hypnotic infusions guided by clinically assessed sedation depth should be used to reduce the risk of accidental awareness with recall in patients who received neuromuscular blocking agents

Figure 1 graphically depicts both the definition of, risk factors for, and elements in the management of the PDA.

It is also important to emphasize that dissensus and/or disagreement among experts was also identified in several areas, including: the definition of an experienced airway operator, the role and management of cricoid pressure, the optimal video laryngoscope design (e.g., conventional versus hyperangulated), and the importance of routinely reversing neuromuscular blocking agents after tracheal intubation. Apart from these domains, the need to further appraise interventions to prevent cardiovascular collapse—the most common physiologic complication associated with tracheal intubation in critically ill adults—emerged as an important area for future research as current evidence is markedly lacking to adequately inform our clinical practice. Work will also be needed to further bridge the implementation gap between identified best practices and the bedside, including identifying barriers to the universal availability and application of video laryngoscopy in this patient population, developing optimal approaches to the application of point-of-care ultrasound, PDA curriculum development, and adaptation to resource limited environments.

On behalf of SOCCA's PDA Task Force, we would like to extend a token of thanks to all SOCCA members who made this work possible, including Task Force members and those who participated as experts in the consensus effort. 🏠

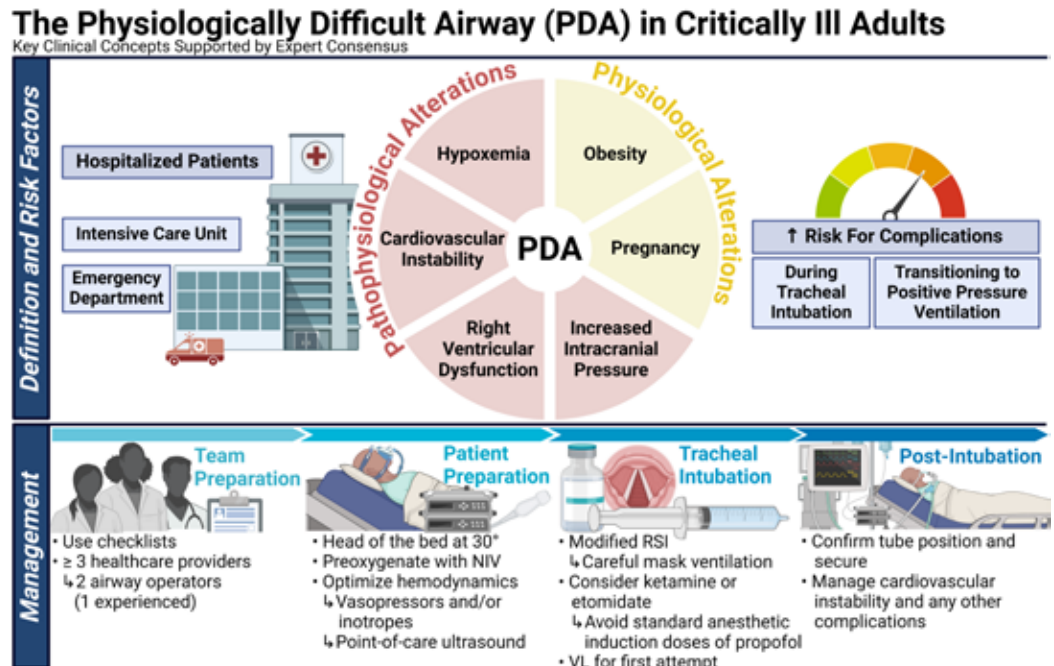


Figure 1: The physiologically difficult airway in critically ill adults: key concepts.

Reprinted with permission from Karamchandani, K., Nasa, P., Jarzabowski, M. et al. Tracheal intubation in critically ill adults with a physiologically difficult airway. An international Delphi study. *Intensive Care Med* (2024). <https://doi.org/10.1007/s00134-024-07578-2> Copyright © 2024, Springer-Verlag GmbH Germany, part of Springer Nature

Created with BioRender.com. NIV mask adapted from The OpenCriticalCare.org Project under a Creative Commons 4.0 International license. NIV non-invasive ventilation (i.e., pressure support with positive end-expiratory pressure), RSI rapid sequence intubation, VL video laryngoscopy

Does the 2024 Anesthesiology Critical Care Fellowship Match Reflect a Sustained Decline in Interest in Our Subspecialty? A Closer Examination of Historical Trends

As the 2024 fellowship match cycle draws to a close, critical care leaders and stakeholders face a concerning reality. Data from this year's match once again highlight trends that mirror the previous cycle, with 36% of anesthesiology critical care fellowship positions going unfilled (Figure 1). This persistent gap raises an urgent question: does this pattern signal a sustained decline in interest in our subspecialty?

While a preliminary examination of historical trends suggests the possibility of further stagnation or decline heading into 2025, a deeper analysis reveals that the situation may be more complex. Over the past decade, anesthesiology critical care has seen a substantial increase in training capacity, with fellowship positions expanding to meet anticipated clinical demand. Yet, despite this growth, the number of applicants has not risen proportionally. This imbalance underscores a critical challenge for the subspecialty, demanding a thoughtful reassessment of how it is positioned within the broader framework of anesthesiology subspecialty training programs.¹

A Decade of Growth with Unmet Potential

Between 2014 and 2024, the number of anesthesiology critical care fellowship positions expanded from 150 to 226, while the number of participating programs increased from 47 to 64. Despite this growth, the applicant pool has remained relatively static, rising only slightly from 147 in 2014 to 156 in 2024. A temporary spike in interest during the COVID-19 pandemic in 2021 and 2022 brought brief hope of a sustained upward trajectory. However, this interest

has since plateaued, reflecting an ongoing challenge in attracting new trainees.

While the data does not point to a dramatic decline, it does suggest a concerning trend: a growing mismatch between the number of available positions and the number of interested applicants. This disparity raises critical questions about whether the field is doing enough to attract and retain future intensivists. Factors such as the demands of the specialty, perceived work-life balance, and the emotional toll of caring for critically ill patients may all play a role. The stagnation in applicant numbers suggests a need for a deeper examination of how intensive care medicine is perceived by today's trainees and whether more can be done to promote the benefits and opportunities inherent in the field.



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Comparisons with Surgical and Pulmonary Critical Care

The trajectory of the anesthesiology critical care training landscape is particularly striking compared to the growth observed in surgical critical care fellowships. From 2014 to 2024, the number of surgical critical care fellowship positions rose from 143 to 340, alongside a 204% increase in applicants, from 95 to 289.¹ This notable rise aligns with the broader implementation of the acute care surgery model, which has replaced traditional call schedules with a more predictable and structured work environment. The appeal of predictability and a clearer career pathway appears to be highly valued by prospective applicants.² Moreover, surgical critical care has benefited from an expanding scope of practice and better integration with trauma surgery, making it an attractive option for those seeking a diverse clinical experience. Similarly, pulmonary and critical care medicine programs have also fared better, likely due to their dual focus on pulmonary and critical care, offering a broader range of career options and the flexibility to tailor one's career to specific interests.³

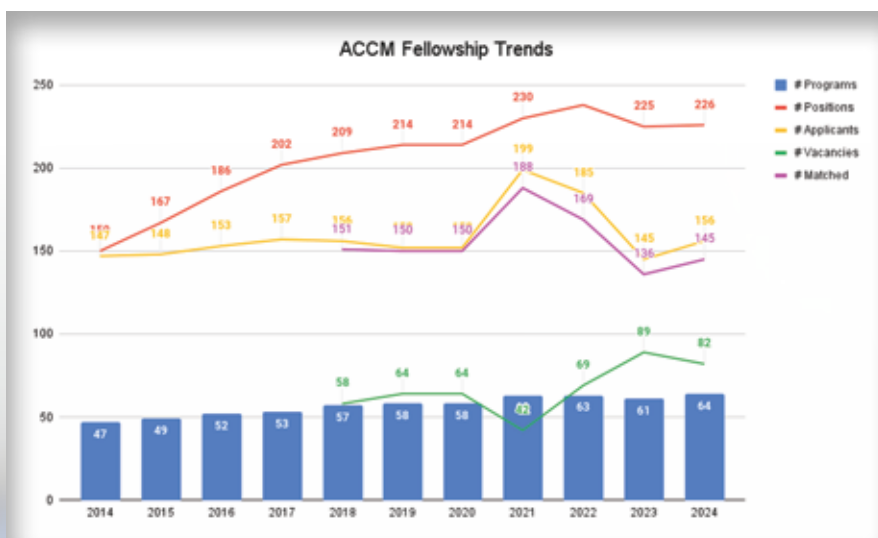


Figure 1: ACCM Fellowship Trends

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Opportunities for Renewing Interest

Given these trends, it is imperative to consider strategies to enhance the appeal of anesthesiology critical care medicine. As our specialty increasingly adopts shift work models with dedicated daytime and nighttime intensivists, we have an opportunity to address the perceived lack of work-life balance and enhance our appeal to trainees. Additional potential strategies might include re-evaluating fellowship structures, promoting the diversity of practice opportunities within critical care, and highlighting unique aspects of the specialty that align with evolving trainee priorities—such as the impact of multidisciplinary care, technological advancements, and the pivotal role of anesthesiologist intensivists in shaping patient outcomes in the perioperative period. Additionally, engaging medical students and residents early in their training through targeted outreach, mentorship programs, and shadowing opportunities could inspire interest and clarify misconceptions.

In conclusion, while the current trends do not confirm a dramatic decline in interest in anesthesiology critical care, they underscore an urgent need for action. Stabilizing and growing the applicant pool will require addressing perceived barriers and amplifying the specialty's unique strengths. By adapting to the evolving priorities of today's trainees, anesthesiology critical care can position itself as a dynamic, rewarding, and impactful career choice. 🏆

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2024 S O C C A
WEBINAR SERIES

Women in Critical Care Update

We're excited to introduce the new leadership team for the Women in Critical Care (WICC) group! First, we extend our heartfelt thanks to Drs. Siddiqui and Hua for their dedication in establishing and leading WICC. As we take up the mantle, we are eager to continue building on their efforts.

- **Dr. Joy Lo Chen** is an anesthesia intensivist at UT Southwestern Medical Center. Outside of work, she enjoys chauffeuring her two kids to soccer and gymnastics, as well as indulging in sewing and resin crafting.
- **Dr. Kirsten Steffner** is a cardiac anesthesiologist and intensivist at Stanford University in Northern California. She loves exploring the Bay Area with her two young kids and spending time outdoors.
- **Dr. Beth Teegarden** is an anesthesia intensivist at the University of Texas Medical Branch. When not working, she and her husband stay busy with their two girls and two dogs.

It was wonderful to see so many familiar faces – and meet new ones – at the WICC and Early Career Intensivist Meetup during the recent ASA meeting. With over 20 attendees this year, we're excited to see this event grow in the years to come! If you missed it, don't worry – there are plenty of opportunities to connect. Join us in 2025 at the SOCCA socials during SCCM Congress, the SOCCA/IARS Annual Meeting, and at ASA.

Also, you may have noticed something new at ASA this year: SOCCA WICC flair for your badge! Be sure to pick up a badge ribbon at future meetings and help spread the word about our group.

Since our last update, we hosted an engaging **Fireside Consultancy** in August – a casual virtual event where participants discussed professional challenges and shared



advice in a structured, supportive format. Don't miss our upcoming virtual WICC events in January, April and July. Keep an eye on your inbox for email announcements!

Our mission remains steadfast: to create a community of mentorship, sponsorship, and support that promotes the wellness, recruitment, development and advancement of women in critical care anesthesiology.

This year, our goals include:

- Growing the WICC community.
- Increase member engagement in SOCCA.
- Hosting meaningful events to support and uplift our members.

Help us expand our network! Visit <https://socca.org/women-in-critical-care/> to express your interest and learn more. We look forward to seeing you at future events and welcoming you into the WICC community! 🙌



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Program Director Q&A

Sarah M. Alber, MD is a cardiothoracic anesthesiologist and intensivist in our cardiothoracic intensive care unit at the University of Colorado. I serve as the Program Director for our Anesthesiology Critical Care Medicine (ACCM) Fellowship, and our innovative 5-year Combined Anesthesiology Residency and Critical Care Medicine Fellowship which fosters critical care education over the entire program and integrates fellowship training over the final 24 months of training. My non-clinical time focuses on fellow education in critical care, career development, and critical care focused transesophageal echocardiography. I am an active member of SOCCA, and serve on the SOCCA Women in Critical Care Steering Committee.

Dr. Pannu: What are some of your favorite parts of being a critical care medicine fellowship program director?

Dr. Alber: Each year I am energized by the enthusiasm, curiosity, and passion of our fellows. What I most enjoy about being a program director is the opportunity to mentor and encourage our burgeoning intensivists to develop a growth mindset, creating a safe culture to ask questions and understand what underlies our knowledge and thought processes when managing critically ill patients. In doing so, our discussions promote questions that then trigger ideas. These ideas are the spark for the next research topic or QI project, or the development of a new curriculum. Our fellows are the future leaders of our field, and I am excited and honored to play a role in their development.

Dr. Pannu: What are some challenges program directors are facing today?

Dr. Alber: The biggest challenge in the post-pandemic era is the waning interest for residents in pursuing fellowship training. The ACCM fellowship has been particularly hard-hit, and many programs are unfilled. While the job market outside of the ICU is gaining new graduates at high rates, what the fall-out of this will look like for the future of our sickest patients is alarming.

As Mary Dale Peterson so inspiringly described at this year's Rovenstine Lecture of the ASA Meeting, the anesthesiology community stood up as a voice of safety and "ran towards the fire" as leaders in the emerging pandemic alongside our emergency medicine colleagues. ACCM intensivists were essential in providing bedside care, developed methods to turn anesthesia machines into ICU ventilators, supported non-intensivist colleagues in principles of critical care, and provided procedural expertise, to name just a few of our many crucial roles.

With the current recruitment challenges, the fallout of too many patients and not enough intensivists - particularly outstanding anesthesiology critical care intensivists - is concerning. Burnout, workplace stress, social and emotional demands in complex multidisciplinary ICU environments, and a need for work-life balance is a reality we all know. It is apparent to our rising medical students and residents. They see our struggles. However, we know our unique skill set and the essential role we play in critical care. Let's use this challenge to tap into our anesthesiology roots, to ask questions, to find new ideas, and reshape critical care into to a career that our rising generations are inspired and excited to pursue.

Dr. Pannu: What advice would you give to medical students and residents considering a career in critical care medicine? What is something you wish you had known?

Dr. Alber: Helping someone in need remains one of the most rewarding aspects of my professional life. Sometimes that person is my patient, working in unison with our ICU team to pull them back from a life-threatening illness. Sometimes it is bringing a warm blanket to a mother at the bedside, who is ignoring their own needs while expending all their energy towards helping their child. Other times it is a fellow having a "light bulb" moment as pathophysiology and management connect, even when the patient didn't read the protocol. These are usually instances spent in less public forums than rounds and can be during my patient visits, in a lull on an overnight call, or when chatting with a fellow after rounds.

I also do not live in the ICU. As an attending my schedule varies from 1-7 days in the ICU, then I go back to the cardiac ORs for a few days, or I have time to work on academic or administrative projects. The resident and medical student



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ICU rotation is not usually reflective of what a career in ACCM is like.

For residents and medical students considering critical care, seeking mentorship and opportunities to shadow an attending outside of a formal ICU rotation gives an insightful view into what life as an intensivist and anesthesiologist is like. The camaraderie and support of a team, the importance of communication and collaboration in administrative and educational missions, and the ability to affect change to improve outcomes is not as apparent within the confines of a 2- or 4-week rotation.

Dr. Pannu: *What are some advances you foresee in the practice of critical care medicine? What role do you foresee critical care anesthesiologists and SOCCA playing?*

Dr. Alber: While medicine has lagged behind many professions in prioritizing work-life balance, it is time that

we address this need in the ICU head on. This change is an expectation of our rising medical students and residents. Rather than insisting on the status quo, let's adapt. Let's be innovators in our field to develop new ICU models, non-traditional coverage schedules, and innovate advances in medicine and technology to improve access to high quality critical care for our patients, and improve balance and career longevity for our intensivists.

Anesthesiologists are creative, observant, thoughtful, and accustomed to running towards a problem. We have revolutionized perioperative care and leveraged our collective knowledge to make the operating room a much safer space. As critical care anesthesiologists let's leverage our collective experiences and ideas through societies like SOCCA to find new ways to optimize critical care, to foster our collaborative team for fulfilling and balanced careers, and inspire the next generation of medical students and residents to pursue critical care training for the best outcomes for our patients. 🏠

SOCCA MENTORING PROGRAM

SOCCA's mission is to support the development of anesthesiologists who care for critically ill patients. Recognizing the key role of mentorship in development, SOCCA is thrilled to offer mentorship resources to its membership.

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Continuous Glucose Monitoring in the Perioperative Period

Introduction

Substantial research has confirmed a critical link between perioperative glucose levels and perioperative complications including death.¹⁻³ Hyperglycemia has been found to be the main culprit and affects 20-40% of postoperative patients and up to 80% of patients having cardiac surgery, though hypoglycemia is equally dangerous.^{1,2} Regardless of a preexisting diagnosis of diabetes mellitus (DM), higher glucose is an independent predictor of mortality for patients having cardiac surgery.⁴ In fact, a new diagnosis of hyperglycemia has been associated with three times higher mortality in ICU patients as compared to those with euglycemia or previously diagnosed diabetes.² Further, an independent association has been identified between mortality and glycemic variability, regardless of mean glucose.⁵⁻⁷ Importantly, it has been shown that improved glucose control improves clinical outcomes and mortality in cardiac surgical patients.⁸

As a result, tight blood sugar control via intensive insulin therapy (IIT) has previously been investigated. A landmark trial in 2001 by van den Berghe and colleagues showed a reduction in morbidity and mortality in SICU patients by nearly half with use of IIT. This ushered an era of intensive insulin therapy and tight glycemic control (target blood sugar <110mg/dl) in critical care units worldwide.⁵ However, subsequent multicenter trials were aborted due to high rates of hypoglycemia and the inability to reach intended glycemic targets.^{9,10} Most notably, the NICE-SUGAR trial showed an unexpected increase in mortality with tight glucose control, essentially eliminating acceptance of and investigation into this practice.¹¹ Currently, most organizations' guidelines support a goal blood glucose of 140-180 mg/dL.¹²⁻¹⁴

Notably, despite being the standard of care in most ICUs, fingerstick capillary point of care (POC) glucose monitors have poor accuracy in critically ill patients compared to arterial or venous samples.¹⁵ Further, the current standard of intermittent glucose monitoring, regardless of the source, leaves significant opportunities for undetected perturbations.¹⁶ Given these issues, efforts have been made to improve glucose monitoring, particularly in critically ill patients. Some investigators have proposed that glucose should be continuously monitored as the "fifth vital sign."¹⁷

Wearable Monitoring Devices

Wearable medical devices are frequently encountered in ambulatory and medical settings and range from non-invasive portable blood pressure and pulse oximetry meters to adhesive ambulatory telemetry monitors and even subcutaneous medication infusion pumps. In the inpatient hospital setting, particularly the non-ICU ward, non-invasive continuous monitoring via wearable devices has shown

tremendous promise in minimizing the gaps in vital sign acquisition seen with traditional intermittent monitoring protocols. More importantly, "wearables" have the potential to substantially reduce patient harm through earlier recognition and intervention of frequently missed hypotension, tachycardia, and opioid-induced respiratory depression.¹⁸⁻¹⁹ As such, it is no surprise that diabetes technology has evolved to include patient-applied wearable devices; in many ways, this field has set a precedent for reliable, valid, minimally invasive monitoring and management devices.²⁰

Continuous Glucose Monitoring Technology

After over a century of more crude methods to assess glucose in the urine, glucose-oxidase reaction-based technology completely transformed glucose monitoring technologies in the 1960s with the advent of the first blood glucose test strip.^{20,21} Despite this, self-monitoring technology for patients using fingerstick glucose measurement became reliable and widely applied in the late 1970s, and understandably remains a challenge for patient adherence.^{20,22} Continuous glucose monitoring (CGM) technology emerged predominantly as an intravenous technology, primarily facilitated by microdialysis systems.²⁰

Unfortunately, this system is cumbersome, not portable, and depends on continuous blood extraction via an intravascular cannula, and thus was only applicable to the surgical or critically ill patient.²³ Subsequently, the first wearable sensors only lasted 72 hours, with fingerstick calibration needed every 6 to 12 hours, and glucose data collected and reviewed retrospectively by a physician, thus not viewable to the patient nor reliable for real-time treatment decisions.²²

With serial improvements from these early devices, CGM technology became relevant for the outpatient setting for patients, initially for those with type 1 DM. Since the



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Food and Drug Administration's (FDA) approval of the first implantable CGM device in 1999, the technology has facilitated closer monitoring for patients and their physicians and improved medication compliance and patient satisfaction.^{22,24} More importantly, they have reduced patient HbA1c levels and time out of range in type 1 and now type 2 DM populations, leading to better outcomes.^{22,25-27} In fact, real-time CGM devices are now the standard of care for patients using insulin infusion pumps or multiple daily injections of insulin as a Grade A recommendation within the Standards of Care for Diabetes Technology by the American Diabetes Association.²⁴ More recently, integration with smartphone applications and subcutaneous insulin pumps has dramatically changed the landscape of blood sugar management, facilitating instantaneous and remote monitoring as well as closed-loop automatic insulin delivery systems meant to mimic an "artificial pancreas."^{22,28}

Wearable CGM technology includes a subcutaneous sensor, a transmitter, and a receiver or monitor.²² Whereas the first wearable CGM device required tethering between the sensor/transmitter and receiver with tubing, modern devices typically use Bluetooth technology to facilitate wireless communication between the transmitter and CGM device.²² Over time, improvements were made to allow patient glucose visualization prospectively, then instantaneously and, later still, continuous glucose data with shorter warm-up periods, fewer or no calibrations, longer wear times (up to 14 days for non-implantable devices) and increasing types of alarms to alert users to acute or projected episodes of hypo- or hyperglycemia.^{21,22} While modern versions of the original intravascular CGMs are more accurate than the subcutaneous counterparts, their invasive nature and lack of portability are significant limitations to their clinical applications.¹⁶

While scattered work examined the utility of wearable CGMs in the inpatient setting, the Coronavirus Disease 2019 due to the SARS-CoV-2 infection pandemic facilitated a tremendous opportunity for broader CGM application. To minimize patient-provider contact and thus demands on personal protective equipment at the peak of the pandemic, the FDA exercised enforcement discretion under a plan for medical devices that allowed the temporary use of CGM in hospitalized patients.²⁹ Subsequently, studies examined CGM utility in both the inpatient wards and intensive care unit settings.³⁰⁻³² Limiting their applications, however, the predominance of these studies were small and observational, with many retrospective reviews.

Continuous Glucose Monitoring Devices in Hospitalized Patients

Studies of non-ICU patients have revealed that CGMs reduce the incidence of hypoglycemia and hyperglycemia.^{17,33} Unfortunately, several randomized controlled trials of CGMs in critically ill patients found inconsistent reductions in the

incidence of hypoglycemia.³⁴⁻³⁶ However, these studies had small and highly variable patient populations and insulin management strategies, which likely significantly impacted study outcomes.³⁷ Further, while presumably improved glycemic control and prevention of hypoglycemia via CGMs should improve patient outcomes, studies have not consistently demonstrated this.^{23,37} Nonetheless, a recent meta-analysis of insulin administration guided by CGM recently demonstrated reductions in hypoglycemia (RR 0.35), glucose variability, infection (RR 0.21), and mortality (RR 0.54) across 19 studies of critically ill adults.³⁷ Notably, the maximum number of patients in a single trial examined in this meta-analysis was 174, with a median of only 24 patients.³⁷ On top of reduced patient discomfort by reducing or eliminating hourly POC testing for patients on insulin infusions, CGMs have also been shown to reduce nursing staff workload.^{34,37-39}

Sensor accuracy in critically ill and surgical patients remains a question and primary barrier to the broader application of CGM in the hospital setting. Subcutaneous readings from the interstitial fluid lag behind blood levels due to glucose transport by as much as 20 minutes, which may be dangerously late in patients experiencing wide glucose swings.⁴⁰ Tissue malperfusion due to hypotension, hypothermia, hypoxia, acidosis, and electrolyte disturbances, which frequently exist in critical care and major surgery, may impede or inhibit appropriate sensor capture.^{24,41} Further, signal loss, presumably due to electromagnetic interference during surgery, has been reported.^{23,42,43} Historically, alongside the local vasoconstrictive effect of vasopressors, interference from multiple medications, including acetaminophen, heparin, ascorbic acid, and others, decreases the reliability of CGM sensors.^{23,24} However, several small series have shown no impact of vasopressors⁴³⁻⁴⁵ and modern sensors are designed to minimize or eliminate medication effects.⁴⁶ As such, multiple studies using more contemporary CGMs demonstrate acceptable device accuracy in ICU and surgical patients regardless of these possible interferences.^{23,30,43,47}

Continuous Glucose Monitoring in the Intraoperative Period

Studies explicitly examining intraoperative CGM applications represent a small fraction of the literature. A recent scoping review by Lim and colleagues identified only 22 studies, of which five focused exclusively on neonates or children.⁴⁸ Of these, only two were randomized controlled trials. The largest adult study population was only 76 patients, with a median of only 22 patients.⁴⁸ Notably, only one study met accuracy metrics for CGMs, including guidelines from the International Organization for Standardization, Clinical and Laboratory Standards Institute, and the FDA, largely limiting these devices to only experimental applications in this setting.⁴⁸

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Conclusions

Continuous glucose monitoring has profound potential to improve the care and outcomes of patients with dysglycemia in the perioperative period. Unfortunately, to this point, research has demonstrated inconsistent conclusions regarding its safety and application, mostly limited by small studies with marked variability in glucose and insulin management protocols. As such, tremendous opportunity exists for more robust randomized-controlled trials to assess CGM technology in the perioperative period effectively.

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All the Red Herrings

My greatest fear is having a case I was involved in presented at M&M. Like the inevitability of a wet tap, I could not avoid the experience, but I still find myself wondering what exactly happened to this patient.

68-year-old male with an incidentally found aortic aneurysm underwent a total arch repair with grafting of the innominate artery, left carotid, left subclavian artery, and a single vessel bypass grafting of the posterior descending artery. The patient had a past medical history of coronary artery disease, hypertension, hyperlipidemia, hepatitis-B, chronic kidney disease stage 3a, and prostate cancer status post prostatectomy. Total cardiopulmonary bypass time (CPB) was 151 min, with an aortic cross-clamp time of 104 min and a deep hypothermic circulatory arrest time of 49 min. His pre-operative echocardiogram showed a dilated ascending aorta and normal biventricular function with 1+ tricuspid regurgitation. Post-CPB TEE right ventricular inflow image below after chest closure on 0.125 mcg/kg/min milrinone showed normal RV function. In a Doppler image, tricuspid regurgitation was graded 1-2+.



Image 1: Transesophageal Image

The patient was fluid-resuscitated in the ICU and extubated on postoperative day 0. His right ventricular filling pressures remained in the 5-10 mmHg range. On POD1, after a posterior pericardiectomy chest tube was removed, he became hypoxemic and was found to have bilateral pneumothoraces on chest x-ray.



Image 2: Chest X-ray

Bilateral pigtailed catheters were placed, and the patient was stabilized on a nasal cannula. Later in his ICU course, he became acutely hypertensive, requiring nicardipine and nitroprusside drips to maintain SBP < 130 mmHg. He was on nifedipine and gradually increased to his home dose of 90 mg. On postoperative day 2, he was transferred to the step-down unit with pigtailed catheters in place after being weaned from vasoactive support.

Within 4 hours in the step-down unit, the patient was hypotensive with systolic blood pressure in the 70's. ABG showed hypoxemia with a PaO₂ of 51 mmHg. POCUS was performed, showing robust LV function and mildly diminished RV function without dilation. An arterial line was placed and norepinephrine infusion was started stabilized at a dose of 12 mcg/min. The patient was noted to be volume responsive, and one liter IV crystalloid was administered, at which point the patient was transferred back to the ICU.

Central line and Swan Ganz catheter were inserted, and initial reading showed cardiac index of 2.55, flat CVP of 25, PA pressures of 37/20. Chest x-ray for confirmation of line placement showed small right apical pneumothorax but no signs of pneumopericardium. Mean arterial pressure continued to fluctuate, at which point patient was started on a vasopressin infusion at 2.4 units/hr and epinephrine infusion at 2 mcg/min. Patient was noted to become increasingly hypoxemic and was intubated, at which point a TEE was performed. The TEE showed a collapsed right atrial wall and interatrial septum bowed towards the left. The decision was made to go back to the OR out of concern for cardiac tamponade.

In the OR, with the chest opened, the CVP decreased from 23 to 11 in a matter of minutes, and mean arterial pressure improved. However, no fluid collections or clots were found in the pericardium or adjacent to the pericardium. Given the persistent pneumothorax, the pleural spaces were closely examined and bilateral 24 Fr tubes were placed. A bronchoscopy and an EGD were performed, and no evidence of aerodigestive disease was found.

Upon chest closure, TEE noted that the right ventricle function became moderately diminished and tricuspid regurgitation increased from 1+ to 3+. Nitric oxide was started and milrinone was started at 0.25 mcg/kg/min.



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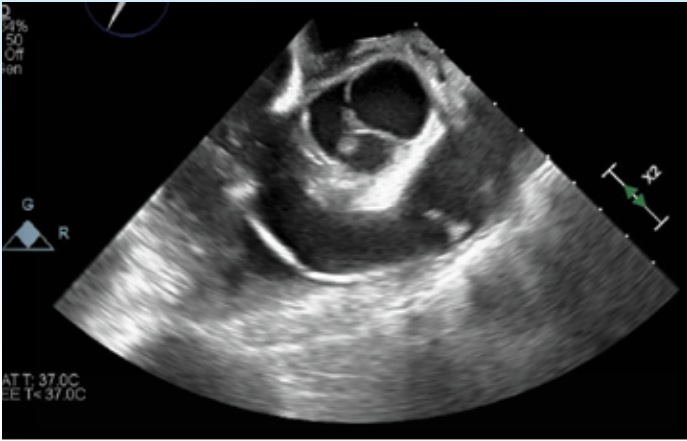


Image 3: Transesophageal echocardiography post chest closure

The patient was extubated by the following morning after takeback. His inotropes were gradually weaned, and his chest tubes were removed on sequential days, with no recurrence of pneumothorax. He was discharged from the ICU on POD7 and discharged from the hospital on POD10.

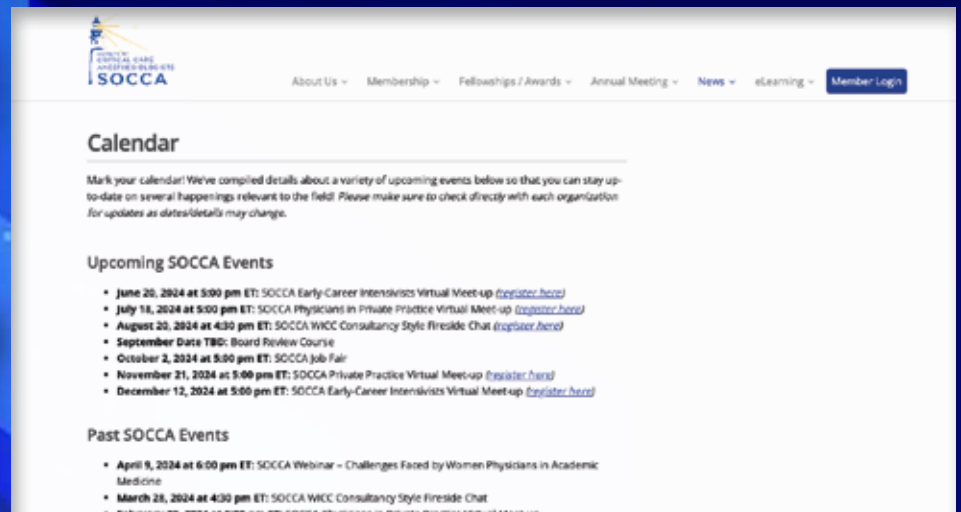
Was the persistent small pneumothorax relevant for this patient? Was it more significant than it appears on CXR? Though he showed signs of tamponade physiology, no tamponade etiology was found in the OR. Or was this a matter of tamponade of space given a relatively small chest size? The third theory is that the patient went into right ventricular failure from an inotropic wean and IV fluid administration. However, this explanation does not fully account for his decompensation on the floor.

Unfortunately, not every event has a denouement. Thankfully, the patient's hemodynamics improved, and he was eventually able to return home. In the absence of signs of aerodigestive disease, it is hard to pinpoint a diagnosis, representing the unsatisfying part of this case. But perhaps that is part of the learning curve of being an early-career intensivist—that not everything fits into Occam's razor after all. The second teaching point may be that we are not as alone as we think we are—when this patient decompensated, everyone from respiratory therapy to nursing to surgery was on board to help him. Because of a collaborative team effort, he survived. 🙏



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Seraph® 100 Microbind® Affinity Blood Filter and Use in Group A Streptococcus Sepsis: A Case Report

Abstract:

The Seraph® 100 Microbind® Affinity Blood Filter (Seraph 100) is a single-use extracorporeal broad-spectrum sorbent hemoperfusion device authorized by FDA under Emergency Use Authorization (EUA) for multi-organ failure in COVID-19. According to recent studies, the filter has been shown to decrease morbidity, mortality, and intensive care unit (ICU) length of stay (LOS) in both adult and pediatric populations and has mainly been assessed for its efficacy in the management of COVID-19. Use of the Seraph 100 Microbind Affinity Blood Filter is only available under EUA. Here, we present a case of a 26-year-old female who developed septic shock and disseminated intravascular coagulation (DIC) secondary to Group A Streptococcus infection. The Seraph 100 Filter was utilized on the 3rd day of her ICU admission. Her shock state resolved in less than 24 hours after utilizing the Seraph 100 filter. Although her length of stay was prolonged due to complications secondary to DIC, use of the Seraph 100 filter was instrumental in helping her survive her critical illness. This case provides an example of how the Seraph 100 filter can be a useful tool for critically ill patients with multi-organ failure secondary to infectious causes other than COVID-19.

Introduction:

The Seraph® 100 Microbind® Affinity Blood Filter (Seraph 100) is a single-use extracorporeal broad-spectrum sorbent hemoperfusion device authorized by FDA under EUA. Indications for use include laboratory-confirmed and symptomatic COVID-19 and life-threatening diseases defined as respiratory failure, septic shock, and/or multiple-organ dysfunction or failure. According to recent studies, the filter has been shown to decrease morbidity, mortality, and ICU length of stay (LOS) in both adult and pediatric populations with COVID-19 [1] [2]. To our knowledge the Seraph 100 filter has not been used as an adjunct therapy in managing septic shock due to Group A *Streptococcus*.

Case Report:

A 26-year-old (G1P0) female presented to the Emergency Department (ED) in active labor. She was 39 weeks and 3 days pregnant. She had an uncomplicated vaginal delivery other than a grade 2 tear which was repaired. She returned to the same ED three days after discharge with fever, tachycardia, respiratory distress, abdominal pain, diarrhea, and purpuric skin lesions. She was immediately admitted to MICU for impending septic shock and concerns for DIC. Initial labs at the outside hospital were notable for platelet count of 10,000, lactate of 9mmol/L, serum creatinine of 2.0mg/dL (baseline creatinine 0.5mg/dL). She began receiving treatment for HELLP syndrome and was started

on IVIG in addition to broad-spectrum antibiotics and IV fluid resuscitation. She was intubated for increased work of breathing and worsening metabolic acidosis. Initial blood cultures done at the outside hospital were positive for Group A *Streptococcus* (GAS).

She was transferred the next day to our quaternary care center for further treatment of DIC, septic shock, renal failure and concerns for toxic shock syndrome. She was promptly initiated on continuous renal replacement therapy (CRRT) upon arrival due to high doses of norepinephrine and vasopressin and worsening anuric renal failure. She was taken emergently to the OR for a total abdominal hysterectomy with bilateral salpingectomy for source control and then transferred to the Surgical ICU. No retained products of conception were found. On POD#1, ICU Day 2, her vasopressor requirements continued to increase, and intravenous epinephrine was added. She also received methylene blue and hydroxocobalamin as salvage therapy. Venous-arterial extracorporeal membrane oxygenation (ECMO) evaluation was requested due to concerns for possible cardiogenic shock, however, her shock state was determined to be purely septic and V-A ECMO was not initiated.

Currently, FDA Emergency Use Authorization (EUA) for the Seraph Filter is only applicable to patients with COVID-19. However, on ICU Day 3, emergent use for the Seraph Filter was granted for our patient and was added to her CRRT circuit. No anticoagulation was used during CRRT due to ongoing DIC, and 8 filters had to be exchanged due to clotting within the CRRT circuit. By ICU day 4, she was able to be weaned off all vasopressors. Her blood counts continued to improve, and she was extubated on ICU day 7. She was eventually transitioned off CRRT to intermittent hemodialysis (IHD). Her total ICU length of stay was 29 days, but this was due to various other complications unrelated to her initial shock state which rapidly resolved after Seraph Filter was initiated.

Discussion:

Our patient is the first case of septic shock from GAS that was successfully treated with the Seraph Filter. She required a total of 8 Seraph Filters during her CRRT run. This was due to circuit clotting, which was due in part to avoidance of heparin due to ongoing pancytopenia from DIC and slow flow rates due to her poor hemodynamics.



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The filter clotting issues were resolved after adjusting her vasopressor dosages and increasing the CRRT flow rates. Our patient had no allergies to any component of the Seraph Filter and did not face any adverse events after the filter was implemented.

The Seraph Filter does not affect the plasma concentration of certain antibiotics, which is crucial in a critical care setting as doses need to be closely monitored and reviewed frequently [3], [4]. Early intervention with the Seraph Filter in patients with bacteremia may result in clearing bloodstream infections [4]. A four-hour dialysis session with a 40% reduction in pathogen removal can result in a > 99% pathogen elimination [5]. One case report about an adolescent who was a deceased donor kidney transplant recipient suffering from disseminated adenoviral disease was able to show that the Seraph Filter was able to expedite the recovery process [7]. Pathogens and pro-inflammatory molecules play a significant role in sepsis-induced immune dysregulation, mitochondrial damage, and coagulation disorders leading to organ failure. The mechanism by which the Seraph Filter works is using heparin to bind these pathogens and inflammatory molecules through a process called hemadsorption. This allows for the safe and effective removal of pathogens, whether used alone or attached to a circuit (hemodialysis). Clinical outcomes can be improved by decreasing the concentration of these pathogens and pro-inflammatory molecules [6].

To our knowledge, no current studies or case reports discuss the use of the Seraph Filter specifically with GAS bacteremia in humans. Further studies with larger sample sizes would be able to properly quantify the true benefit of the Seraph Filter in ICU patients across different demographics.

Conclusion:

This patient recovered from GAS septic shock using the Seraph 100 filter. There were no adverse reactions when using the filter. This case provides an example of how the Seraph 100 filter can be used in the future to improve patient outcomes in an ICU setting in clinical conditions other than COVID-19. 🏠

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2024 ASA House of Delegates Recap

Thank you for the opportunity to serve SOCCA as the alternate delegate to the ASA. This year's meeting returned to Philadelphia for the first time since the 1960s and the City of Brotherly Love proved to be a great host city. The meeting was vibrant and energetic with over 12,700 people attending in person (including 1,200 international attendees) and an additional 500 virtual participants.

The House of Delegates (HOD) and reference committee meetings were equally high-spirited and full of rich discussion. Much of the discussion was focused in 2 areas: an intense competition for ASA first vice president and a proposal to reduce the length of the governance portion of the annual meeting to 4 days. Further details can be found below.

- Dr Donald Arnold, MD, FACHE, FASA ascended to the role of President.
- Dr Jeffrey Mueller, MD, FASA from Mayo Clinic in Scottsdale, was elected as first vice president. He brought forward a compelling platform that included professional unity and advocacy. His opponents, Dr Jay Mesrobian and Dr Michael Lewis ran competitive races and displayed a strong commitment to their respective causes.
- The HOD voted to approve a change to the annual meeting which would result in consolidating the HOD to a single session on Tuesday. This would end the educational and governance component of the meeting on the same day. Implementation would not occur before the 2026 Annual Meeting. The impact to SOCCA is difficult to anticipate, however, there may be an increased number of conflicts in scheduling governance, educational and committee activities.
- Call to action in support of the ASAPAC as donations are at a 10 year low with <9% of anesthesiologists contributing.
- The HOD approved multiple important and impactful statements. Most of these statements do not directly impact the specialty of critical care but may have

implications for other areas of your practice, a sample of these statements are listed below. For full details, please reference the ASA website.

- » Standards on Post anesthesia Care
- » Practice Advisory for Perioperative Care for Older Adults Scheduled for Inpatient surgery.
- » Continuum for Depth of Sedation
- » Drug Concentration Standardization
- » Economic Credentialing
- » Definition of "Immediately Available"
- » Harassment and Incivility
- » Fundamentals of Safe Workplace
- » Head Injuries in Anesthetizing Locations
- » Respiratory Monitoring during endoscopic procedures
- » Safe use of propofol
- » Statements on obstetric anesthesia – breastfeeding after anesthesia, pain during cesarean delivery, psychologic support, postpartum sterilization, and in vitro fertilization.
- SafeHaven is a wellness initiative that offers support for physicians who may be experiencing symptoms of burnout, stress or experiencing personal or professional struggles. Services include counseling, peer coaching, leadership development, legal resources, and work life concierge. Financial support was approved to supplement a discounted rate for the first 500 members who sign up for the program. More information regarding the program is available at <https://www.asahq.org/advocating-for-you/safehaven>. 🏠



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