

INTERCHANGE

President's Column:

SOCCA and Strategic Partnership With IARS



Brenda G. Fahy, M.D., F.C.C.M.

We have an exciting program planned for you at the upcoming SOCCA meeting. The SOCCA 26th Annual Meeting and Critical Care Update at the American Society of Anesthesiologists annual meeting in San Francisco last October was a great success. The educational program provided a depth of topics, and many residents were attracted to the mentoring program. As discussed at the business meeting, SOCCA is proceeding with a strategic alliance with the International Anesthesia Research Society (IARS), which will officially begin on January 1, 2014. The annual meeting of SOCCA will, for the next two years, occur immediately preceding the IARS Annual Meeting. For 2014, the all-day SOCCA Annual Meeting and Critical Care Update will take place on May 16 in Montréal.

The overall structure of the 27th Annual Meeting and Critical Care Update will remain as one entire day of educational opportunities presented with the highest quality, as has been its tradition. The submission of competitive abstracts with high-caliber presentations will remain a key feature of the SOCCA meeting. Please watch for updates in future newsletters and begin preparing your abstracts, as there will be earlier submission dates this year for these scholarly presentations because of the May meeting time. The SOCCA ultrasound workshop will now be offered as a several-

One of the reasons SOCCA chose to partner with IARS is because the strategic vision of SOCCA is supported by IARS. This includes the plan for SOCCA to increase its membership, especially with those who are interested in future careers in critical care anesthesiology. We at SOCCA would like to include medical students, residents, and critical care fellows as members, with their ability to learn from the educational opportunities and mentorship from other SOCCA members. SOCCA is developing an updated "Residents' Guide," with a projected release in 2014.

Please join us in Montréal, Canada for the
27TH SOCCA Annual Meeting and Critical Care Update
 on Friday, May 16, 2014.

hour workshop during the IARS meeting. For the convenience of SOCCA attendees, this is planned to occur the day after the SOCCA meeting. Other workshop opportunities SOCCA will offer include an anesthesia-oriented ACLS course. SOCCA membership has had input into the IARS program for Montréal and will participate in other educational offerings, including lectures, panels and Problem-Based Learning Discussions. Please join the SOCCA and IARS activities in Montréal this coming May. The final program will be posted soon, so watch for it on the IARS website www.iars.org/home/default.asp or as advertised in *Anesthesia & Analgesia*.

SOCCA looks forward to this partnership with IARS and we are excited at the wonderful opportunities and the potential international collaboration that the International Anesthesia Research Society will afford SOCCA. Please join us in Montréal – first for the SOCCA 27th Annual Meeting and Critical Care Update, and then stay for the IARS Annual Meeting.

Hope to see you there, or as they say in Montréal, "Au plaisir de vous y voir!"

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MEMBERSHIP INFORMATION

E-mail

You may e-mail inquiries to SOCCA at:

General inquiries:

SOCCA@asahq.org

Meeting information:

SOCCAm meetings@asahq.org

Membership information:

SOCCAmembership@asahq.org

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Membership in SOCCA is open to all anesthesiologists and residents in approved anesthesiology programs. Membership applications may be obtained by contacting SOCCA at (847) 825-5586 or through the SOCCA website at **www.SOCCA.org/membership.php**.

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Remember, payment of your dues allows you to enjoy the full privileges of SOCCA membership.

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EDITORIAL NOTES

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Editor

Liza Weavind, M.D.
Associate Professor
Director, Critical Care Fellowship
Department of Anesthesiology
Vanderbilt University Medical Center
Nashville, TN
liza.weavind@vanderbilt.edu

Associate Editor

Jordan E. Brand, M.D.
San Francisco VA Medical Center
University of California
Berkeley, CA
jbrandmd@gmail.com

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Michael Woo, M.D.

A Note from the Editor to SOCCA Members:

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 Chris Dionne at **c.dionne@asahq.org**.

The SOCCA Interchange is published by the Society of Critical Care Anesthesiologists, 520 N. Northwest Highway, Park Ridge, IL 60068-2573; (847) 825-5586.

SOCCA 26th Annual Meeting Recap



Ronald Pauldine, M.D.
 Clinical Professor
 Department of Anesthesiology
 and Pain Medicine
 University of Washington
 Seattle, WA



Carlee A. Clark, M.D.
 Assistant Professor
 Anesthesia and Perioperative Medicine
 Medical University of South Carolina
 Charleston, SC



Patricia Murphy, M.D.
 Associate Professor
 University of Toronto
 Toronto, ON, Canada

The 26th SOCCA Annual Meeting and Critical Care Update was held on October 11, 2013 at the Hyatt Regency Embarcadero Center in San Francisco. The meeting was attended by 240 members, critical care fellows and residents in anesthesiology. A total of 39 posters, including abstracts of original research and challenging clinical cases, were presented.

The program presented updates and discussion in diverse areas of interest to the practicing anesthesiologist/intensivist, including clinical management, practice opportunities and basic and translational research. The first morning session, "Plus Ça Change, Plus C'est La Meme Chose: Everything Old Is New Again," featured presentations on recurring debates within the critical care community. Brian Kavanagh, M.D. delivered an informative and entertaining discussion on the fallacy of ventilator-associated events (VAE) as a measurement of quality of care in intensive care units. The critique included

commentary on the overstatement of incidence and clinical importance of VAE, the lack of agreement on diagnostic criteria, that these criteria are more appropriately screening criteria rather than diagnostic, and questioned the efficacy of particular VAE prevention bundle elements. Eddy Fan, M.D., Ph.D., from Toronto, presented an overview of the use of extracorporeal membrane oxygenation (ECMO) for management of respiratory failure. Dr. Fan provided an outstanding review of the historical evolution of ECMO in respiratory failure, discussed the technological advancements that have eased implementation and reviewed recent clinical evidence in the area. The session concluded with SOCCA President-Elect Aryeh Shander, M.D., FCCM, discussing the longstanding debate and controversy concerning the best fluids for resuscitating the critically ill. Dr. Shander noted wide variation in practice patterns, reviewed the currently available data on crystalloids and colloids,

discussed the roles of colloid oncotic pressure and viscosity, and postulated reasons for the apparent discrepancy between the published literature and some guidelines for the use of human albumin.

The second afternoon session, "Off the Beaten Path: From Translational Concepts to Important Publications," focused on novel concepts, the translational evolution of ideas from the bench to bedside, and clinically relevant work published in sources less familiar to anesthesiologist/intensivists. John Lang, M.D., from the University of Washington, presented an overview of his work on modulating ischemic reperfusion injury and the potential therapeutic role of inhaled nitric oxide in improving outcomes in liver transplantation. Sadeq Quraishi, M.D., M.H.A., then presented his work on the implications of vitamin D deficiency in acute illness.

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SOCCA 26th Annual Meeting Recap

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Dr. Quraishi noted that the affects of vitamin D in chronic conditions are well understood but little work has been done to understand what role, if any, vitamin D may play in acute illness. Data were presented suggesting a possible role for vitamin D in modulating immune responses and downstream implications for infection risk. The session concluded with a panel led by Miguel Cobas, M.D., from the University of Miami, presenting brief reviews of more obscure publications of interest. The panel consisted of Daniel Emmert, M.D., Ph.D., from Washington University in St. Louis, discussing novel applications of ECMO, Daryl J. Kor, M.D., from Mayo Clinic, reviewing transfusion and coagulation and Mark Nunnally, M.D., FCCM, discussing selected topics in infectious disease. The morning concluded with the introduction of incoming American Society of Anesthesiologists (ASA) President Jane C.K. Fitch, M.D. by SOCCA President Brenda Fahy, M.D., FCCM. Dr. Fitch delivered the annual ASA update with an outline of ASA programs, goals and challenges for the coming year.

The lunch break featured another successful year of the popular SOCCA mentorship program led by Dr. Mark Nunnally. The program pairs residents with an interest in critical care fellowship training with active SOCCA member mentor volunteers for advice, collegiality and networking. Lunch concluded with the presentation of the Young Investigator Award by Patricia Murphy, M.D., to Ryan M.J. Ivie, M.D., from Columbia University. Dr. Ivie presented his abstract, "The Generalizability of Randomized Controlled Trials in Critical Care Medicine." The information presented stressed the point that research methodology often limits inclusion in clinical trials, including highly influential trials that inform much of contemporary practice, to patients that may differ from those we actually treat.

The afternoon session began with an interactive panel on the practice opportunities for anesthesiology-trained intensivists outside of traditional academic practice. The expert panel was moderated by Eugene Cheng, M.D., from Kaiser Permanente in San Jose, California. His panel included members practicing in different geographic areas, different practice models and individuals with extensive past experience in both academic and non-academic environments. Panelists included Christopher Barth, M.D., Jordan Brand, M.D., and Steve Deem, M.D.

Research was the focus of the following sessions, including a presentation by Erik Kistler, M.D., Ph.D., and moderated poster discussions. Dr. Kistler, a past recipient of the SOCCA/Foundation for Anesthesia Education

The Lifetime Achievement Award was presented by Aryeh Shander, M.D. to Charles Durbin, Jr., M.D. Dr. Durbin's acceptance speech, "Four Things I Thought I Knew..." offered a unique perspective on changing practice over time with a focus on areas that have been ongoing sources of controversy, including resuscitation, the use of positive-end expiratory pressure for management of adult respiratory distress syndrome, steroids for the management of sepsis, and organizational aspects of critical care delivery systems.

The critical care update concluded with a session on controversies in neurological care in the intensive care unit. Andrea Gabrielli, M.D., from the University of Florida, presented an overview and discussion of controversies

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and Research/Hospira Physician Scientist Award, presented an update on his area of research with a presentation titled "The Role of Digestive Enzymes in Circulatory Shock." Dr. Kistler's work focuses on the role of pancreatic enzymes in animal models of circulatory shock and the intriguing possibility that inactivation of these enzymes in the intestinal lumen may provide therapeutic benefit. A lively moderated poster session followed. The SOCCA Annual Meeting Planning Committee is extremely grateful to the overwhelming number of SOCCA members who volunteered to review abstracts and serve as poster moderators. It is the support and involvement of our membership that maintains the enthusiasm, volume and exceptional quality of the work presented.

in care for patients following cardiac arrest. Dr. Gabrielli stressed that the pathophysiology following return of spontaneous circulation in the patient following cardiac arrest is a syndrome affecting multiple organs. Potential areas of active treatment in selected patients include therapeutic hypothermia, percutaneous coronary intervention, and goal-directed therapy. Current data, recommendations and ongoing controversies in these areas, as well as evolving techniques and challenges for prognosticating neurologic outcome, were reviewed. The final presentation of the day was a comprehensive review of the use of multimodality monitoring in the neurological

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SOCCA 26th Annual Meeting Recap

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intensive care unit by Lori Shutter, M.D., from the University of Pittsburgh. Dr. Shutter discussed the technology, clinical applications and limitations of an array of devices and techniques, including continuous electroencephalography, electrocorticography, jugular venous saturation, near infrared spectroscopy, brain tissue oxygenation, cerebral microdialysis and new

techniques for measuring regional cerebral blood flow and assessing cerebral autoregulation.

The day wrapped up with the SOCCA business meeting and a special session for residents and fellows followed by a wine and cheese reception. Future SOCCA meetings will be held in conjunction with the International Anesthesia Research Society's (IARS') Annual

Meeting. IARS typically meets in the spring of each year so our next meeting will be coming up very soon. We will be meeting again for the 27th SOCCA Annual Meeting and Critical Care Update in Montréal, Canada, on Friday, May 16, 2014. Please save the date. We hope to see you there for another exciting and informative program.



27th SOCCA Annual Meeting and Critical Care Update

Friday, May 16, 2014

Fairmont The Queen Elizabeth Hotel

Montréal, Canada

PRO: Utilization of Invasive Arterial Blood Pressure Monitoring in the Critically Ill



Jessica Hobbs, M.D.
CA-3 Resident, Chief Resident
University of Maryland School of Medicine

Cardiovascular monitoring is essential to the care of the critically ill, particularly with assessing severity of illness and assisting in decision-making. Since the 1700s, the standard for arterial pressure monitoring in the ICU is direct arterial catheterization measurement, often through the radial artery.^{1,2} Despite being the current standard of care, direct cannulation of the artery can be difficult and is associated with risks, including osler node formation, partial or complete occlusion, pseudoaneurysm formation, thrombosis at the site of catheterization, and sepsis.³ Secondary to these risks, non-invasive arterial pressure monitors have gained popularity in an attempt to accurately monitor arterial pressure. Experience has demonstrated that these devices are reliable in healthy volunteers, but can this technology be used in critically ill patients in the ICU?

One method of non-invasive blood pressure monitoring being used is the oscillometric

blood pressure cuff. This method is easy, fast, requires minimal training, and poses very few risks to the patient. But can this be used in the ICU, where inaccurate measurements can determine the difference between medically unnecessary treatments, transfusions and even death? A study by Bur et al. compared oscillometric blood pressure readings to invasive arterial line readings in ICU patients and found the mean arterial pressure was significantly different between both readings.³ In general, the non-invasive blood pressure readings significantly underestimated intra-arterial blood pressure measurements. Furthermore, as the U.S. proportion of morbidly obese people steadily increases, with as many as 14 cases per 1,000 ICU admissions each year being morbidly obese, there are concerns about accuracy of non-invasive cuff blood pressure measurements due to incorrect cuff sizing and lack of standardization. Araghi et al. demonstrated that oscillometric blood pressure cuffs significantly underestimated blood pressure readings in all patients, including patients with a BMI > 30.⁴ Lastly, there have been very few studies done to determine the accuracy of blood pressure cuff measurements in the setting of patients on inotropic support. Until further studies are done in this setting, the non-invasive cuff blood pressure measurements may be of questionable reliability in the critically ill patient.

Another method on the forefront of non-invasive monitoring is the non-invasive arterial blood pressure and cardiac output monitor devices. One of the most recent of these is the Nexfin HD (BMEYE B.V., Amsterdam, Netherlands), which is based on the development of the pulsatile unloading of the finger arterial walls using an inflatable finger cuff.⁵ It has been shown to be accurate in healthy volunteers.^{6,7} Schatternkerk et al. showed a good correlation between Nexfin and blood pressure measurement by the

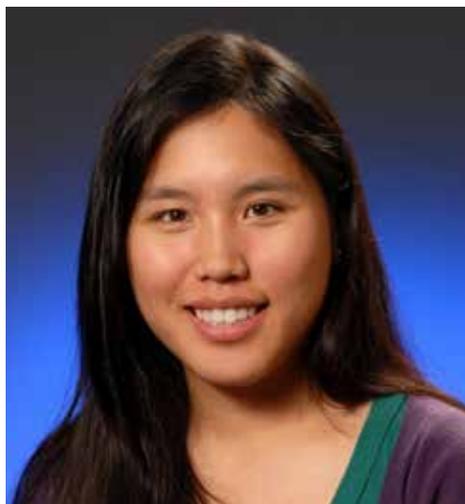
Riva-Rocchi/Korotkoff technique.⁸ However, this study compared two non-invasive methods in healthy patients. The validity and applicability in critically ill patients of such non-invasive monitoring is unknown. Furthermore, Stover et al. demonstrated that Nexfin monitoring should not be substituted for direct arterial blood pressure measurement, as the difference in MAP between the two methods was 2 ± 8 mmHg.⁵ In a critically ill patient, this could mean the difference between aggressive treatment versus close monitoring.

While the use of a non-invasive method for blood pressure monitoring in the ICU may seem appealing, particularly in those patients who arterial cannulation is difficult, the applicability in the ICU has not been validated. Further studies must be done, as we continue to utilize the standard of care for blood pressure monitoring in the critically ill: direct arterial catheterization.

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CON: Utilization of Invasive Arterial Blood Pressure Monitoring in the Critically Ill



Lindy Watanaskul, M.D.
CA-2 Anesthesiology Resident
University of Maryland Medical School

Many of us have debated about the need for invasive arterial monitoring in patients. Despite having clear indications for invasive blood pressure monitoring insertion, there are a significant number of patients who receive unnecessary invasive procedures that can lead to more harm than good. Although most peripheral cannulations are performed safely, there are still risks and complications. Scheer et al. discussed the risks of peripheral arterial cannulation for invasive blood pressure monitoring, including temporary occlusion, pseudoaneurysms, sepsis/infection, ischemia, abscess and hematoma formation.¹ In the perioperative period, arterial cannulation can also add time in the operating room (O.R.), dependent on provider experience and expertise. The cost of O.R. time per minute can range anywhere from \$22 to \$133 per minute, and added time for invasive arterial cannulation can prove costly.² Invasive monitoring can also lead to false readings from errors and artifacts

such as damping of the arterial wave or changes in transducer height. There are also patients with particular injury patterns or predisposing medical conditions, making arterial cannulation difficult or impossible, including some critically ill patients, trauma, peripheral vascular disease and the pediatric populations.³ Additionally, improvements in non-invasive blood pressure monitoring technology, such as the Nexfin (BMEYE, Amsterdam, The Netherlands), T-Line TL-200 (Tensys Medical), Intellivue MP50 (Philips), may allow wider application of these systems in the perioperative and intensive care units (ICUs).

Arterial tonometers utilize a specific piezoresistive transducer and a micro-processor-based electronic system to continuously monitor blood pressure waveforms. Martina et al. showed safe and reliable blood pressure monitoring with arterial tonometers in anesthetized patients compared with concurrent invasive arterial blood monitoring in age groups ranging from 8-82 years old.⁴ Pulse contour monitors, such as the Nexfin, have also been shown to be effective. It utilizes an inflatable cuff positioned on a finger and measures continuous BP (systolic, diastolic, mean) and heart rate and calculates continuous

Technological innovations, such as arterial tonometers and pulse contour monitors, are becoming increasingly utilized and have shown that they are both accurate and efficacious.

Current modes of blood pressure monitoring most useful in the critical care and perioperative setting include intermittent upper-arm sphygmomanometers, electronic oscillometric monitors, arterial tonometry and pulse contour monitors. Electronic oscillometric monitors are accurate, inexpensive, require little experience and are the main method of blood pressure monitoring. However, this method has limitations, including inaccuracy in obese patients, questionable validity in critically ill patients with hemodynamic instability, and inability to visualize waveforms and monitor beat-to-beat blood pressure variations. Technological innovations, such as arterial tonometers and pulse contour monitors, are becoming increasingly utilized and have shown that they are both accurate and efficacious.

cardiac output (CCO), stroke volume (SV) and systemic vascular resistance (SVR).⁵ The ease of use of this technological advancement allows many health providers to quickly obtain valuable hemodynamic information. The utility in the critical care setting is promising. Martina et al. evaluated 50 patients undergoing cardiothoracic surgery and compared non-invasive arterial blood pressure monitoring with invasive arterial blood pressure monitoring during a 30-minute period. Results showed that values were comparable to each other with correlation coefficients for systolic, diastolic and mean pressures 0.96 (0.91-0.98), 0.93 (0.87-0.96), 0.96 (0.90-0.97), respectively.⁶ Fischer et al. studies a similar number of patients postoperatively following cardiac surgery,

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Barrier Precaution Recommendations for Arterial Line Placement



Brian Wessman, M.D.
Co-Director, Critical Care Fellowship
Assistant Professor of Anesthesiology and
Emergency Medicine
Washington University School of Medicine
Saint Louis, MO

Jessica Smith, M.D.
Assistant Professor
Washington University
School of Medicine
Saint Louis, MO

Alex Kim, M.D.
Assistant Professor
University of New Mexico
Health Sciences Center
Albuquerque, NM

Patient Case Vignette:

A 71-year-old male with a past medical history for HTN, DM and PVDz is admitted to the intensive care unit in septic shock requiring vasopressors and mechanical ventilation. He is POD #8 from a lower extremity revascularization procedure and his presumed source is pneumonia. As you are actively titrating vasopressors with his resuscitation, a decision is made to place invasive arterial access for monitoring. After failing to obtain radial arterial access, you decide to access an axillary arterial site under ultrasound guidance. As you prepare for the procedure, the nurse asks if you will need a full barrier drape and full body gown/cap for sterility, similar to best care practice policy for central venous cannulation.

Secondary to multiple professional opinions regarding appropriate barrier techniques for arterial line insertion, we were asked to provide a formal recommendation regarding this topic. Our goal was to review the most recent literature, summarize and provide a formal recommendation.

Literature Reviewed:

- 1) Pronovost P, et al. An intervention to decrease catheter-related bloodstream infectious in the ICU. *New England Journal of Medicine*. 2006; 355:2725-32.
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Literature Summarized:

1) This NEJM article, often referred to as the Keystone Initiative, looks at the institution of CDC recommendations for the reduction of catheter-related bloodstream infections in more than 100 Michigan ICUs. The five evidence-based procedures instituted were: hand-washing, using full barrier precautions during the insertion of central venous catheters, cleaning the skin with chlorohexadine, avoiding the femoral site if possible, and removing unnecessary catheters. They report the ability to institute this protocol and a sustained reduction (up to 66 percent) of bloodstream infections from central venous catheters throughout the 18-month study period.

after the fifth day. This group calls into question the practice of scheduled “wire-over” changes of central venous catheters and arterial lines secondary to these findings. Of note, the protocol used in this study was full barrier drapes for insertion of arterial catheters at the radial site.

3) This was a randomized trial (from Belgium) to investigate whether the use of maximal barrier precautions, similar to those used in placing a central venous catheter, decreased the rate on infection when placing arterial lines (sites: radial and dorsal pedis). The control group was the use of hand-washing, sterile gloves, and skin disinfection with chlorohexidine and alcohol. They found no difference between

arterial lines as compared to 4.98 episodes per 1,000 catheter days for CVP. All their arterial lines were placed with sterile gloves, gown, mask, cap and sterile drapes around the insertion site. The results obtained showed that what was associated with increased risk for a BSI were length of ICU stay and days of insertion. They also showed only a trend toward higher infection risk in femoral sites compared to radial, although when there was an infection in the femoral site, it was often associated with gram negative bacteria.

5) This was a prospective observational study (in Sweden) to determine incidence and risk factors for arterial catheter colonization and arterial colonization catheter-related infections in a single ICU. In this study, 600 arterial catheters were placed using sterile gloves and chlorhexidine, and they found no cases of arterial catheter-related blood stream infections. There were 20 (3.3 percent) cases of arterial catheters with a positive tip culture, but again, none of these were deemed to cause a blood stream infection (defined as SIRS criteria and positive tip culture). This group advocates that full protective barrier (mask, cap and gown) would not decrease the incidence of arterial-related blood stream infections. Risk factors for arterial catheter tip colonization appears to be a coexisting infected central venous catheter.

Central venous catheters and arterial lines appear to share similar risk factors for bacterial colonization, which is different than what was previously believed. These risk factors appear to be associated with length of time of line insertion, non-sterile access/manipulation of the line, and number of ICU days.

2) The objective of this observational study (done in France) was to compare the daily risk factors for invasive catheter colonization and risk factors for catheter-related bloodstream infections from both arterial lines and central venous catheters. The group reports that the risk of line colonization did not differ significantly between central venous catheters and arterial lines. They also report an interesting finding of the risk of colonization increasing in a linear fashion over time for arterial lines; while the risk of colonization of central venous catheters appears to plateau

the incidences of colonization between the two groups. There was also no difference in infection rates between the two groups. Of note, the authors do comment on the use of cumbersome guide-wires (Seldinger technique) and their risk of increasing infection.

4) This study was a retrospective, non-randomized trial (in Spain) to analyze the incidence of arterial catheter-related BSI in radial and femoral sites. What they found was 3.53 episodes per 1,000 catheter days for

Summary Discussion:

Published data exist to support the need for full barrier precautions for the insertion of central venous catheters. This same data do not exist for arterial line insertion. Central venous catheters and arterial lines appear to share similar risk factors for bacterial colonization, which is different than what was previously believed.

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Barrier Precaution Recommendations for Arterial Line Placement

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These risk factors appear to be associated with length of time of line insertion, non-sterile access/manipulation of the line, and number of ICU days. There may be correlation between coexisting contaminated vascular lines and greater infectious rates. Arterial lines placed at peripheral sites (radial and dorsal pedis) can be placed using local barriers and sterile technique. Concern does exist in the literature of possible contamination complications from arterial lines placed using the Seldinger technique and long guide-wires. Therefore, these same techniques may not work for centrally placed arterial line sites (femoral, axillary). Due to line colonization risks, accessing/manipulation of lines should be recognized as increasing bloodstream infectious risk, and “clean techniques” should always be observed. Secondary to these risks, rewiring of all lines (central venous and arterial) greater than 48 hours old may increase the risk of a bloodstream infection.

Recommendations:

- 1) **{data}** Peripheral arterial line insertion sites (radial and dorsal pedis): isolate the extremity, wide local barrier drapes (sterile towels) with sterile techniques (gloves, chlorhexidine); full barrier set-up is not required.
- 2) **{extrapolated}** Prolonged attempts using a non-protected Seldinger technique (30 min)/multiple providers (>3) at a peripheral arterial line insertion site: strongly consider changing to a full barrier set-up (caps, gown and bed drape) or re-draping the insertion site.
- 3) **{extrapolated}** Femoral and axillary arterial line insertion sites may benefit from full barrier set-up or recognition of guide-wire awareness.
- 4) **{data}** Physicians/nurses accessing all invasive lines should be instructed to ALWAYS use “clean techniques” (gloves, alcohol swab to port hub, etc.) secondary to known line colonization risks.
- 5) **{extrapolated}** Rewiring arterial lines that are greater than 48 hours old may increase the risk of a bloodstream infection (due to line colonization) and this should be weighed as the procedure is discussed

Returning to Our Patient Case Vignette:

Since you have transitioned from a “peripheral arterial site” to a “central arterial site,” the axillary artery in this case, you decide to take a few extra minutes to provide maximal sterility for your patient in septic shock. You observe full-body sterility techniques by using a gown, cap and bed drape. The results obtained indicated the increased risk of BSI was associated with ICU LOS and number of days since insertion. The procedure is completed without complication. (0.87-0.96), 0.96 (0.90-0.97), respectively.⁶ Fischer et al. studies a similar number of patients postoperatively following cardiac surgery.

Emergency Medicine ACCM Training



*Brian Wessman, M.D.
Co-Director, Critical Care Fellowship
Assistant Professor of Anesthesiology and
Emergency Medicine
Washington University School of Medicine,
Saint Louis, MO*

clinical exposure but requires specific surgical critical care time (both during the first year and by completion of the training cycle).

Emergency medicine trainees have been pursuing critical care medicine fellowships through various venues since the late 1970s, but no formal pathway to U.S. certification existed.² Many EM/CCM trainees resorted to obtaining formal certification from the European Society of Intensive Care Medicine. Currently, there are more than 200 EM/CCM fellowship trained physicians practicing in various models in the U.S.

exposure as an advanced preliminary resident to surgical rotations (as determined by the surgery residency director and the SCC fellowship program director). The second year is completion of the standard SCC training curriculum.

The ABA/ABEM cosponsored pathway is unique in its approach to be all-inclusive and to create the potential flexible framework for a well-rounded multidisciplinary clinical-based training curriculum for the EM/CCM fellow.¹ The EM applicant has the prerequisite of needing to complete four months (16

Graduates of EM residency programs are unique in their training and background, making them ideal candidates for critical care medicine training.

Starting with academic year 2014, a co-sponsored pathway to critical care medicine certification from the American Board of Anesthesiology (ABA) and the American Board of Emergency Medicine (ABEM) will take effect for potential fellowship trainees with a primary residency in emergency medicine.¹ Earlier this year, the American Board of Medical Specialties formally approved this new training pathway as well as a limited grandfathering pathway (expiring 2018). The new pathway requires that the emergency medicine/critical care medicine (EM/CCM) candidate complete two years of critical care fellowship training at an ACGME-approved anesthesiology critical care medicine (ACCM) program. These ACCM programs must apply with the ABA and be approved for a two-year EM/CCM training track. The fellowship curriculum allows latitude for multidisciplinary

The American Board of Internal Medicine (ABIM) and ABEM announced a co-sponsored pathway to formal U.S. CCM certification with the first exam being offered in 2011.³ Twenty-five diplomates took this initial certifying exam with all of them successfully obtaining certification.⁴ Specifics of the ABIM/ABEM CCM pathway include a 24-month curriculum and a prerequisite of completing six months of internal medicine exposure (three months in a MICU setting) prior to/or in conjunction with the start of the fellowship training.³ The American Board of Surgery (ABS) subsequently announced its own unilateral (not cosponsored by ABEM) EM surgical critical care (SCC) training pathway.⁵ Specifics of the ABS pathway include completion of 24 months of training, with the first year requiring primary

weeks) of ICU rotations during residency as well as successfully completing an ACGME EM residency. The pathway requires that all EM/CCM fellows complete 24 months of training in an approved ACCM curriculum. This is required of EM applicants, regardless of whether they have completed a three-year (36-month) or four-year (48-month) residency program. The two-year curriculum requires that both years of training be completed at the same ACCM site. During the first six-months of fellowship training, the EM/CCM fellow should have exposure to at least three surgical-based rotations, and by completion of the 24-month cycle, the EM/CCM fellow should have completed a total of 12 months of surgical exposure. However, latitude does exist in how

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Emergency Medicine ACCM Training

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to define “surgical exposure.” For example, this requirement could be met in a “mixed” medical/surgical ICU or rotations such as “nephrology” and “infectious disease” as long as sufficient exposure to surgical patients was gained. The requirements also encourage multidisciplinary critical care exposure to rotations such as pulmonary medicine, bronchoscopy, cardiology, etc., as well as anesthesiology rotations (pre-op or perioperative rotations). This pathway is a clinical-based curriculum and requirements do stress that no more than two elective rotations (two months) can be spent pursuing research.

ACCM programs must apply for formal EM/CCM two-year curriculum approval through the ABA.¹ This application is a simple document that requires information regarding existing ACGME training programs (CCM, SCC, anesthesiology), proposed EM/CCM curriculum and how the surgical exposure requirements are met, and select signatures from institutional leadership (including the anesthesiology chair). Currently, there are only two national ACCM programs that have received formal ABA EM/CCM curriculum approval: Washington University School of Medicine in St. Louis, and Case Western Reserve University. The hope would be to have continued growth with more ACCM-established programs seeking EM/CCM formal training approval.

Graduates of EM residency programs are unique in their training and background, making them ideal candidates for critical care medicine training. During residency, they are required to have exposure to the undifferentiated critical care patient and part of their specialty training is stabilization of this patient population prior to arrival in the ICU setting.⁶ They become adept at multitasking and providing critical care for emergent cardiac failure (STEMI, heart failure, arrhythmias, cardiopulmonary failure, etc.), acute neurologic events (stroke, status epilepticus, intracranial hemorrhage, etc.), respiratory failure

(hypoxia, COPD, asthma, PNA, etc.), sepsis, toxicology, blunt/penetrating trauma patient, GI hemorrhage, wound care, burn injuries, metabolic derangements, etc.⁶ Procedural acumen with emergent airway stabilization, vascular/arterial access, thoracostomy, para/thora/cardio-centesis, and point-of-care ultrasound imaging, among other procedures, is expected of the EM graduate.⁶ The annual interest by EM residency graduates in the specialty of critical care medicine continues to rise creating a nice addition to the existing pool of anesthesiology residency graduates interested in ACCM fellowship training. With a deeper pool of applicants, the specialty of anesthesiology CCM can continue to expand by cultivating and developing future intensivists leaders.

The EM/CCM training tract is a two-year curriculum. The first year of EM/CCM training, similar to any anesthesia ACCM fellow, does count against a program’s approved complement of fellows; however, the second year of training does not “count against” your total tally. This will provide ACCM training programs with the ability to expand the bandwidth of patient coverage models. Specifically, “senior” level fellows can help with patient care transitions at the start of the academic cycle and orient a new class of ACCM trainees. One obvious downside and growth limitation of this two-year training model is procuring funding for the second year. Potential funding could be requested of the hospital as critical care needs continue to expand and further revenue is generated from patient care. Alternatively, supplemental funding could be provided by departmental educational funds.

The ABA/ABEM co-sponsored agreement is a major development both for emergency medicine but also for anesthesiology CCM. The certification pathway was well structured to allow growth of multidisciplinary training curriculums as well as to foster continued

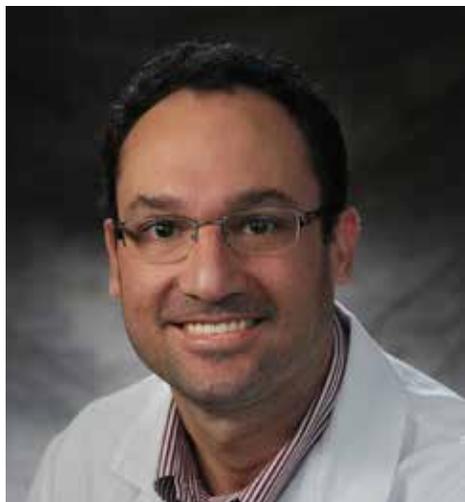
growth of our specialty. Due to its inclusive nature, EM/CCM trainees will be attracted to ACCM programs as long as we continue to grow the number of potential slots in approved training programs. This new influx of trainees will continue to strengthen our ranks and improve our visibility on the national scene.

Please feel free to contact the ACCM program at Washington University in Saint Louis School of Medicine, wessmanb@anest.wustl.edu. Future publications will look at specifics regarding our multidisciplinary curriculum and training program history.

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Fellowship Program Directors Breakfast Summary



*Benjamin A. Kohl, M.D., FCCM
Chief, Division of Critical Care
Program Director,
Adult Critical Care Medicine Fellowship
Medical Director,
Penn ELert Telemedicine Program
Department of Anesthesiology and Critical Care
Perelman School of Medicine,
University of Pennsylvania*

The majority of ACCM program directors (PDs) were able to meet this October in San Francisco to discuss pertinent issues of concern to all of us. We began our meeting promptly at 7 a.m. with an update by Dr. Rob Sladen on the status and direction of AASPD. As a group, we have begun collaborating with the ACTA members on many issues and have decided, for the first time, to meet as a group at this year's AASPD in Philadelphia. Both Dr. Doug Coursin and Dr. Neal Cohen were able to provide their valuable insights into issues surrounding ABA and RRC. In particular, while the ABA recently announced a novel pathway for EM residents to enter ACCM fellowships, many of the details are still vague and it will be up to the individual programs to create innovative paradigms. Several programs have already applied and received approval for a combined training program, and we were able to hear the plans that they had laid out.

ACCM fellowship programs will be engaging in our first match this year (for fellows starting July 2015). The match service we decided to use was SF Match, similar to our CTA colleagues. Important dates are the following:

- Registration opens November 1, 2013
- Rank list submission deadline May 22, 2014
- Match results available May 29, 2014
- Training begins July, 2015

The majority of programs have agreed to participate and we are all excited to incorporate this paradigm. I think we all believe it is in the best interest for programs and, more importantly, for applicants.

Our next meeting was scheduled for the AASPD on Friday, November 1. At that time, we will meet as a PD group and I have set aside time to meet with the ACTA PDs as a larger group to discuss issues of common interest (i.e., how to expand our dual ACCM/ACTA fellowship programs).

Finally, it has been an absolute honor to serve as the inaugural chair of the PD committee for the past several years. I feel that we have accomplished a great deal as a group and the future of our specialty looks genuinely bright. My successor will be Dr. Miko Enomoto, from the Oregon Health & Science University, who I know will do an outstanding job of leading our group. I look forward to seeing everyone soon, either at AASPD or SCCM.

Fellowship Review: The University of California, San Francisco (UCSF)



*Zeb McMillan, M.D.
Critical Care Fellow
University of San Francisco*

The Critical Care Fellowship Program at the University of California, San Francisco is an ACGME-accredited one-year program that provides a wide breadth of experience covering all aspects of critical care medicine. Fellows in the program rotate through two 16-bed combined medical-surgical ICUs, the 24-bed neurology/neurosurgical ICU, and the 16-bed cardiology/cardiothoracic ICU.

The multidisciplinary program includes fellows from anesthesiology, internal medicine, neurology, surgery and emergency medicine, all working interchangeably throughout the ICUs. The exposure to nearly every type of patient and disease process is enhanced by the experiences of the other specialty fellows within the program. The attending physician coverage also derives from multiple specialties, which helps to strengthen the teaching program and to provide fellows with exposure to broad-based approaches to the management of critically ill patients.

The fellowship year includes seven months of ICU at Moffitt/Long Hospital, a tertiary referral center. The patient population includes major surgical cases such as: heart, lung, liver and kidney transplantation, extra-corporeal life support, major orthopedic, general, and vascular surgery as well as medical cases, including hematologic malignancies, ARDS, renal failure and neurologic disorders. An additional two months are spent at San Francisco General Hospital, a level 1 trauma center. These rotations include exposure to the trauma ICU and an additional medical intensive care unit (MICU).

The fellowship program offers a diverse array of choices for the remaining three months of elective time. Popular electives include nephrology, infectious disease, cardiac echo/ultrasound, palliative care, research, nutrition, respiratory care or radiology. Special electives can be developed in nearly any area to suit the individual clinical or research interests of the fellow. The Critical Care Group at UCSF has multiple NIH-funded grants, in addition to a number of innovative foundation-funded programs.

Fellows are responsible for supervising and teaching residents and giving didactic seminars during morning lectures, grand rounds, and morbidity and mortality reviews. They also assist with patient triage and patient transfer. The didactic curriculum includes daily lectures for the first two weeks of the fellowship and then weekly conferences with the faculty on various ICU topics throughout the year. Fellows also attend a two-day focused critical care ultrasound course followed by weekly ultrasound journal clubs, where patient images are presented and reviewed. Twice a year there are patient simulations in a state-of-the-art simulation lab. Mock scenarios are presented and fellows can obtain immediate direct feedback on their performance.



San Francisco itself hosts hundreds (if not thousands) of interesting attractions. From tourist sites such as Chinatown and Alcatraz, to amazing hole-in-the-wall eateries and local breweries, San Francisco has something for everyone. Within a short drive, you can cruise along the beautiful coastal highway to go surfing, go to Napa for a wine tour, visit Lake Tahoe to go skiing or camping, or cross over the Golden Gate Bridge to visit and hike through Muir Woods.

Aside from enjoying the art and culture of this beautiful city, graduating fellows are prepared well for board certification and critical care practice in both academic and private settings. For more information regarding the program, please contact our Fellowship Program Director, Dr. Linda Liu LIUL@anesthesia.ucsf.edu, or our Program Coordinator at fellowships@anesthesia.ucsf.edu.

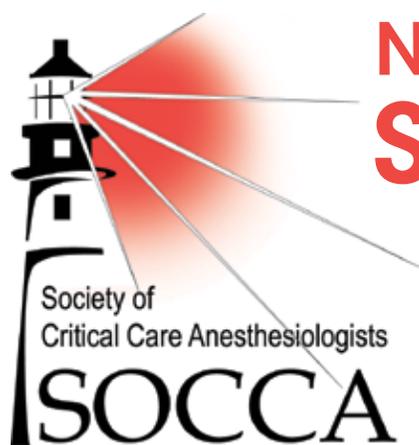
CON: Utilization of Invasive Arterial Blood Pressure Monitoring in the Critically Ill*Continued from page 7*

demonstrating safe, reliable and convenient monitoring utilizing pulse contour monitors with a significant statistical relationship for systolic, diastolic and mean pressures.⁷

Noninvasive arterial blood pressure monitoring, such as pulse contour monitors, would be useful in critically ill patients where arterial catheterization is difficult or prolonged catheters are no longer acceptable options and diligent hemodynamic monitoring is essential. They have demonstrated efficacy in the perioperative and ICU setting and should be considered effective, safe and reliable.

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