N E W S L E T T E R

Society of Critical Care Anesthesiologists SOCCA

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## President's Column

### Why Not SOCCA?

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As we head into the end of 2016, we find SOCCA completing a tricky three year transition from a subspecialty society affiliated with the American Society of Anesthesiologists (ASA) to one affiliated with the International Anesthesia Research Society (IARS) and from having our annual meeting in October to having it in May. In 2014, we produced a May meeting within 7 months of the previous October meeting, in 2015 we integrated offerings with the main IARS meeting, and in 2016 our meeting ran concurrently with the AUA meeting next door. Such a transition has been fraught with uncertainty, and although many were worried that SOCCA might not survive this transition, it now looks like we can breathe just a tiny bit easier.

For those of you keeping score, SOCCA meeting attendance averaged 193 registered professional attendees in the three years prior to the Big Move, fell to 83 (!) the first year afterwards, but has since rebounded nicely. In San Francisco this year, we counted 192 registered professional attendees … a number well within the 95% interval for pre-meeting attendance.

Even more encouraging is the steady increase in membership … from 651 in 2011 to 770 in 2016. Both active and educational memberships are increasing, suggesting greater interest among current and aspiring anesthesiologist intensivists. If trends continue as they have, the future will be bright. Perhaps anesthesia residents are realizing what we've known all along…that critical care is an exciting, rewarding subspecialty of Anesthesiology. One can only hope.

Of course, 770 is a bit behind from the estimated 900(+) SCCM members who self-identify as critical care anesthesiologists. From time to time I (and other members of the Board) are asked, "Why SOCCA?" Why another set of (mostly nondeductible) dues, another meeting, more email?

Let me take a moment to make the argument. As our website notes, SOCCA's mission (since 1986) is the education of anesthesiologists in the care of critically ill patients, and fostering the knowledge and practice of critical care medicine by anesthesiologists. Well, fine, you say, but is a society of anesthesiologists practicing critical care any different from a society of surgeons or internists?

I'd argue, "Absolutely!" As hospital based physicians, anesthesiologists participate in every type of critical care imaginable. Cardiothoracic, Surgical, Neurosurgical, Trauma…SOCCA has members who deliver care in all of these venues and more. The net result is that as you take your seat among the attendees at our annual meeting, the chances are high that the person sitting next to you practices a different type of critical care than you do.

A quick look at the poster list from our 2016 Meeting tells the tale. From malignant cerebral edema to air embolism after penetrating trauma to multiorgan failure after Vaporub inhalation, case presentations spanned the gamut of modern intensive care. And of course, cardiac critical care…with our 2016 Young Investigator award winner Dr. Loren Smith finding a potential association between HDL levels and acute kidney injury.

Again, a skeptic might ask, "So what?" To which I would respond that the cross pollination of ideas, strategies, and clinical pearls is often how problems are solved and medicine evolves. A historic example is application of the OR anesthesia principle "titrate down" to ICU sedation, leading to the introduction of daily sedative interruption in 2000 (co-authored by former SOCCA president Dr. O'Connor), which triggered a revolution in sedation management that continues through today.

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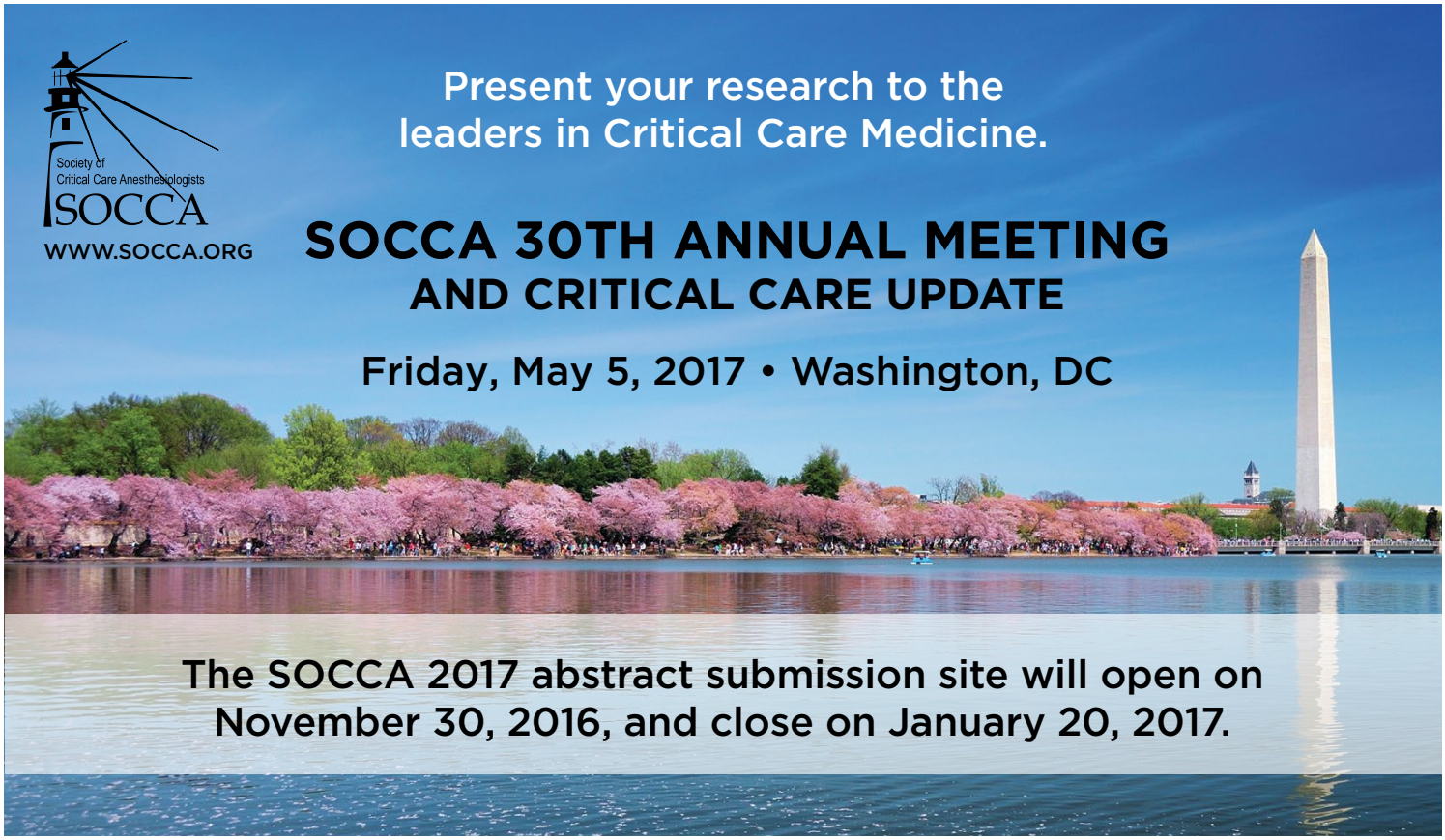
Examples today might include use of targeted coagulation management (different in liver, trauma, and cardiac critical care) and assisted circulation (expanding from cardiac surgery to other critically ill patients). What enables unique cross pollination in SOCCA is our common language as anesthesiologists and intensivists, and our (relatively) small size. Finding someone with expertise in the question you have is often no more than a friend of a friend away. In helping me solve a local challenge with immunosuppressive administration during cardiac transplant, for example, the SOCCA network gave me multiple solutions in just a few days.

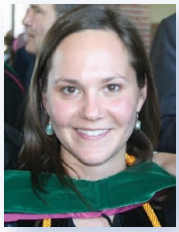
In addition to the annual meeting, SOCCA provides educational content at the IARS annual meeting, contributes (heavily) to Critical Care learning tracks at both the ASA and IARS annual meetings, produces an ICU resident learning guide, manages the yearly Anesthesia Critical Care Fellowship Match, and publishes this newsletter.

As this newsletter will go to press just beforehand, I'd like to highlight contributions by too-numerous-to-name SOCCA members to the upcoming ASA annual meeting. And, of course, SOCCA is proud to note that this year's ASA Presidential Scholar winner is Dr. Hanna Wunsch, a SOCCA member and the SOCCA Young Investigator winner in 2006. Dr. Wunsch will be discussing her work on Monday Oct 24, and participating in the FAER panel on "big data".

As incoming president, my hope is to encourage these aspects of SOCCA that make it, in my opinion, one of the most interesting and dynamic societies to which I belong. In these upcoming two years I plan to define the depth, and particularly the breadth of SOCCA's clinical activities, and to help SOCCA continue to serve in its role as fostering the knowledge and practice of critical care medicine. I hope you will join us!



# What was Ancient is New Again



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Since before Hippocrates, physicians have described the impact of respiratory failure and suggested modalities for treatment. Largely described as "pneumonia," respiratory failure was described by Hippocrates in the following way:

> *"Peripneumonia, and pleuricic affections, are to be thus observed: If the fever be acute, and if there be pains on either side, or in both, and if expiration be if cough be present, and the sputa expectorated be of a blond or livid color, or likewise thin, frothy, and florid, or having any other character different from the common."*[1]

In these ancient times, there were three recognized respiratory problems: tuberculosis, asthma, and pneumonia. Treatment regimens ranged from bleeding, to certain herbs and teas, and even wine. Hippocrates could not have imagined the modalities we have today to treat this disease recognized so many years ago; could he have imagined how far we have come?

Many "salvage therapies" have been initiated for the treatment of profound progressive respiratory failure. These include prone positioning, nitric oxide therapy, Oscillatory and High Frequency Ventilation, and Airway Pressure Release Ventilation (APRV). More recently the use of Extracorporeal Membrane Oxygenation (ECMO) has seen a surge of interest, support and growth.

ECMO is not a new technology, and neither is its use for respiratory failure. In 1972 a case report in The New England Journal of Medicine detailed the recovery of a 24 year old male trauma patient.[2] He had subadventitial transection of his aorta and multiple orthopedic injuries and developed respiratory failure on hospital day four after repair of his aorta. He was placed on venoarterial (V-A) ECMO for 75 hours with improving $PaO_2$, decreased $FiO_2$ requirements and decreased airway pressures. Although his neurological status was slow to return, it was reported that he achieved baseline three weeks after decannulation.

Seven years later, Zapol et. al reported in JAMA the results of a prospective randomized multi center study using V-A ECMO to treat respiratory failure.[3] 90 patients were randomized to conventional mechanical ventilation and V-A ECMO. Only 4 patients survived from each group. The paper was criticized for a few reasons. First, the study included no standard ventilation strategy. Second, even the use of V-A ECMO was criticized for its perhaps deleterious effects on the lungs themselves. V-A ECMO bypasses the lungs and heart thus producing a low flow state in the lungs that despite anticoagulation could result in microemboli due to stasis. While the study concluded that V-A ECMO improved oxygenation but not survival, perhaps a more apt summation was that survival was no different between conventional treatment and V-A ECMO.

It would be a number of years later that large studies involving ECMO for respiratory failure would come back into vogue in the literature. While use of ECMO was taking off in the neonatal and pediatric populations as a management tool for respiratory failure, it was slow to take hold in the adult populations. Experience with the modality was reviewed in 2000 by Bartlett

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## *What was Ancient is New Again*

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et al. in JAMA.[4] They retrospectively reviewed their single institution data from Michigan. They noted that the use of ECMO in neonates began around 1975-1985, really started to take off for the pediatric population in the early 1980s and by the 1990s the adult population. Of the 1000 patients reviewed in their dataset from 1980 to 1996, 146 were adults being treated for respiratory failure with some form of ECMO (VA or VV). However, the adult survival rate of 56% was dismal compared to the survival rates in neonates (88%) and pediatric patients (70%). In 2009, Massachusetts General Hospital reviewed their data for use of ECMO for respiratory failure similarly to Michigan's reflection on its use 9 years earlier.[5] They found the overall survival rate of adults with respiratory failure managed with ECMO to be 53%. Analyzing their data further showed that older age, prolonged ventilator time prior to the initiation of ECMO (>10 days), multi system organ failure, and long pump runs were associated with a poorer survival rate. Interestingly (and perhaps foreshadowing some data to come), they found that the survival rate was better (78%) for patients with a viral pneumonia. Lastly, in another review of retrospective data, the Extracorporeal Life Support Organization reviewed their database of 1493 patients who had received ECMO for respiratory failure.[6] They concluded that the survival rate was again barely better than the flip of a coin at 51%, and noted that younger healthier patients did better and that initiating treatment early (i.e. decreasing the amount of pre-ECMO ventilator time) was associated with better outcomes.

Finally, 2009 saw the publication of a prospective randomized trial of Conventional Ventilation or ECMO for Severe Adult Respiratory Failure (CESAR).[7] The RCT was conducted in the U.K. between 2001-2006 and randomized patients at 68 area hospitals to conventional management versus transfer to a single center which had ECMO as part of its treatment algorithm. They concluded that transfer to a center with an "ECMO based management protocol" could improve survival. The trial importantly did not conclude that ECMO improved survival. In fact almost a quarter of the patients in the ECMO arm did not receive ECMO, but were only transferred to the ECMO capable center. This begged the question: was it the expertise at the single center that improved survival and not ECMO itself?

2009 was a big year for respiratory failure and use of ECMO for reasons other than the results of the controversial CESAR trial: The Swine Flu pandemic. These data were reviewed by multiple countries after the pandemic and again seemed to show that referral to ECMO capable centers improved survival, that if ECMO was initiated it was better if it was initiated earlier, younger people did better, and survival rates in this particular subgroup of respiratory failure (viral pneumonia) were higher than what had previously been reported in the literature for all etiologies of respiratory failure.[8-9]

However, current data are not sufficient to conclude that the use of ECMO is any better than conventional approaches for patients with respiratory failure. A trial is underway to try to determine if ECMO for respiratory failure improves survival. The study, the EOLIA Trial or Extracorporeal Membrane Oxygenation for Severe Acute Respiratory Distress Syndrome, hypothesizes that early initiation of ECMO for respiratory failure (ARDS) will improve morbidity and mortality. While the medical community anxiously awaits the results of this trial, ECMO is already flourishing, with many new centers being started, and more patients being treated with this modality.

The jury is still out on whether ECMO will be the magic bullet for the ancient disease of respiratory failure. Surprisingly, Hippocrates may not have been as far off as we once thought when he treated patients with pneumonia with bleeding; he just hadn't realized yet that he also needed to oxygenate the blood and put it back into the patient for it to be effective.

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# The Value of SOCCA Membership

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Since its inception 1986, SOCCA has been focused on the unique concerns of Anesthesiology-based Critical Care Physicians. Over this time frame, our specialty has held strongly that attention to detail in the ICU, similar to the minute to minute care we provide in the operating room, leads to superior outcomes when applied across the range of critical illness and the perioperative continuum.

The Board of SOCCA has just completed a thorough review of our Mission, which has been dedicated to the education of anesthesiologists in the care of critically ill patients and to foster the knowledge and practice of critical care medicine by anesthesiologists. This has been accomplished over the years through education, advocacy and community.

On the surface SOCCA membership offers unlimited access to our Critical Care Medicine Resident Guide and a subscription to this Interchange Newsletter. But is there additional value to the 770 members of SOCCA going forward? Our review identified 5 key areas that are available to every SOCCA member.

***1. Focused networking with liked-minded Anesthesiology-CCM professionals for teaching, academic, research, and clinical pursuits***

The first key value is access to networking with leaders in the fields of Anesthesiology and Critical Care Medicine. We are fortunate that our membership includes leaders in these areas, but more importantly, leaders that understand the importance of mentoring and growing our future Anesthesiology-Critical Care Intensivists. Any member of SOCCA can find the right connections simply by first reaching out to anyone they know within SOCCA. You will quickly get connected to the best contacts to learn more about educational pathways, job opportunities, speaking opportunities, or research networks.

***2. High quality educational offerings***

The main educational offering is the Annual Meeting which was held this year on Friday, May 20, 2016 at the Hilton San Francisco Union Square in conjunction with the International Anesthesiology Research Society (IARS) Annual Meeting. We had 192 Professional Attendees at this Meeting. Highlights of the Annual Meeting included Sessions on Advanced Support Devices for Failing Organs; Big Data in Critical Care; The Role of the Anesthesiologist–Intensivist in Health Care Reform; and Late Breaking Results from the Critical Care Research Networks.

The SOCCA Annual Meeting is one of those rare venues where many of the people you need to know within the field of anesthesiology-based critical care get together in one room.

***3. Academic career mentoring and development***

Academic mentoring is hard to come by, particularly truly outstanding mentoring. We are fortunate that our SOCCA membership has many outstanding faculty both nationally and internationally. We have ICU Directors, Chairs of Departments, Journal Editors, as well as internationally renowned researchers active in the Society all of whom understand the importance to our collective future of ensuring that we develop our future faculty, leaders, teachers, and researchers. Many SOCCA members have benefited from this mentoring, and today the opportunities for mentoring are stronger than ever as the membership continues to grow, and our relationship with IARS develops.

Anyone who wants to get help with their academic career should feel comfortable using the network within the SOCCA membership to find the best mentoring available.

***4. Inspired involvement by medical students, residents, and fellows***

At many larger association meetings, getting involved as a medical student, resident or fellow can be very difficult. And even if you do get a chance to present a poster or give a talk, you are disappointed to find that your session is in some remote part of the meeting away from the action.

Not so at SOCCA. Our Annual meeting consistently includes a poster session for all abstracts with no other activities at that time, right in the heart of the meeting. Keep in mind that you can also present your poster at IARS as well, all in one trip!Additionally, there is the opportunity to participate in mentored writing, with the SOCCA Interchange newsletter ready to publish your original work.

***5. Exemplify the perioperative surgical home model in our everyday clinical practices***

As health care reform continues to pressure all of us and how we practice, the concept of a surgical home continues to be promoted by many as the best way to survive as an anesthesiologist. The concept is to leverage our expertise as perioperative experts to optimize preoperative conditions, prevent complications, reduce the cost of care, and improve the patient experience as a result.

Fortunately, many SOCCA members already practice like this, in keeping with the principles that prompted the inception of our Society. What is exciting is that within our membership we have representation from a diversity of practice environments, including academic and private practices, cardiovascular, neuroscience, transplant, surgical, and medical ICU settings, and reputable longstanding ICU programs, as well as newly formed ICU groups.

# SAVE the DATE

## SOCCA 30th Annual Meeting and Critical Care Update

**Grand Hyatt Washington**
**Friday, May 5, 2017**

Society of Critical Care Anesthesiologists
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**Join the Leaders in Critical Care Anesthesiology at the SOCCA 30th Annual Meeting and Critical Care Update in in Washington, DC!**

# Rhythm vs. Rate Control – Equipoise Found?

***Gillinov A.M. et al. Rate control versus rhythm control for atrial fibrillation after cardiac surgery. New England Journal of Medicine, 2016, published online April 4th.***

When broad-based trials are first conducted comparing two treatments for a common disease, the initial results can be very useful, but often create a new set of questions. One of the most critical is whether the results will hold when looking at the disease in a different context or patient population. In the case of atrial fibrillation (AF), there is a long-standing discussion as to which of two parallel approaches to treatment is optimal: trying to maintain sinus rhythm, or simply keeping the ventricular rate controlled. Rhythm control has some attractive attributes, as sinus rhythm has the potential to improve exercise tolerance, stroke risk, and survival; however, these benefits have not necessarily materialized in trials and the drugs and procedures used to achieve rhythm control can have substantial side effects. Two large randomized clinical trials (RCTs) comparing rhythm and rate control strategies, RACE and AFFIRM, were published in 2002 and found very similar results: both approaches produced similar overall results, although there were some concerns for worse outcomes, such as more hospitalizations and adverse drug effects, when rhythm control was attempted.[1,2]

While these trials helped establish rate control as an acceptable approach in ambulatory patients with AF, there are several groups that were not addressed specifically in this research. One of the major ones was patients developing atrial fibrillation after cardiac surgery. This is an important group to examine, as atrial fibrillation occurs in 20 to 50% of patients after cardiac surgery and is associated with increased mortality, complications, and costs.[3] In addition, there are several attributes of CT surgical patients that may change the risk-benefit ratio of rate vs. rhythm control: such individuals may have cardiomyopathy or left ventricular hypertrophy, which make the atrial kick more critical to maintaining cardiac output, and they may have a greater risk of bleeding when anticoagulation is initiated. Several studies have evaluated prevention of postoperative AF, but no large RCTs had addressed the question of its treatment until recently. The study up for discussion here, which was carried out by the Cardiothoracic Surgical Trials Network, was designed to evaluate whether rate control or rhythm control would prove more beneficial for patients with new-onset AF after cardiac surgery.

The study by Gillinov and colleagues was conducted via a network of 23 sites in the United States and Canada. Patients were considered eligible if they were hemodynamically stable, had no history of atrial fibrillation (to avoid changing their established treatment regimens), and were undergoing elective cardiac surgery. Patients who had postoperative AF that persisted for more than 60 minutes or recurrent episodes of AF were enrolled. Exclusion criteria included planned surgeries other than coronary artery bypass grafting (CABG), valve surgery, or a combination thereof; contraindications to amiodarone or warfarin; and need for long-term anticoagulation.

After enrollment and randomization, patients in the rate control group received medications to slow ventricular rate with a goal of less than 100 bpm; they could be switched to the rhythm control strategy if their provider deemed it necessary. The rhythm control group received amiodarone and could also receive rate control medications as needed; cardioversion was suggested if AF persisted greater than 48 hours after treatment was initiated. Discontinuation of amiodarone was allowed for drug-induced adverse events such as bradycardia, QTc prolongation, liver dysfunction, or neuropathy. Patients who remained in AF or had recurrent episodes 48 hours after randomization were recommended to receive anticoagulation with warfarin for 60 days. Notably, the researchers defined readiness for discharge both in the usual sense but also from an AF standpoint, to avoid confounding due to the many other complications that can occur after cardiac surgery. AF-related discharge readiness criteria included resting ventricular rate less than 100 bpm and, for the rhythm control group, that they had been fully loaded with amiodarone.

The trial's primary end point was number of days spent hospitalized within 60 days of randomization, which was intended to capture differences both in length of stay and readmission rates. Secondary outcomes included duration of index hospital stay (as indicated by AF-related discharge readiness), readmission, heart rhythm and time to conversion to sinus rhythm, need for pacemaker placement, and rates of death and adverse events. The primary endpoint was tested in an intention-to-treat analysis using the Wilcoxon rank-sum test. Poisson regression was utilized to analyze rates of adverse events and Kaplan-Meier and log-rank tests were used to examine time until rhythm conversion.

A total of 2109 patients were enrolled preoperatively; postoperative AF developed in 695 patients, an event rate of 33%. 523 of these patients underwent randomization (it is difficult to determine from the article and appendix why the remaining 172 patients were not randomized except that a larger proportion of them "did not meet eligibility criteria"). The two groups were well-matched in terms of age, sex, medical history, medication use, surgical procedure performed, and bypass and cross-clamp times. AF occurred in 28.1% of patients undergoing isolated CABG, 33.7% of those undergoing valve surgery, and 47.3% of those who had simultaneous CABG and valve surgery. A large proportion of patients crossed over from one treatment group to the other: 24% of rhythm control patients did not receive a full course of amiodarone and instead received rate control medication; this

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## *Rhythm vs. Rate Control – Equipoise Found?*

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nonadherence was due to adverse effects of medication in 65% of cases and patient/provider preference in 35%. Likewise, 26.7% of rate control patients eventually received amiodarone or underwent cardioversion; this was due to ineffectiveness of rate control medication in 51% of cases, side effects in 29%, and personal preference in the remaining 20%.

By day 7 after randomization, 90.2% of the rate control patients and 90.8% of the rhythm control patients had returned to a stable non-AF rhythm. However, the total time spent without atrial fibrillation over those 7 days was significantly higher in the rhythm control group ($p=0.003$), indicating a faster and more consistent resolution of AF. The number of patients who were free from AF at hospital discharge was 89.9% in the rate control group and 93.5% in the rhythm control group, which were statistically similar values. At 60 days, however, 97.9% of the rhythm control group had been in a stable non-AF heart rhythm for the previous 30 days, but only 93.8% of the rate control group had achieved this goal ($p=0.02$).

Roughly half of the patients in the study received anticoagulation with warfarin. At hospital discharge, 42.7% of the rate control group and 43.3% of the rhythm control group had been prescribed warfarin, rates that were not significantly different. Interestingly, while 46.2% of the rate control patients met predetermined criteria for anticoagulation, this was only true in 31.8% of the rhythm control patients. The substantial difference between the number of patients in the rhythm control group who met criteria for anticoagulation and the larger number who received it was attributed to "additional considerations regarding the need for anticoagulation."

In terms of the study's main outcomes, the number of hospital days from randomization until 60 days was similar between the two treatment groups, with a mean number of hospital days of 6.4 in the rate control group and 7.0 in the rhythm control group. The length of the index hospitalization after randomization was also similar between the groups. These results remained significant when a sensitivity analysis was performed to assess the effect of treatment nonadherence, as well as when length of hospital stay was adjusted for AF-related discharge readiness. Rates of readmission for cardiovascular causes were similar between the groups (6.8 per 100 patient-months in the rate control group and 8.1 per 100 patient-months in the rhythm control group), as were rates of readmission for AF (2.6 vs. 3.9 per 100 patient-months, respectively). Five patients had died at 60 days post-randomization, three in the rate control group vs. two in the rhythm control group, which was not a significant difference between treatment groups (although these death rates seem somewhat low for cardiac surgery). Similarly, there were no significant differences in rates of serious adverse events overall, including rates of bleeding complications, pacemaker placement, stroke, and noncerebral embolic events. While "serious" pleural effusion was significantly more common in the rhythm control group; rates of overall pleural effusion did not differ significantly between groups, and a rough Bonferroni correction makes this result seem fairly unimportant.

So what are we to make of these results? Firstly, the authors have confirmed that postoperative AF is a common problem in cardiac surgery, even in patients who had no history of AF. On the other hand, this paper reassures us that AF is transient in the vast majority of such patients, since even the rate control group saw over 90% of its members convert to sinus rhythm by 60 days post-randomization. It seems that either rate control or rhythm control can be an acceptable strategy for postoperative AF, with neither approach leading to better outcomes but also neither causing more adverse effects, a real concern after the AFFIRM trial. One point that this study was not designed or powered to answer is whether rhythm control is preferable in certain subgroups, such as patients with left ventricular hypertrophy or severely depressed ejection fraction; physiology would seem to suggest that sinus rhythm is crucial in these groups. Another issue is the way in which post-discharge AF was evaluated: while the investigators used telemetry to evaluate the heart rhythm during hospitalizations, outpatient rhythm evaluation only consisted of an ECG performed in clinic at 30 days and 60 days. Therefore, it is possible that some episodes of paroxysmal AF were missed, but there is no reason to think that the rate of PAF would have differed substantially between the groups.

All in all, it seems the decision between rhythm and rate control for post-cardiotomy AF is one that can reasonably be left to the treating clinician, based on the needs of the individual patient. Rate control would appear to be a prudent initial choice, as it is simpler and many cardiac surgical patients will already be receiving beta-blockers, whereas rhythm control may be used if a patient cannot tolerate rate control because of hemodynamic instability or drug reactions. For the time being, there appears to be equipoise regarding this important treatment decision.

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# A Brief Conversation with … Avery Tung

Dr. Avery Tung, MD, FCCM is the 2016-2018 President of the Society of Critical Care Anesthesiologists. Dr. Tung is Professor of Anesthesia and Critical Care at the University of Chicago in Chicago, IL. In addition, he is the Quality Chief for his department, serves as the Critical Care Director of the Burn Intensive Care Unit at the University of Chicago, and is the Section Editor for Critical Care and Resuscitation for the journal, *Anesthesia and Analgesia.*

1. **What influences have been most important to your long-term approach to critical care medicine?**

   I spend a fair amount of time teaching, and like to think that I can identify critical care specialists by their tendency to view extremely sick patients as opportunities, rather than tragedies. As a resident I certainly thought that way, and all of the intensivists I've had the good fortune to learn from have had that ability to balance a recognition of how sick the patient was with a sense that getting better was possible. I was introduced to critical care by Neal Cohen at UCSF, whose encyclopedic knowledge of all aspects of critical care hid a passionate interest in the ethics and humanity of caring for patients on the brink of dying. As a fellow with Mike Rosenthal at Stanford, I learned the value of resuscitation and management based on physiological principles- identifying what was abnormal, fixing it, and giving the patient a chance to get better. In Chicago, my section chief Mike O'Connor showed me how often perseverance can win…and that (as he put it) the management plan is not infrequently to "keep the patient alive until they get better". Mike is also politically very thoughtful … and as our section grew to take on management roles in all of our perioperative ICUs, it was clear to me that he often thought 2 or even 3 moves ahead. I've tried to incorporate many of these lessons into my own practice. I've practiced long enough to see some real "saves", and also patients who just needed life support until they could get better on their own. I believe in the value of deep "vertical" knowledge … from ventilators to Centrimag VADs … and in management according to physiological principles. Finally, I've tried always to not lose sight of the patient surrounded by all the technology of a modern ICU.

2. **You have been the Critical Care director of the Burn ICU at the University of Chicago for a long time. What has been the most important lesson that you have learned from that responsibility?**

   I didn't learn how to manage burns during residency or fellowship, but rather on the job. At the time I was hunting for my first job, critical care anesthesia jobs were rare and I ended up in the Burn Unit at the University of Chicago. The learning curve was extremely steep…but in the end, Burn patients manifest so many of the standard paradigms in perioperative critical care: ARDS (inhalation injury), hypovolemic and septic shock (from the burn wound), metabolic and acid/base derangements, sedation, technical challenges (lines and airways), and (with the need to visit the OR on a regular basis) massive transfusion. And many of them survive to boot! The lesson I learned was that even when dealing with a relatively unknown landscape, an understanding of normal and pathologic physiologic responses to injury and the application of standard principles and strategies derived from perioperative care can go a long way. I think the tremendous diversity in practice environments among the SOCCA membership supports my argument. At the SOCCA meeting, a Neuro-ICU specialist might be sitting right next to a Trauma intensivist on one side and a Cardiothoracic ICU specialist on the other, with a SICU expert in front and an ICU director in back. I think it's clearly one of our major strengths.

   I have been around the block enough times to see treatments come and go, and as a frequent participant in CME the irony of teaching "A" and, 5 years later, teaching "not A" is not lost on me. As I get older I've come to see more truth to that practical adage, "If it's working, keep doing it, and if its not working, stop doing it!" than I used to.

3. **How do you maintain your level of enthusiasm for critical care medicine in your everyday practice?**

   I spend a fair amount of time teaching on the road, and see that today's ICUs are dynamic places where innovation is occurring at a surprising rate. The history of critical care from tidal volumes to lower transfusion triggers to sedation suggests that by the time the "landmark" article is published, many ICUs have already adopted a practice. It is sort of thrilling to think that the next big advance in critical care is likely already being practiced somewhere right now.

   Critical care also gives me the opportunity to teach students, residents, and fellows on a daily basis and to see this next generation of clinicians take an idea or clinical concept and move it forward. It is still exciting to see a learner grasp a concept … or, better yet, ponder an evidence gap. Those questions that start "How come we don't just…?" are often the best ones of all.

   It has also been exciting to watch the safety and quality revolution play out from the ICU perspective.

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## *A Brief Conversation with … Avery Tung*

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That CLABSIs can occur at a <1 per 1000 catheter-day clip … or CABG mortality approach 1% seemed impossible just 10 years ago. Unlike many who think medicine is a morass of misguided, error-prone clinicians making bad judgments, I think we can do unbelievable things today … and not infrequently think to myself, "20 years ago, this patient would not have made it."

**4. What advice do you have for fellows and junior faculty members as they begin to build their critical care medicine careers?**

Well, today's SOCCA is full of members far more successful than I who could probably offer more relevant advice. But I do think that fellows and junior faculty may make the mistake of moving too early into academic areas and not fully establishing their clinical reputations. Intensivists often practice in an institutional glass bubble where their every move may be watched by other services. Not establishing a reputation early can make it hard for junior faculty to then divert time to academic pursuits as they must keep defending their decisions.

I also definitely think it is OK if one's first project is not the topic of one's eventual R01 as a considerable amount can be learned from just doing. It may be easiest to start with what is going on in one's own ICU.

**5. Are there any last thoughts you might have for critical care medicine fellows and junior faculty members?**

I've found that I like myself better and am more effective when I think of myself as frequently wrong. It helps me recognize the value in other ideas and appreciate that more than one way often exists to solve a problem.

Not to put in an explicit plug, but as Critical Care Section Editor for *A&A* I'd note that *Anesthesia & Analgesia* has many outlets for both simple and complex writing projects. Let me know if you have a good idea!

**This interview was conducted by:**
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