Welcome to ASA Central Line, the official podcast series of the American Society of Anesthesiologists, edited by Dr. Adam Striker.

DR. ADAM STRIKER:

Welcome to Central Line. I'm your host and editor, Dr. Adam Striker. And today I'm joined by Dr. Aaron Primm. Dr. Primm is an editor for Summaries of Emerging Evidence, or SEE for short, and he joins me today to discuss some of the findings in the current issue. We're going to learn a little bit about a few recent studies, one that shed light on whether or not more aggressive patient warming reduces adverse cardiac events and another that illuminates how and if aggressive hydration has an impact on pancreatitis. Dr. Primm, welcome to the show.

DR. AARON PRIMM:

Thank you for having me. Dr. Striker It's great to be here.

DR. STRIKER:

If you don't mind, I'd like to first hear a little bit about your work with SEE. How did you get involved and what does your involvement look like?

DR. PRIMM:

Sure, yeah, I've been involved with SEE about four years now and just came across it initially just from the ASA Monitor. You know, amazing that the outreach works, really does. and so, you know, I contacted them, you know, wanted to get more involved in and kind of try to find a good entry point to some academic work and help with career development. And, you know, that was kind of like my step in the door, you could say. I was really surprised when I when I started that if you just kept doing the work and showing up and really contributing, you can kind of lead up to the role on the editorial board like I did. So it's a great program. I didn't need to know someone to get me
connected to them. It's really just the quality of writing and effort that you've put in can really show through. So it's been a great experience.

DR. STRIKER:

Excellent. Well, there's one item about intraoperative hypothermia and a recent trial that proposed that major cardiac adverse events would be greatly reduced by aggressive, preoperative and intraoperative patient warming. Before we talk about what they found, can you tell us a little bit about how that study was conducted?

DR. PRIMM:

Yeah, I'd be happy to. You know, this was called the Protect Trial. It was a multi-centered randomized controlled trial, and it was actually conducted at 12 sites in China and also the Cleveland Clinic.

Just for some background. There had been a lot of smaller trials, probably a couple decades ago, about hypothermia and kind of establishing the risks of myocardial infections, bleeding complications. And then more randomized trials in the 90s that kind of established these really increased rates of morbidity from perioperative hypothermia.

And the goal in this study was to really assess if there was an aggressive warming strategy that would be superior to just your typical warming strategy in the operating room. So to be eligible for this study. It was noncardiac surgery with general anesthesia, and it had to be for 2 to 6 hours, and patients had to have at least one cardiac risk factor. And then they assign them to the two groups. In the routine care group, they were not pre-warmed and the intraoperative warming only occurred when body temperatures drop below 35.5°C. But in the aggressive warming group, they receive full body warming for 30 minutes before induction of anesthesia and the body temperature was actually maintained above 37°C. And the two groups that they were trying to compare with just a degree and a half difference in temperatures.

DR. STRIKER:

Okay. What did they find? What was the primary outcome?

DR. PRIMM:

So the primary outcome they were looking for was actually a composite of myocardial injury, nonfatal cardiac arrest, and all-cause mortality within a 30 day time frame after surgery. So they were putting together these three things, looking at both of these
groups. And they total enrolled about 2500 patients per group. And what they found was that they had at least one of the primary outcome components in 9.9% of the aggressive group and 9.6 of the routine warming group. And so, you know, they really did not find a difference between the two groups. The relative risk was 1.04 value 0.69. So they really didn't find a difference between these two groups in terms of warming. So they concluded that we know that there's issues below 35 degrees, you know, these surgical site infections and bleeding. But this tells us that we don't really need to worry about aggressively warming patients to prevent major temperature related complications.

DR. STRIKER:

Let's go back and just review what the risks are other than cardiac issues with intraoperative hypothermia.

DR. PRIMM:

Yeah, of course. You’re worried about that myocardial injury, of course, because you’re having increased blood pressure, sympathetic activation, worsening that myocardial oxygen supply demand. And then that’s the big thing that, you know, they’re worried about acutely in the perioperative period. But there’s also risk with surgical site infections. You know with hypothermia, there’s reduced delivery of the immune cells that injure tissue. And then there’s less, you know, tissue oxygenation and even mild hypothermia will directly impair immune function and decrease antibody production. And the last thing that they kind of hit on with all these past studies is there’s a decrease in platelet aggregation and issues with the coagulation cascade and impairing enzymatic action. So the complication there is, as a coagulopathy, ultimately requiring increased transfusions perioperative. So the big three things: myocardial injury and surgical site infections and increased transfusion requirements.

DR. STRIKER:

Okay, so now let’s circle back and talk about were there any secondary outcomes from this study?

DR. PRIMM:

Yeah. And you know, like we just discussed, they really looked at all three of those issues and they also looked at hospital length of stay, 30 day hospital readmission. And the bottom line is that they really didn't find significant differences between them. Surgical site infections happened 7.2% in the aggressive warming group, 6.3% in the routine. Group transfusions were 10% in the aggressive group, 9.5% in the routine
warming group. So, you know, they're really showing that with this one and a half degree difference, none of these outcomes were different.

DR. STRIKER:

Right. Overall, then what should anesthesiologists take away from this new information when it comes to intraoperative hypothermia? Is it in general, we should still make great strides to keep the patient warm or we just don't have to go to great efforts to to overdo it?

DR. PRIMM:

Right, exactly. You know, I think what this is saying is that our standard temperature management in the operating room is correct in the sense that we are not causing harm by trying to be too aggressive. We know that there's issues with patients becoming very hypothermic, like below 35 degrees. But do we have to spend time, effort and resources to get them way above that, way above 37 degrees? No, this study would argue against that. You know, in a lot of other countries, it's not actually routine to use convection warming devices during surgery, and only in certain cases will they actually do that. And so it kind of follows our I would say our normal pattern of hypothermia prevention is to turn it on at the beginning. We usually keep them around 36, even though physiologically it's 37. But there's really no temperature related adverse outcomes from that strategy.

DR. STRIKER:

Well talk a little bit about that with other countries not using convective warming devices. I mean, what do they know that we don't or what do we know that they don't?

DR. PRIMM:

Yeah, I think it's really just it's just a resource management issue for the most part. When you have limited resources, there's probably a lot that just relies on what they've seen work and what they've seen not work. I think we have the luxury of being able to have better monitoring and these better resources available to us, you know, to just to make sure that we never dip below 35, 35.5 degrees.

DR. STRIKER:

Well, I do want to talk about the other study. So, if you don't mind, stay with me through a just a short patient safety break.
Hi, this is Dr. Jonathan Cohen with the Patient Safety Editorial board. Mitigated speech and incivility can both have negative consequences on team performance in times of urgency. Health care professionals should voice a concern at least twice to ensure it's been heard using an increasing level of respectful assertiveness. One tool for using graded assertiveness is to use cuss words. First, state your concern if the message is not received, explain why you are uncomfortable with the situation. Finally announce that there is a safety issue. Other acronyms for graded assertiveness exist, but whatever method you choose should be universally used at your institution so that the team gets accustomed to the signal words and understands their use indicates that there is a serious safety concern that must be addressed. Being as direct as possible while remaining respectful is the key to successfully communicating a threat to patient safety.

All right. Dr. Primm, just as warming addresses some perioperative issues, aggressive hydration is another recommended treatment for conditions such as acute pancreatitis and an item in the 39 B issue of SEE looked at a study that aimed to determine the difference in the development of moderately severe or severe pancreatitis with aggressive versus moderate fluid resuscitation. Do you mind telling our listeners a little bit about that study?

Yeah. So, you know, this is another study in that same vein. It's very similar in that it was also a randomized controlled trial, multicenter parallel group that was conducted in, I believe it was about 18 centers across four different countries. And it was called the Waterfall study. And, you know, a little background about this is that we know that early hydration was widely recommended for managing acute pancreatitis. But really, the, you know, the evidence for that practice is quite limited. And there really wasn't a sense of the volume or the rate of fluid administration, only that lactated ringer's was beneficial. And so this is kind of the starting point for this trial to try to figure out if there was any
advantage to a more aggressive fluid resuscitation strategy. So in this study, they had adults that came in with the diagnosis of acute pancreatitis no more than eight hours before enrollment and presented to the emergency department, no more than 24 hours after pain onset. And these patients were then randomized to either the aggressive or moderate resuscitation protocols. And when they came in with Hypovolemia, the aggressive group got about 20 mls per kilogram of lactated ringers over two hours, and then an infusion of three mils per kilogram per hour. When patients were assigned to the moderate group, they received 10mg/kg of lactated ringers and then had an infusion of 1.5ml/kg per hour. So half the rate. And then additional boluses were given in both groups if it turns out the urine output was low or the systolic blood pressure was low. And then at different timed intervals they use goal directed resuscitation and kind of assess the patients and adjust it as needed as they went along. And, you know, if there was a suspicion of fluid overload, they would stop or decrease the infusions. And their primary outcome for this study was the development of moderately severe or severe acute pancreatitis. You know, they wanted to see that if we're giving the moderate amount or the severe amount of fluid, how many of these patients would actually then go on to develop a moderately severe to severe acute pancreatitis? And, you know, the study really has the strength that they use a more realistic protocol in how patients would actually be assessed and treated during the admission. But they're really just altering these two different fluid strategies.

DR. STRIKER:

So what's the takeaway from that overall? What do you think?

DR. PRIMM:

Yeah. So the takeaway is that they didn't find a significant difference. Again. Of the two groups, they found that severe pancreatitis occurred in 22% of the aggressive group and in 17% of the moderate group. You know, no other noticeable differences were found in any of the clinical outcomes.

And what's actually interesting is that they enrolled about a quarter of the patients that they wanted to for an interim analysis, but it was actually terminated early by the Safety Monitoring Board because of a concern for fluid overload. So the fluid overload was seen in the aggressive resuscitation group in 20.5% of the patients, but only 6.3% of the patients in the moderate group. And these patients were overwhelmingly treated with diuretics over the other group as well. So they really found that having this aggressive strategy was actually hurting patients and they weren't seeing any positive outcome from doing that. There was also an accompanying editorial that came along with it. And what they really were pushing for is that, okay, now we know, you know, a better sense
of how much fluid to give to these patients and what should be done for them. So now let's shift to focus on pharmacologic interventions now that we've gotten over this barrier.

DR. STRIKER:

Well between the two studies. What's to be gleaned from these when you compare this one and the other one in general for the practitioner? Is there a theme? What do these two studies overall encompass in telling the general anesthesiologist?

DR. PRIMM:

There's a couple things. One of the big take home points is that sometimes finding no difference itself is very helpful for clinical practice. We don't have to be aggressive in warming patients or too aggressive and hydrating these patients. You know, they both kind of go on this theme of moderation in anesthetic care, right? Being overly aggressive just to see if it will help you isn't always the best practice, and sometimes it's associated with outcomes that are not safe for the patients. It's one of those everything in moderation kind of scenarios where we really have to take a slow and step wise approach to kind of approach these really important clinical questions that we as anesthesiologists come across every day. And they also have a study in 39B that we looked at that also showed that patients with septic shock when they receive a liberal or restrictive fluid strategy also had no differences in outcomes. So, you know, these these studies are kind of building on each other to say that, you know, we don't need to jump to the big guns, so to say right away. We can take a careful stepwise approach to to solve these problems and also keep patient safety in mind.

DR. STRIKER:

I do want to talk a little bit about how the information makes it to the SEE issues, just the mechanics of it, all of how the SEE selection and vetting works.

DR. PRIMM:

Yeah, of course. We have, I think in every issue, you know, we're looking over 200 articles from over 30 journals a month, you know, to put together this continuing education program that is worth 60 CMEs over a year, by the way. And, you know, we have a list of all these journals that we'll actually read through very carefully, try to select the articles that we think are pertinent to anesthesiology clinical practice or just practice in general for all physicians. Once those are selected, you know, the editor will send us out and we'll actually kind of dissect down the articles and try to make
questions for this educational product that people can, you know, read a question, try to answer it, and then really try to get hooked, you know, in what we're asking them. And it's not really trying to figure out if you know the answer or not. It's more trying to get you to think about this new thing that we think is interesting in this article that you might be able to take back to your practice, your institution and change the way you practice. So like we said, there's two issues a year and it's a great product and it's a great thing to be involved with.

DR. STRIKER:

And how does this compare to ACE? Somebody out there wanting to do one of those two programs that the ASA offers with regard to continuing education? What are the differences between the two?

DR. PRIMM:

ACE I think, is more, you know, reviewing the knowledge that is out there to keep up to date with your knowledge of the basics of anesthesia and to review your your knowledge. And know a lot of resident physicians will use it as part of Board prep. And it's a great way to remember things that you may have forgotten over over years of clinical practice. You know, the big difference with the summaries of emerging evidence is that we're really presenting the cutting edge of science in our field and, you know, we're getting you to think about the future of the specialty. And so they're kind of geared toward different audiences and different groups of physicians might feel they may get more out of one or the other. But I think it's great that the ASA has two different products that people with varying interests can get into.

DR. STRIKER:

And so how would you say the SEE, I mean, you've been in it for a few years. How would you say it's evolved over the years since you've been involved?

DR. PRIMM:

Yeah, I mean, actually, I came into the program as a writer. Never really had done the questions before. But, you know, it's been really a great personal journey for me because you really just start at the beginning just trying to glean the information, trying to understand what's happening, and you really kind of evolve over time to really be able to understand the concepts, the methods that they're using, the statistical analysis, you know, what makes for a quality study or not, and really knowing the things well enough to write questions that will really be interesting to the reader. And, you know,
over the years, you know, my personal experience, we've really been receptive to, you
know, the reader feedback. The people that are actually doing this online or doing, you
know, the paper version and trying to adjust it to the needs of, you know, our base of
anesthesiologists that love these products. Like I said before, you know, it's just a great
way to stay up to date with all the information that's coming out because, you know, who
has time to really read all these journals, journal articles and really, you know, get
what's pertinent to your practice from it. Um, and, you know, one of the former editors
on the board had said that, you know, it's probably the best journal club that you could
ever be a part of. And, you know, I tend to I tend to agree with that. Where else can you
really have such an intense dive into all these different articles from all these different
journals about anesthesia? So I think it's you know, it's been a wonderful experience for
me. And I would encourage anyone else that's interested to to take a look at it.

DR. STRIKER:

That brings up another question. If you're a subspecialist, does SEE cover all the
subspecialties fairly equally. How does that look?

DR. PRIMM:

Well, we you know, we certainly try. But there's there's there's always people that are
saying, oh, you know, there's there's too much pediatrics in this edition. There's too too
much regional anesthesia. There really is a concerted effort to try to have, you know, a
more even distribution of these topics. We're doing some more ambulatory surgery
questions, you know, in these upcoming issues, things like that. So there really is a
concerted effort. So we really do hear what people are saying out there. And, you know,
we hope that everyone finds something for them.

DR. STRIKER:

And then if you want to be a participant in the program, not just subscribing to it, but
maybe writing questions, get involved like you have. Where should our members go?

DR. PRIMM:

If you're an active ASA member, you can submit your CV to at see@asahq.org. Dr.
Wade Weigel is the editor in chief, and contacting him or anyone at through that route
would be an excellent way to start. And, you know, if you even just want to take a look
at the product itself and see what it has to offer, you can see it under the education and
CME tab on the on the main ASA website and you can find it there.
DR. STRIKER:

Excellent. Their program software out there to try to aid a physician in distilling down some of the more pertinent articles or scientific findings out there that are hard to to collate for one individual. It seems like the ASA is doing the work for you with this program. It certainly is quite a valuable resource for all the members.

DR. PRIMM:

Yeah, I'd agree. There's a lot of behind the scenes work and coordination with the staff and a lot of meetings and a lot of writing, so there really is a lot of work being put into the product. And you know, I think we, we hope that people can see the quality that comes through in the writing and and what people are able to to glean from from the product.

DR. STRIKER:

Wonderful. Well, Dr. Primm, thanks for joining us and not only sharing some insights about the SEE program, but giving us a look at the current issue and a kind of a sneak peek at what we can expect.

DR. PRIMM:

It was my pleasure. Thanks so much.

DR. STRIKER:

And for our listeners, if you want to learn more about SC, visit SC at ww.org/sc. Thanks to all of you for tuning in to this episode of Central Line. Please tune again next time. Take care.

(SOUNDBITE OF MUSIC)

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