



American Society of
Anesthesiologists™

Central Line
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(SOUNDBITE OF MUSIC)

VOICEOVER:

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

DR. ADAM STRIKER:

Welcome to another episode of Central Line. I'm your host and editor, Dr. Adam Striker. Our guest today is Dr. Dan Cole, Professor of Anesthesiology at UCLA and past President of the American Society of Anesthesiologists. We're going to be hearing more from Dr. Cole in the pages of The Monitor, so we've invited him here today to talk about his plans and his expertise, which is in the field of brain health. Welcome to the show, Dr. Cole.

DR. DANIEL COLE:

Thank you, Adam.

DR. STRIKER:

Well, I imagine most of our listeners probably already know a bit about you, but go ahead and tell us a little bit about your career path and uh, how your interest in brain health came about.

DR. COLE:

Well, in a nutshell, uh, I'm a neuroanesthesiologist, neuroscientist by, uh, training. I spent about the first 20 years of my career doing bench research, uh, a laboratory model of, uh, focal cerebral ischemia, and I've had a long-standing interest in neuroscience as it, uh, intersects with anesthesiology.

About, uh, 25 to 30 years ago, um, I got involved in organized medicine and quickly realized that, uh, this was an area where my efforts, uh, could have impact on healthcare, uh, broadly. And, uh, 15 or 20 years ago my career kind of took a left turn, so to speak, uh, leading to a broad engagement on, uh, national organized medicine

particularly the ASA, uh, that, uh, culminated in my being the ASA President about four years ago.

DR. STRIKER:

Excellent. Now you were involved in creating the Brain Health Initiative in 2015. Can you talk a little bit about the initial goals of that initiative?

DR. COLE:

Well, I've, I've always had a keen interest in, uh, patient safety and, uh, patient safety as I learned in my residency had a lot to do with medication errors, you know, getting your gas lines not switched, etcetera. Uh, but thinking even more broadly, patient safety, uh, is defined in preventable harm or harm that results from the processes of care. And preventable harm, uh, as several studies have shown in the methodology, is a little suspect. But several studies have shown that it is the third leading cause of death in the United States and we are a patient safety organization. We have skills in, uh, patient safety and our specialty is at the frontier of, uh, patient care, addressing what matters most to our patients, really their health span. Uh, we are no longer a specialty that is just induction to emergence, but we are a specialty that works as teams throughout the episode of care, vying to return the patient home with improved functional, psychological and cognitive health.

And so is I started to think about the year I was going to be President, you develop your agenda ahead of time. And so we put together a small group of people that, uh, were experts and thought leaders in patient safety that thought, what are some of the things that we can start focusing on, uh, that will have this, uh, broad impact? And there were a number of different areas that came up, uh, for instance, myocardial injury after non-cardiac surgery. But we ended up focusing on, uh, brain health, uh, which is of significant interest to every one of us, uh, certainly as we age. And we engendered to try and, uh, create a multidisciplinary group to work with providers, payers and the public, uh, to really create a program, uh, to minimize the impact of, uh, post-operative brain, uh, dysfunction in adults 65 and older.

DR. STRIKER:

I imagine, not only is it costly to the patients in terms of their, their function, but, um, to the healthcare system at large. I imagine this is an incredibly expensive issue, if not dealt with properly.

DR. COLE:

Yeah, well there is certainly, like you stated, uh, there is a, a human cost of this, but when you start to think about the healthcare system, there was a, uh, guidelines published by the American Geriatrics Society that, uh, about 2014 I believe, uh, that stated that, uh, delirium, just one part of postoperative cognitive dysfunction, is a \$150 billion problem annually, and about 40% of those cases can be, uh, prevented. And delirium, per se, is just a slice of the pie of, uh, post-operative, uh, brain dysfunction, and it certainly can lead to human costs, uh, outside of just the healthcare costs and reallocating 40% of \$150 billion to other priorities, boy, would that have a great impact.

DR. STRIKER:

Oh, absolutely. Well, looking back over the last few years, do you feel that you've achieved those goals, or at least, uh, gotten close?

DR. COLE:

Yeah, so we viewed this as a marathon, a, a long game, and uh, certainly we're not ready to spike the ball in the end zone. But to use the sports, uh, metaphor, are we have moved chains down the field. Uh, we've worked collaboratively with many organizations including patient groups like AARP to advance recommendations and increase the profile and kind of put out there best practices for, uh, healthcare providers, anesthesiologists and healthcare systems, uh, to minimize the impact of this, uh, potential problem.

DR. STRIKER:

Well, you're now contributing to ASA's Monitor on a regular basis, and I'm wondering how that came about? Is that something that's always appealed to you, or something that just came up recently?

DR. COLE:

Well, I've always, uh, been kind of a part of The Monitor, uh, through my roles at ASA, been asked to contribute to it a lot, and, uh, I certainly, uh, do think highly of The Monitor as a vehicle for information and communication about what's going on in the field. And when it came to, uh, brain health, about a year ago, I was, uh, asked to start to write a column on, uh, brain health. And course I, I jumped on that, and uh, that's certainly is a passion of mine and of keen interest to our patients and many anesthesiologists, uh, that I talked to. And so it's a, a, little unique in that uh, so far, I've been the soul author of this column only once. I've tried to solicit, uh, co-columnists to contribute, uh, to the diversity of this, uh, column, and the spread of information on, uh, many different topics as it relates to brain health.

DR. STRIKER:

You wrote an article for the November issue on the effects of anesthesia on dementia. Can you tell us a little bit about the key takeaways?

DR. COLE:

Well in short, again, I solicited two co-columnists, uh, from, uh, Mayo Clinic and, it went over data from a Mayo clinic, uh, database with these two primary authors. Uh, the, uh, findings of the studies and what, uh, we wrote up in the column, uh, suggest that anesthesia itself does not cause cognitive decline, but rather factors such as the underlying condition necessitating surgery, the inflammatory responses caused by surgery or major illnesses are really the key factor. And, uh, there is a deterioration in patients', uh, brain health as a large cohort, uh, but it's worth, uh, emphasizing according to these studies which are really well done, uh, that the magnitude of the, uh, decline is relatively small and that there is necessarily a key link, according to these studies, between anesthesia and surgery and a future, uh, diagnosis of, uh, Alzheimer's disease. But, there certainly are lingering concerns about how surgery requiring anesthesia acutely affects brain health and certainly the, uh, development of, uh, delirium.

DR. STRIKER:

What are some things we can do as anesthesiologists to help mitigate that risk?

DR. COLE:

Well, there is, there's a lot of things and, um, I, uh, would suggest that everyone consider a best practice pathway for these patients which involves, uh, preoperative assessment, optimization. Uh, certainly you can look at a patient's, uh, medications and I refer to a Beers Criteria of high-risk medications in the chronic outpatient-type setting, uh, which, uh, may have some impact short-term.

One of the worst offenders is, uh, using benzodiazepines. Preoperatively, uh, you can assess a patient for risk using things like the Mini-Cog exam, a frailty exam. Uh, there are prehabilitation pathways a patient can undergo for several weeks prior to a surgery, and you can get a geriatrician involved as a kind of, a steady-state throughout the, uh, total, uh, process.

Intraoperatively, there are some things that, uh, you can do. It's pretty controversial, but, uh, possibly depth of anesthesia making sure that you're not overdosing the patient, avoiding hypotension. There is no optimal anesthetic and it doesn't seem to matter

whether patients get regional, uh, versus, uh, general, and maybe even glycemic control.

But probably, almost as important, if not more important, is postoperatively when they wake up, making sure that these patients have the ability to get reoriented. And one of the things I always do, if I can, get a family member close to the patient in the recovery room, and in the immediate first, uh day or two, treat pain aggressively, make sure they get good sleep, get them up and about, and physical activity if possible. If they have hearing aids or glasses, put those in as quickly as possible. That gives sensory input to help kind of, uh, reorient, and if possible the sooner you can get them home into a familiar surrounding, uh, the better off they will be.

DR. STRIKER:

As anesthesiologists, you know, we like immediate gratification and seeing the results of our work right after a surgery, for instance. Obviously a lot of us practice, uh, in pain clinics and outpatient settings well, but this seems to me to be a problem that really illustrates the positive impact as a comprehensive physician that anesthesiologists can provide to, to patients, being that there is no one discrete medication to give, there's no one discrete anesthetic technique to provide. It's the comprehensive care and the persistent care throughout the perioperative period that ultimately can make the difference. Do you agree with that?

DR. COLE:

Oh, absolutely. I think you've stated that, uh, eloquently. I think when I first started off in, uh, anesthesiology, uh, medicine was a little bit more of a tribal type of, uh, organization, and, uh, you, know physicians, uh, Atul Gawande said it best in an article that he said, uh, physicians are no longer cowboys but pit crews, and by that I think he meant that, uh, whatever your knowledge, or how you want to interpret that, but we work together as teams in the best interest of the patient and that goes from soup to nuts, so that when a surgeon first makes a diagnosis that requires surgery then we start to work together in teams of 5, 10, 15 or 20 or more people may touch that patient throughout their perioperative period. And even when they get home, uh, there certainly can be, uh, home care and we are integral, uh, to, uh, that, that that care and we can oftentimes even lead, initiate and, uh, improve the care that the, uh, patient gets. After all, that's why we went into medicine.

DR. STRIKER:

What do you think about how brain health is currently being measured? Do you think we are doing a good job, um, or is it something we need to improve on?

DR. COLE:

Uh, there certainly are gaps, uh, to improve. Uh, there are fairly simple tests that can be a pretty good estimate of the measuring brain health without taking extensive psychometric, uh, uh, tests. One pre- uh, operatively that, uh, you know, a one that could take is the uh, Mini-Cog, which essentially asks the patient, or tells the patient three words, asks them to draw a certain time on a clock and they will draw that time or not. And then you ask him to repeat those words. And that usually takes about 2 minutes, and is a reasonable predictor of, uh, their, uh, brain health, um, actually after, after a surgery you can administer relatively simple tests such as the CAM-ICU which then can measure yes or no, is this patient having an, uh, episode of delirium and those things are not well subscribed to throughout the, uh, nation. And certainly we can improve on, uh, these, uh, tests, simply to, to improve the assessment of brain health.

DR. STRIKER:

We always talk about this is a problem in the elderly. Is there an age cut-off or is this something we should be attending to a lot sooner in adulthood then, then we have been?

DR. COLE:

Well, certainly I think anybody is at risk of, uh, having, but age is one of the, uh, strongest predictors and risks, of uh, having postoperative, uh, cognitive dysfunction and so, so age, and I kind of have a cut off of around 60 to 70, realizing that I took care of a patient that was 90 the other day that actually looked and cognitively was more like a 60 year old and you'll take care of 60 year olds that are like uh, 80 or 90. And so age is not an absolute, but uh, somewhere around 60 years old I start to get concerned about that risk and the literature would say about 65 to 70 is where the risk, uh, demarcation really starts to take off.

DR. STRIKER:

Gotcha, well I will understand there's an article on COVID and the brain planned for the January issue of The Monitor and COVID patients seem to be experiencing an array of effects on the brain from things like loss of taste, to confusion, and I was wondering especially now that cases are, at the time of this recording, the cases are certainly going up again all over the country. Do you have a sense of why that is, or any idea from your reading of the research on how COVID it impacts the brain?

DR. COLE:

Well, here's the, uh, literature and there is no definitive answer to your question. So I will kind of update with you, with what the literature is in November of 2020. Uh, certainly infections, per se, can cause neurological disorders and indeed if somebody has a neurological, an acute neurological condition, infection is usually a search for. But it remains unclear whether adverse neurological effects on the brain are specific to SARS-CoV-2 to or possibly even a more general phenomenon related to inflammation, cytokine storm, or the immune response that is the central driver of critical illness, uh overall.

Uh, SARS-CoV-2 is known to replicate the neurons and maybe actually enter the central nervous system by the angiotensin-converting enzyme 2 receptor. Uh, however, there is a case series of brain autopsies performed in patients with confirmed COVID that did not show any specific changes in the brain that could be directly attributable to uh, SARS-CoV-2.

Be that as it may, although a, a direct causal link between SARS-CoV-2 and neurological complications is biological plausible, the supporting uh, evidence is embryonic in nature, but the bottom line is that patients with COVID are well documented to have neurological, uh, problems. At least half of COVID patients present with, uh, neurological symptoms and certainly even more develop symptoms, uh, during their hospitalization.

And one, one final point is that we're understanding now that there are more patients now that are experiencing long COVID, or symptoms of COVID, not just neurologic, but symptoms that persist for months following infections. Uh, the neurological symptoms for a long COVID include fatigue, mood swings, cognitive difficulties and brain fog. Uh, long COVID may indeed impact population health. That is yet to be determined, uh, and may have, uh, you know, sustained consequences and an unanswered question now is that when is somebody, particular or after they've had long COVID, okay to come back for the stresses of surgery and anesthesia, and possibly, uh, undergo another inflammatory, uh, response? Again, the data is, is embryonic, but it is a big question that we need to answer.

DR. STRIKER:

How are researchers studying these impacts, specifically? Is it just clinical research based on, you know, case cohorts, or, or case studies? Or it is everything, laboratory pathologic?

DR. COLE:

Yeah. It's, it's all. I mean, I, I, there, there are certainly are a lot of uh, case series, uh, that are being, uh, published. There are very few randomized controlled trials, you know, with this, so that data is kind of lacking. And then there are laboratory studies that are done, for instance showing, uh, that SARS-CoV-2 can indeed replicate inside neurons, again which makes it biologically plausible that uh, SARS-CoV-2 can enter the patient's nervous system through the olfactory bulb and actually possibly remain, uh, in the CNS, although again, that has, has yet to be shown.

DR. STRIKER:

What are other topics you're most looking forward to addressing in the pages of The Monitor?

DR. COLE:

Well, the next one that's being planned and is being written up right now is a very controversial, uh, area and, uh, that would be the, the use of processed electroencephalograms to determine anesthetic overdose and how that may or may not affect the incidence of, uh, neurological problems, uh, postoperatively. A, another one that, uh, I think will be down the pike in the second or third article following that, uh, would, uh, be preoperative prehabilitation, and what are some of the things that have some reasonable amount of proof to do? What are some of the things that are plausible as far as having a positive effect, and what are some of the things that are kind of out there but really have no data behind them as far as optimizing the patient for a surgery and anesthesia.

DR. STRIKER

You know, you mentioned, um, using processed EEG to look at anesthetic depth and it seems that the evidence is certainly clear, um, correct me if I'm wrong, that the proper utilization of EEG during anesthesia is quite revealing as far as, uh, information in real-time about anesthetic depth, but I've always thought the, the kind of the knock on it was the proper interpretation piece and the ease of use during an anesthetic, hence, things like, you know, the BIS monitor that have come to the forefront over the years to try to make it easier to interpret that data and boil it down to a more simpler approach. But what's, what's your take on the overall use of EEG intraoperatively?

DR. COLE:

Very controversial and not a lot of evidence, I mean, there is evidence, uh, but not overwhelming evidence on either side. You can make that the argument for either side and I think you stated well that in general electroactivity in the brain correlates well to

anesthetic depth. Exactly what happens in a processed electroencephalogram and how it relates to the particular anesthetic or anesthetics you are using, is a little questionable. And how that depth of anesthesia relates, per se, to a neurological outcome postoperatively is, uh, fairly suspect in a large cohort of patients.

In general, uh, the way that I've interpreted the data for my practice, and this is my, my opinion, is that I would use a processed EEG on high risk, uh, patients to avoid overdose, which is something that I think in general we do not want to do, and to avoid underdose, which may actually also produce, uh, some harm in that underdose means the patient's light and they may be stressing, uh, the physiological system and the biology of the brain.

DR. STRIKER:

Well, Dr. Cole, you're obviously contributing to The, uh, ASA Monitor now quite a bit and I'm wondering, just to get your take on the new format, and your impression of how, how, uh, people are receiving it.

DR. COLE:

Well my position as a reader, I think it's spectacular. It is a great, uh, step forward. It's, uh, very readable. The, uh, articles are very, uh, relevant and I like the, uh, new revised, uh, format. That said, I am sure that, uh, the ASA is always trying to improve their products and, uh, certainly The Monitor is probably iterative in the sense of, uh, we are always open to feedback from the people who use The Monitor due to how we can best meet their needs. So again, as one of, uh, 50,000 people that read The Monitor I, I give it an A+.

DR. STRIKER:

Yeah, I, I've been impressed with it as well. And for our listeners, if you're interested in Dr. Cole's writings or any of, uh, the subject matter about brain health, please go to The ASA Monitor website asamonitor.org, and you can, uh, access all that information there.

Well, was there anything else you'd like our audience to know regarding brain health, initiatives, things we can do, things we'd like people to be aware of as we close out?

DR. COLE:

Yeah. I thank you for that, uh, question. I think in general we have an aging demographic in the United States of, uh, patients over, uh, 65 and that is only going to increase in the next, uh, two to three, uh, decades. These patients, uh, certainly are

highly concerned about their brain health and I get patients that come in all the time asking me, please don't do that again to me. I would rather, I've had a patient say, I would rather die than lose my memory.

And so while hard science isn't there to answer all of the questions, best practices and consideration by us, uh, the physicians who have responsibility for these, uh, patients uh, is there, and, uh, it is something extremely important to our patients and I would urge everyone to, uh, consider what the best practices are.

DR. STRIKER:

Well, thank you very much. How do you assuage those fears for those patients that are concerned? That is not an insignificant concern, and, um, I, I'd be interested to hear a little bit about what you tell them when they don't want to be put to sleep.

DR. COLE:

First, I think it's important as a human being and certainly a physician, to be honest, up front and transparent with them. After all, their body is the one, that you know, their, their humanness is what is undertaking the risk. And so I don't shy away from telling them what I think, uh, the real risks are, but they are here to have something that is needed, not uh, frivolous. And so we go over these statistics of what their chances are. So I do a risk assessment with them. Here are some of the things that I am going to do to really minimize the chances of this happening, and if indeed it does happen, uh, here are some of the things that we're going to do to kind of decrease the impact of this, uh, you know, on your life. So again, I think we owe the patient honesty and we owe them the best practice in November of 2020, or whenever you are taking care of this patient.

DR. STRIKER:

Thank you very much Dr. Cole. Um, this is such an important topic. It really does underscore the importance of what it is we do as, uh, physician anesthesiologists, and the kind of impact we can have our patients. So I appreciate you joining us today.

DR. COLE:

Thank you. Thank you for having me.

DR. STRIKER:

Well, this is Adam Striker, thanking everyone for joining us another on episode of Central Line. Please tune in again next time.

American Society of **Anesthesiologists**[®]

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VOICEOVER:

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