Vanderbilt Health DNA: Discoveries in Action
Season 2, Episode 2
I See You: Humanizing Critical Care

Dr. Wes Ely: I've been an ICU doctor for 30 years. And in the ICU, people are much more likely to be sedated into a coma. They're more likely to be tied down. And then we're like to be immobilized for many days on end, all of which are dehumanizing actions.

Dr. Carla Sevin: I realized how far we have to go in terms of explaining what life support is, what we do in the ICU, how close to death a lot of the patients that we see in the ICU are, and 30 years ago, many of the patients that routinely survived critical care or critical illness now would not have survived. So we're discharging sicker and sicker people back into the community, and they've never really had any sort of standard follow-up for the issues.

Dr. Shawniqua Roberson: Because the internet and social media has drawn our world closer in, even as things like the pandemic have sort of spread us apart. I think that has served to impact the ICU survivorship community by allowing them to reach out and network to each other, and to really be able to identify that, individually, they're not alone.

Clark Buckner: You're listening to Season two of Vanderbilt Health DNA, Discoveries in Action. I'm your host Clark Buckner. The reasoning behind the show's name is quite simple, the path to better health lies in our DNA. Discoveries in Action is about the big ideas and breakthroughs happening right here in Nashville, Tennessee, from Vanderbilt Health. Our drive to discover, care, learn and share is in our DNA. It defines who we are just as your DNA defines you. In this episode, we'll talk to three of the nation's leading critical care experts on how a stay in the intensive care unit can cause a ripple of long term effects and how research and new types of follow-up care, help critically ill patients maintain their dignity in the hospital, and at home in recovery.

COVID-19 unleashed an unparalleled volume of critically ill patients, straining hospital resources, overwhelming staff, and pushing ICUs to the limit. Dr. Carla Sevin, director of the UMC's Pulmonary Patient Care Center and director of the ICU Recovery Center has focused her career on improving the critical care experience, and how hospitals, patients, and families perceive the ICU. And prior to the pandemic she was confronted with how many people have a limited understanding of the life support provided an ICU's.

Dr. Carla Sevin: I think it's a struggle. We have some awareness campaigns, I think, to try to bring to light what critical care is. In the early days, we really focused on communicating that to patients and families, when you come to the ICU, this is what you can expect this a ventilator. With COVID the ICU really came into the public consciousness in a way that it really hadn't before and people were seeing what it means to be in ICU, what it is to be on life support. But that's something that we have to explain very carefully to patients, and families when they come into the ICU. Things that are very obvious to us as critical care

specialist are not obvious even to other specialties of medicine. And so when I see patients in the ICU, I try to explain to them and their families very specifically what we're doing.

I remember one case a few years ago where the patient unfortunately suffered a cardiac arrest while his family was in the room. And we resuscitated him with CPR. He was intubated. We started medications for shock. He got invasive lines. We had to do a merchant dialysis. And after all that, he was very, very critically ill and really being supported by all these life support mechanisms. And once things had calmed down a little bit, I went to check on his wife and she was talking on the phone with some other family and updating them. And she said to me how's he doing? Is he stable? And I said, "Well, he's critically ill, and he's just being sustained by life support", and her eyes widened. And she said, "He's on life support?" And I realized how far we have to go in terms of explaining what life support is, what we do in the ICU, how close to death a lot of the patients that we see in the ICU are.

Clark Buckner: Dr. Sevin describes the need for family awareness around the ICU, but what about the patient? That brings us to Dr. Wes Ely, co-director of Vanderbilt's Critical Illness, Brain Dysfunction, and Survivorship Center also known as CIBS. He specializes in critical care, delirium, and ICU outcomes. During the past 18 months, he's been on the front lines, caring for COVID patients. And here he explains how he tries to get to know his patients as people, even if they can't talk to keep them motivated to get well.

Dr. Wes Ely: Got a patient in the ICU who had blocked off the blood vessels to all of her arms and legs in COVID. And so her arms and legs were essentially dying. And she was on a ventilator and intubated too, with COVID, ARDS, and sepsis, this tremendous viral form of sepsis. And when we finally got her off the breathing machine and she was able to talk to me, she immediately, I said to her, not what was the matter with her, but what matters to her to switch that preposition from with to, to. And she said, "I have three children, and I love those kids. And that's what's getting me through this. And I will be there for them, be their mother and be aware." And she had this beautiful, big smile, and she told me that she appreciated me taking care of her. And no matter how much I told her, that I got more out of it than she did, she was just so thankful. And it was that human connection, that brain being on, not being delirious, because we had followed the bundle, and gotten her out of that delirium that made all the difference.

She went on to develop deafness from COVID several days later. And that was my first patient that had go completely deaf from COVID. It was harrowing, and to see that she maintained her mind absolutely as sharp as she ever was prior to being deaf from COVID. And we wrote on boards to talk to one another back and forth, and she could mouth words, she would read what I wrote, an she would mouth her words back, actually just say them out loud because she could talk to me. She just couldn't hear me. And that sort of resiliency and desire for life to serve other people, in this case, her children really grounded me and taught me that in the midst of the pandemic, it's all still the same, what matters the most, which is the human connection. Think about just the inexplicable richness of each person's life. And if you just think about the little tiny things in your life that nobody else knows about that were wins and losses, well, every person in critical care has all those experiences too.

And they cannot be depersonalized through some sort of a chamber where they all come through the ICU and they come in with color and sound and smell and noise and go through a depersonalization chamber. And now they're all just intubated, in a coma, immobilized in an ICU. We have to remove the depersonalization chamber and account for all the things that matter to that person. The main question I wake up wanting to answer every day is how can I help people recover fully so that their dignity is upheld. So that the unique pricelessness of every human being who comes under my care, or the care of someone else in an intensive care unit is respected with the reverence that it should be such that they feel fully human, and fully respected, and that they don't think that they lost part of themselves in the process of critical illness.

What the pandemic did for me, as a physician, was that it made me double down on seeing the whole person and seeing the person in the patient. I think that when I was in a non gray haired earlier doctor, I really, as I said earlier, was captivated by the technology and made sure I knew the doses of the drugs and how to do the procedures and all that business. And I still value all that, and that's what helps people get through a life-threatening illness. But just prior to the pandemic, I really had kind of come to a place in my life where I realized that I'm there to serve the whole person, and if I don't do that, I'm absolutely failing at my job no matter how well I know how to do procedures and technological things. What the pandemic did was it made me first get kind of scared.

I was scared of this organism that was invisible, and that could kill me too. But once I realized that PPE worked, and I was safe and I was able to focus back on the patient, it made me double down on the notion that it's not okay for us to use technology and remove the patient's family, for example. That family is not a luxury. Family is part of the healing plan. And that, how do I know that my drugs are more life-saving than the family? Because if the patient loses their will, because they're not with their husband, or their wife, or their children, then those drugs are going to fail. What I've seen in the COVID patients is that when they get that connection to family, that they start doing better, physically, and they start healing faster. And without that, how many people died in this pandemic from sheer desperation, desolation, and isolation? I would venture to say many, many thousands, and that's not good enough. And so that's why I've written about it and why I'm just going to be a squeaky wheel and kind of almost get obnoxious.

Clark Buckner: Being in the ICU often means the patient is close to death. People got occasional glimpses of the severity of illness as ICU's filled up in the pandemic. Critical care is a relatively new specialty that exists because of the boundaries of what can be survived, have expanded with technology.

Dr. Carla Sevin: Critical care is really a pretty young field. I think most people would trace it back only in the past 30 or 40 years, maybe to the polio epidemic of the fifties, where we started doing invasive mechanical ventilation using ventilators to keep people alive for respiratory failure. But really the first, what I would consider to be the critical care unit was a nursing intervention, Florence Nightingale in the Crimean war. You might remember the lady with the lamp. She really pioneered the concept that the

sickest patients should be nearest to the nursing station so they could have close observation. And really to this day, the reason people come to an ICU is for the nursing care, very close attention, and skilled technological support of organ failures. Critical care struggles, a little bit with itself as a specialty, because as the technological advances for organ support have improved over the past 30 years, we're saving more and more lives, and really that led to the specialty of critical care.

So, before we had a critical care specialty, an internist or a pulmonologist or surgeon might have been running the ICU, but as things got more and more specialized, we really needed people who specialized in critical care, and in managing ventilators and shock and heart failure and all of those things. But we a little bit sell ourselves short as a specialty, I think, and families don't really understand necessarily that the ICU is just not another place in the hospital, but truly a specialty of care. And in 2012, we set up an ICU followup clinic the ICU Recovery Center at Vanderbilt. And one of the problems that we had in getting patients to come back after they had been in the ICU is that they really did not understand that the ICU was a specialty area. They just saw it as another place in the hospital before they went somewhere else.

Dr. Wes Ely: If COVID had hit 20 years ago, the mortality rate, believe it or not would have actually been much higher, because right at the end of the nineties and early two thousands was when Gordon Bernard and I did the prowess trial, which was the first trial to ever get an FDA approved drug for severe sepsis. And that drug created the need for sepsis education around the country, right around the same time that that drug protein C was shown to save lives an investigator named Manny Rivers in Detroit, published a paper, which we called EGDT early goal-directed therapy. And that early goal-directed therapy paper in the new England Journal of Medicine accompanied by our paper on protein C, activated protein C in the new England Journal of Medicine, created a shift in thinking about sepsis. Such that instead of old style sepsis approach, we educated the masses of doctors taking care of critically ill people in the early two thousands to do aggressive resuscitation for severe sepsis.

And that is what created a wholesale improvement in sepsis survival across the country, and the world, such that septic shocks death rate went from about 60% prior to all that education down into the 40% range, and now is in the mid twenties. The reason that makes a difference for COVID is that had COVID hit with the tornado that has been, and the length and the severity of the illness that this viral form of sepsis is back before we did all that improvement resuscitation, instead of death rates in the 30 to 40% range, we would've had death rates in the 80% range, because we were already starting at 60 back then.

So we've gone from 60 to 80, whereas now we went from 25 to 35. What I have found out about 20 years ago was that when my patients came back to the clinic, and I saw them after the ICU, they couldn't find their car in a parking lot that couldn't bounce their checkbook. They couldn't remember names, they couldn't go back to work and they couldn't even remember how to turn on their computer, much less do their job. So we started to go backwards to kind of be a sleuth, and investigate why that would be. And we invented a way to measure delirium in the ICU, which we call the cam ICU, C-A-M, ICU stands for confusion assessment method in the ICU.

Clark Buckner: Physician scientists at CIBS, and colleagues around the world are finding new, better ways to protect the brain functions of people who are fighting physically to stay alive. In the last couple of decades, doctors began exploring what is happening in the brain in the ICU, whether it's a four day or a four week stay. People with COVID who got admitted to the ICU, typically stayed much longer than the average ICU stint. You might even know someone who spent some time on a ventilator. Dr. Shawniqua Williams Roberson, our critical care neurologist is focused on monitoring brain activity while patients are in the ICU. And by the way, we had an episode in season one all about the brain, check it out. It's episode four, where we got to hear neurosurgeons, share how the brain makes us who we are. And so it makes sense that brain's health, or the preservation of its health is critical to recovery from the ICU.

Dr. Shawniqua Roberson: We think the personality and the sort of identity of a person is largely seated within the brain, and that's not something that always was the case, right? Back in hundreds of years ago, it was thought that the liver was the seat of the ego, the identity of a person, but it's only with quote unquote modern medicine. And it'll be interesting to see what folks 2000 years from now think of our technologies and our theories, but based on what we see and know, it seems like the struggles that they're having after their critical illness, that lots of other people have these struggles and that even though some of their physicians might look and say, "Well kind of what you expect, you just went through a critical illness. Of course, you're feeling woozy or not really able to concentrate, give it some time", or conversely, "What do you expect?"

I want to know what is it that is going on in the brain during delirium. And what is it that goes on during that resolution of delirium that then causes, or I won't even say causes, but is associated with the cognitive problems that people seem to experience long-term coming out of the ICU. And specifically I'm aiming at looking at those questions from a perspective of, I will call it brain function, what I mean by that is how the populations of neurons communicate to one another, and the patterns of activity that they generate when they communicate to one another. We know that in various brain states and what I mean by brain states is wakefulness, sleep, wooziness, intoxication, there are certain patterns that are very evident and very measurable by electroencephalography. We call it, I mean, layman's terms, I might call it brain activity patterns.

We know that there are very sort of fast oscillations in the frontal regions of the brain during normal wakefulness, when a person is intoxicated, delirious, septic, on sedatives, et cetera. And we also know that when a person has delirium in the ICU, that this is associated with cognitive dysfunction in the long run. Further, we know that long-term cognitive decline, dementia and associated cognitive impairments are also associated with changes, but more subtle changes in the brain activity patterns. I postulate that there must be a link between the disruption in brain activity patterns acutely, and the changes in brain activity patterns that we see in the chronic long-term phase. And I'm looking to understand the link between those two. I think that'll be useful for two reasons. One is in order to sort of help predict who's most at risk for those long-term problems, outcomes. And also because there may be ways to capitalize

on that knowledge of of the links between those brain activity patterns, to try to manipulate those patterns in the interim and rescue people from that chronic decline that we see.

Clark Buckner: Understanding how people function in their daily lives is a challenge for critical care doctors. They can lose touch with patients after they discharge or even downgrade to lower levels of inpatient care. Yet, a stay in the ICU brings with it, the potential for cognitive, and physical repercussions that may have a sharp impact on a person's life. An ICU stay can deplete strength, bring on anxiety, depression, or PTSD, and alter cognitive functions.

Dr. Shawniqua Roberson: When we first started the ICU recovery center at Vanderbilt in 2012, we did that in response to, number one, some emerging evidence that was coming out around that time about the long term outcomes after critical illness. So we had just recently started following patients after they had been in an ICU to see how they were doing and measure things like did they return to work? Did they return to their normal function? How were their brains? How were their muscles? And what we were finding was really quite disturbing. It was very common for patients to have cognitive impairment after they had been critically ill, for whatever reason, not related to a brain problem, like a stroke or an infection in the brain, but just after having been sedated, for example, on a mechanical ventilator or getting some of the drugs that we needed to give them to save their lives. They weren't returning to work.

In many cases, they weren't returning to their normal strength or usual activities like driving, and being able to take care of their families and their homes, et cetera. And around that time, we had actually a family member of one of our ICU docs was admitted to our ICU and Art Wheeler was the director of the ICU at that time. And his family member was what I would consider moderately, critically ill at the time. And she got better. They went home. He had written an actual book on critical care, great book that I can highly recommend Essentials of Critical Care. And his wife was a nurse with critical care experience. They had insurance, they had money, they had education. And yet they really struggled with a lot of issues, sort of rooted in her ICU stay that she had after the ICU. And that was really the trigger for us to say, "Hey, if we can't do this, how are our patients doing?"

And we said, "Let's just start this clinic and bring people back." We didn't know exactly what they would need, but we work in multidisciplinary teams in the ICU, which is a fantastic way to practice medicine in my opinion. And so we brought some of those team members downstairs to the clinic, including our critical care pharmacists. We have a neuropsychologist, Jim Jackson, to help us address and screen for these cognitive disorders, post-traumatic stress, anxiety, depression, all issues we know are very common after an ICU stay and we measure their physical function and their breathing. And we just try to tie up the issues that are kind of dangling from the ICU. So, the ICU is the most intensive care you can get in the hospital. It's called the intensive care unit. And after people leave that intensive care, they stepped down to less intensive care settings like the regular hospital ward, long-term acute care, inpatient rehab, skilled nursing facility, which is like a nursing home. And some of them go straight home.

And that discharge to home is a huge drop-off. The system is really not geared to helping patients recover optimally from critical illness. Like I said, we suffer for a little bit from an identity problem where it is not widely understood that critical illness or critical care is specialty care. So there's no defined recovery pathway. Once you get better enough in the ICU to come off, life support, you might go to another hospital ward with a different team. You might go to inpatient rehab. You might make multiple transitions before you get home. And nobody really owns your recovery process. Nobody's in charge of you getting all the way better. We often will discharge patients to home with the instruction to follow up with their primary care provider in two weeks, that's problematic for a lot of reasons. One being a lot of people don't have a primary care provider. So, that's their first hurdle that you're putting on a patient who's already impaired, weak, tired, still sick, trying to recover.

Their family members have probably already taken off of work to try to be there for them in the hospital. So there's a lot of barrier to getting the right care. There are care pathways for other sort of life changing illnesses. Critical illnesses are life changing illnesses. Many people will not return to their normal life after they've been in an ICU and that's not widely recognized. For example, if you have a stroke, there is recommended post stroke care, you get rehab, you get swallow therapy. These care pathways are recognized, coded, and paid for by insurance. If you have cardiac bypass surgery, nobody's going to say follow up with your PCP in two weeks, you're going to follow up with your surgeon. Even if you have a perfectly normal labor and delivery and give birth to a baby, nobody would suggest that you don't have follow-up care for that. And in fact, that example is so codified that the whole prenatal care birth, and postpartum care are grouped together in one sort of billing code for insurance, because it's expected that you will have continuous care for this whole episode.

I hate to call it an illness episode, but it's an episode. It's life-changing, it changes your body, it changes your mind. And what do you get at a six week postpartum visit they're screening for depression. They make sure that you're not smoking. They make sure that this terrible event never happens again by providing contraception counseling. I joke, of course, I have two children myself, and it's a very happy event, but it mirrors a lot of the things that we try to do in ICU recovery clinic. It is a time when people have had a life-changing event, many of our patients in many Tennesseeans smoke and being tied down on a ventilator, might've been the longest period in their adult lives that they weren't smoking. So we need to grab that opportunity to make sure that they don't restart smoking when they leave the hospital. It's an opportunity for us to address things that are considered primary care type, preventative interventions, talking about drinking, making sure you get immunizations.

If you were on a ventilator because you had the flu or you had COVID, you may be more open to getting a flu shot or a COVID vaccine at that time, and we should be providing that. But there are also a lot of things that are just obvious to us as intensivists, critical care specialists. That are not obvious to people who don't routinely work in the ICU. The ICU is a strange planet that is not analogous to any other phase of healthcare. And that's why we are a specialty in the intensity of care. You go from 60 to zero on care intensity, and it's an opportunity for a lot of things slip through the cracks and for people to really stumble in their recovery from critical illness. So we saw that time period as a sort of a pertinent

opportunity to intervene and try to keep people on the recovery trajectory so that they would ideally get back to their baseline function.

Clark Buckner: There'll be another pandemic. I know you don't want to think about it, but tune into episode one, to hear from people who are constantly thinking about how to respond. It's really a matter of when and what contagion, not if. Critical care experts are wanting to make sure that even more people survive and thrive the next pandemic, or epidemic, or any other accident or disease that puts you in the ICU. We may be thinking about the ICU because of COVID, but heart attacks, car accidents, strokes, and a litany of other adverse things could land you in the care of a critical care.

Dr. Wes Ely: It's exciting, and it's sad at the same time. I mean, why did we become more aware? Well, because the pandemic hit and thousands and thousands of people lost their lives. However, we've been preparing for this for 25 years and what's good about it. And what makes me feel thankful that we had that time to prepare was that we have a better way forward. We are studying people every day. We have a bank of people calling COVID survivors to try and learn what are they suffering from and how can we do better going forward? And it's really that scientific foundation, I think, that will make us do better in 2030 than we're currently doing in 2021. Pre COVID and post COVID medicine, there's more similar to them than there are different. It's kind of like human noses. Noses come in, all sorts of shapes, colors, and sizes, but they all function the same.

So medicine, at its heart, is about serving other people and people haven't changed. What did change though? Where are ways of doing the service. So for example, post COVID medicine is going to have a lot more online. It's going to have a lot more Zoom. It's going to have a lot more virtual visits, but that won't be good enough for some people. And as fast as we can, we need to get back to in-person, human touch, eye contact. So there's going to be an amalgam of that. For example, I'll reveal a little bit about myself. I have had a lot of addiction in my family. And even though I don't have those personal addictions, I go to Al-Anon. And so in Al-Anon I have found that when we go back in person, Al-Anon is for people who want to process how to handle addictions within their family. So, we are going to have Zoom meetings and in-person meetings going forward. It'll have both.

And that's because now we have people who were in our Al-Anon I'm meeting, who live in California, Canada, and Europe, and they would never be able to come if it was only in person. I see the same thing happening with our medicine. In our COVID support groups, for example, in our CIBS center support groups, we have people from all over the country, in the world who get on with us in Zoom. So if we go back only person, they're going to be locked out. And so we're going to have some sort of an amalgam going forward and that's a new way of post COVID medicine.

Our goal is still the whole person bringing that whole person forward in the most healthy way that we can get them there. It's just that post COVID we're going to have numerous new options and approaches, and we're going to be more accepting of those approaches. Some of them are going to make us a lot more efficient and make us be able to reach people at greater distances. And some of them might be

unacceptable to some people because they will feel dehumanized by a screen and then they can get them in person.

Dr. Shawniqua Roberson: I've been told by a number of intensivists who aren't trained as I am in reading EGS and understanding what these brainwaves say, "Wouldn't it be nice to just have a monitor, some sort of a machine that can look at the EEG and spit out a number or spit out some sort of a warning sign that says, 'Warning, warning, patients getting close to delirium, you need to address this', or 'Greenlight all is good. You're doing good." What is kind of the holy grail for neuroscience. And for those of us who are really interested in neurophysiology is really being able to marry those two things. A technology that actually can show you all of the brain in its gory finite detail and show you how it's changing from one moment to the next.

Yeah, that would be really, really cool. And an opportunity for us to really delve into this as a priority and saying, "Hey lots of people are dealing with these issues and maybe dealing with them in the long run, maybe dealing with them in long-term. How do we help folks like that?" It also, unfortunately, provides for a lot of people who can contribute to that research by virtue of their own experience. And as we know, science only moves forward by learning from existing experience. I'm not going to try to infect people with COVID in order to find out how their brain functions, right? But learning from the experiences of those folks, who've had the misfortune of having it as extraordinarily important for helping the future.

Clark Buckner: In the past year, science led the discovery of multiple COVID-19 vaccines, providing a protective armor against the virus, yet skepticism of the vaccine remains, and Dr. Sevin sees the outcome in her Workday, even though she absolutely doesn't want to.

Dr. Carla Sevin: I see patients in clinic and I counsel them about the vaccine, and there's been a lot of resistance and, and untruth out there, but I've actually said to patients, "Do you really want to be the last soldier to die in a war that's already won? Get the vaccine."

Clark Buckner: To learn more about critical care research and connect with patients and families who have similar post ICU experiences visit ICUdelirium.org. Thanks so much for listening to this episode of Vanderbilt Health DNA, Discoveries in Action.

On our next episode, we'll sit down with some of Vanderbilt University Medical Center's foremost thinkers, to discuss the increase in colon cancer in younger adults. We're also going to talk about the role that gut microbes might play, and why this is a moment to smash the stigma of talking about poop.

To learn more about the show, check out episode extras and find more information about Vanderbilt Health and today's experts, visit listendna.com. You can also find us on Twitter at the UMC Insights, and all of your favorite platforms at Vanderbilt Health. And of course, don't forget to follow rate and review

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