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Vascular Access Devices: How to Make the Best Selection

Announcer: This is ReachMD. The following episode in the series, Vascular Viewpoints, is sponsored by Becton Dickinson – advancing the world of health. *Content for this series is produced and controlled by ReachMD.*

Here is your host, Dr. Jennifer Caudle.

JENNIFER CAUDLE: In the intensive care setting, long-term intravenous care outcomes hinge on selecting the right vascular access devices for the right patients at the right times. This is a pivotal responsibility for the vascular access team, but at the center of every care decision made by this team is the patient experience, and that experience is what we're going to focus on today for guiding best practices in vascular access device selections.

This is Vascular Viewpoints, and I'm your host, Dr. Jennifer Caudle. Joining me to explore patient-centered keys to intensive care is Dr. Gregory Schears, an Anesthesiologist and Critical Care Specialist at the Mayo Clinic in Rochester, Minnesota. Dr. Schears, welcome to the program.

GREGORY SCHEARS: Thank you, Dr. Caudle. It's a pleasure to be here.

JENNIFER CAUDLE: Well, we're excited that you're here, and let's start with an overview of, actually,

the multidisciplinary approach to vascular access care in the ICU setting. You know, which clinicians make up this team, and what are their complementary roles?

GREGORY SCHEARS: Multidisciplinary team to vascular access care means that you have people from every area of medicine or many areas of medicine that are involved in vascular access, so, and that's true in the ICU and outside the ICU as well to be quite honest. In an ICU setting, let's say if a peripheral IV catheter is being placed, I'll talk about insertion first, it may be the nurse, it may be a vascular access technician, it could be the physician. With central venous access, depending on the location and expertise, for PICC lines it may be a nurse-inserted, a PICC team insertion, or it might be in interventional radiology by an interventional radiologist, or if it's a central venous catheter like a right atrial catheter, it may be an attending physician placing it who could be a pulmonologist, anesthesiologist, surgeon. So, based on insertion, there's a large group of people that have a stake that participate in achieving access in an ICU environment.

JENNIFER CAUDLE: You know, and when we speak about the patient experience in intensive care, what are some of the main challenges that patients face along their care path that come to mind for you?

GREGORY SCHEARS: Care transitions are very important. If you're an Intensivist, you want care transitions to occur because usually that means transitioning from a high acuity/high severity to a lower level. So, any time you have a care transition, there are so many things involved – a reduction in monitoring, there's a transition of information between care providers, there's device choices, there may be a change in therapeutic goals. If the patient remains in the ICU and they're needing inotropes and other things and they had a right atrial catheter inserted at the beginning, that line may be maintained as long as it is functioning properly and it's not having a complication, but when a patient is undergoing a care transition, they may be continuing with not that right atrial catheter but maybe a PICC line or something to have ongoing stable access for fluids and antibiotics and whatnot, and they would likely not be on vasoactive substances anymore. So, that's one of the care transitions that one sees commonly with vascular access. It's not uncommon for intensivists like myself to consider within the ICU will transition early to an alternate access, will remove a right atrial or non-tunneled right atrial catheter and place a PICC and then allow the patient to continue with ongoing care with that stable access for less frequent blood draws and maybe parenteral nutrition or stable IV fluid maintenance or whatnot with that kind of a catheter, but care transitions are amazingly important …

JENNIFER CAUDLE: So, how does the patient's journey prior to even reaching the vascular access team influence your care decisions moving forward?

GREGORY SCHEARS: So, patients come to the ICU in many different ways. They could be a transfer

from the outside. Let's say, you know, as in a trauma patient, it may be an admission from trauma to emergency department to ICU. They could be an admission following a very large surgery, which requires ongoing resuscitation and monitoring for some period of time. It may be more of a medical ICU, and they're coming in because of an exacerbation of their heart failure or COPD. So, there are many different ways in which one comes to the hospital and into an ICU. And so each of these groups may have slightly different vascular access needs, and so from a vascular access team standpoint, if they're interfacing, if they're consulting or being requested to help with that patient, they must understand what the issues are and what the ongoing care needs are just like with any other patient, and then, subsequently, helping with choosing the right line.

JENNIFER CAUDLE: And let's connect this then to the subject of vascular access device selections, which we know as a topic itself can fill volumes, but given what we've talked about so far, how do you initially put your patient at the center of every vascular access device selection thought process?

GREGORY SCHEARS: Yeah, every time, you know, I practice what I preach. I assess the patient in terms of what their options are, and I make a list of what I believe are the therapeutic needs, and in an ICU environment, for example, I'm looking at what am I going to need now and on an ongoing basis regarding delivery of vasoactive substances, nutrition, fluids, other medications. Do I need central access? Do I need arterial access? Do I need dialysis? Do I need mechanical circulatory support? All of these things come to play in terms of what device choices, both vascular access device choices and other, for the patient. So, we must take a moment and really think through that right device as soon as we can early in the process and then provide best practice care and maintenance of that device to reduce the likelihood of complications, and in doing so, we will help reduce complications, we'll help reduce pain from repetitive sticks, and hopefully really drive down device-associated complications by optimally inserting, paying attention to best practice asepsis, and things like catheter to vein ratio and stuff like that. Altogether, that has to come to the mind of a modern-day practicing clinician performing vascular access in the ICU or outside.

JENNIFER CAUDLE: You know, one of the recurrent issues for any vascular access team impacting vascular access device selections will be the problem of blown veins. Can you speak to this and how your team works to reduce it from happening?

GREGORY SCHEARS: Yeah, it's a funny euphemism, "blowing a vein," and I'm not exactly sure what that means, but we say it. Let's say a peripheral catheter failure in this case, and peripheral IV catheters fail most commonly due to infiltration/extravasation or a mechanical obstruction or a phlebitis or a dislodgement. A midline placement in a large vessel could also have any of those failures. And how do we reduce it from happening? Well, I think as we better understand the interaction between

device and vessel, it's important for us to understand the position of the catheter tip. Is it against the wall? Is it near a tortuosity? Is it through a valve? These are things that we're currently not paying any attention to mostly. So, in the future, I believe we must pay attention to catheter to vein ratio, the relative position of catheter tip to other structures within the vessel, and what we're putting through them.

JENNIFER CAUDLE: Okay, great, and along those lines, can you speak then to the quality of life impacts that patients will feel stemming from this issue?

GREGORY SCHEARS: Oh, it's huge. You know, if you look at the Press Ganey scores going back to the early 2000s, a uniform dissatisfier of patients coming to the hospital is vascular access and a phlebotomy, and any normal person hates to be stuck with needles, and an example of a really poor hospital episode, as far as I'm concerned, is a patient getting repetitive IVs over the course of their care. So, it would be way better to more carefully choose your site at the beginning, pick an optimal device, and if there's going to be a need for ongoing care over a longer period of time, picking a device that could actually be stable over that time, picking the smallest external diameter to allow flow around the catheter to help preserve the vein and limit or reduce the likelihood of thrombosis, and putting the right medications through the vessel, so not putting substances that might induce phlebitis or thrombosis due to its local toxicity.

JENNIFER CAUDLE: Okay, so what would you say are some of your biggest concerns or pain points when it comes to making the best device selections for patients? You know, are there situations, for instance, where the choice becomes really complicated or unclear?

GREGORY SCHEARS: Yeah, it's a good question. I think making decisions in isolation or relying on algorithms to make decisions for you in isolation of the patient is ridiculous in my opinion because, again, it's just not going to work. You're going to be frustrated, the patient's going to be frustrated, and you'll be forced to the realization that you can't make it to the end with what you've got. So, it's so important for people to not be technicians but to be prospectively looking at what's in the patient's best interest. Understand the therapeutic goals, truly assess what viable venous targets they have, and make a decision about the right vascular access device choice. Putting in repetitive peripheral IVs, for example, in a patient that has long-term vascular access needs is just going to lead to veno depletion and making that patient a difficult vascular access, and that's just not right. We have to make the right device choice.

JENNIFER CAUDLE: Okay, excellent, and, you know, what kinds of resources or support do you bring into these complex situations where the device selection in conjunction with the patient's history and experience isn't really clear?

GREGORY SCHEARS: Yeah, the best thing to do is find a knowledgeable vascular access person. Your vascular access clinicians that are going to the meetings, reading the literature, understanding the issues, are going to be some of the best people to help make good decisions regarding the type of vascular access device choice. So, I think that's going to be your best in-house resource.

JENNIFER CAUDLE: And finally, Dr. Schears, before we wrap up, are there any other takeaways that you'd like to highlight for our audience concerning the ICU patient experience and vascular access care decisions?

GREGORY SCHEARS: These vascular access issues are similar across the entire care spectrum, and so, you know, the big bullet points are that whatever your choice is driven by what the patient needs, either what they need right at that moment or what you anticipate them to need, it is going to be best if you can pick a device that can be stable, can be properly inserted and maintained, and that ideally at the end of it, you still have an intact vessel that they can continue to use. So, we must, regardless of the ICU, OR, floor, outpatient –understand the patient's therapeutic need and choose the right device for that.

JENNIFER CAUDLE: Well, with those last comments, I'd like to thank you, Dr. Schears, for joining me today and thinking through patient-centered best practices and therapeutic approaches for the vascular access team. Dr. Schears, it was a pleasure having you on the program.

GREGORY SCHEARS: Thank you very much for this opportunity. I was happy to be here.

Announcer: The preceding program was sponsored by Becton Dickinson – advancing the world of health. To access other episodes in this series, visit ReachMD.com-slash-Vascular-Viewpoints. This is ReachMD. Be Part of the Knowledge.