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Using Current Vascular Access Guidelines to Improve Patient Care

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.

DR. JENNIFER CAUDLE: Vascular access guidelines and recommendations play crucial life or death roles in intensive care settings, providing evidence-based roadmaps that clinicians need to make better decisions. But while standards of practice in the ICU have steadily improved over time, the guidelines in this field haven't always seen eye to eye, and that has created some confusion and indecisiveness among vascular access teams. On today's program, we'll explore this challenge and consider ways to make more sense of the current recommendations and, by extension, improve patient care.

This is Vascular Viewpoints, and I'm your host, Dr. Jennifer Caudle. Joining me today is Dr. Gregory Schears, anesthesiologist and critical care specialist at the Mayo Clinic in Rochester, Minnesota. Dr. Schears, welcome to the program.

DR. GREGORY SCHEARS: Thank you, Dr. Caudle. It's a pleasure to be here, and I'm looking forward to the conversation.

DR. CAUDLE: Absolutely; I am, as well. So, I'd like to begin with some level setting. Could you give us a quick overview of the most prominent guidelines that are out there focusing on vascular access?

DR. SCHEARS: Certainly. So, many medical professional organizations have guidelines of some sort. One of my backgrounds is I'm an anesthesiologist, so the ASA has guidelines relative to vascular access. So probably the most clearly written and evidence-based guidelines come from the Infusion Nurses Society. It's really an excellent reference regarding suggestions related to multiple questions that a clinician may have relevant to vascular access. There are many other organizations, ASPEN, SHEA, that are out there that promote guidelines relative to vascular access.

DR. CAUDLE: So, looking across the spectrum from INS to MAGIC, and so on, from your experience, what are some key areas that are not in alignment, and do they create any downstream effects on ICU practices that you've seen personally?

DR. SCHEARS: In general, there is a lack of standardization across the different professional organizations. And part of that is because they have different areas of focus. So, for example, for SIR, Society of Interventional Radiology, they are going to have concerns related to central venous access more predominantly, whether it's placement of PICC lines or standard tunneled catheters, dialysis catheters, things like that; and they'll have a little bit different perspective based on how they do insertions and other things. With regard to the INS guidelines, Infusion Nurses Society guidelines, they're a little bit broader, more comprehensive, and the INS guidelines also include things that other organizations may not think about, including optimal dressing, really kind of focusing down on those kinds of issues. So, one of the problems that we have in vascular access is a lack of quality evidence-based material – evidence-based study. And consequently, there is a significant influence of expert opinion that drives some practices. So one of the things that I guess is new to this area is there is some bias, I would say, related to some of the MAGIC guidelines in terms of device choices. The group that put together MAGIC, I think a very strong scientific background trying to gather data, mostly retrospective, and trying to give advice to people that largely don't know which device to choose and other things. But some of the problems with it are that it isn't patient-based, so I think for the benefit it is providing, it's also creating a lot of confusion or misdirection. Any guidelines, I don't care who is putting it out, it has to start with the patient. You have to understand how many viable venous targets they have. And you have to have a point of care assessment of the patient at the time you're trying to decide what the best device is to complete the care episode.

DR. CAUDLE: So, Dr. Schears, let's focus on central line associated blood stream infections, or CLABSI, which we know is a big outcome measure and a primary driver of HAC scores in critical care. How would you say the various guidelines address CLABSI? And are there any fundamental

differences between them that we need to think through here?

DR. SCHEARS: Sure. So, this truly has been an area of focus. And I must say, we've made some tremendous progress in the area of CLABSI reduction in the last, let's say, decade or more. And the combination of the focus of better study, expert interpretation of the information out there, and BMF and others putting our feet in the fire to penalize institutions for poor performance; all of that together has really led to getting the rates of CLABSI really substantially down. That said, some of the issues related to the reduction in reimbursement, the issues related to reporting of CLABSI, has also led us in kind of a negative direction. And that is another key point, is try to have the best device for providing delivery of the fluids and medications over the care of a given patient. Because unattended consequences from our strategies related to CLABSI have been a reduction or sometimes suboptimal device choice and/or sticks and complications for patients in a different way. So, we continue to try to seek balance.

DR. CAUDLE: Well, that's very helpful. And just to kind of further that, let's talk a little bit about HAC scores themselves. Do the various guidelines approach or scale HAC scores differently in so far as their impact on device selections or procedure recommendations?

DR. SCHEARS: The guidelines, HAC scores, and financial penalties are definitely having an impact on device selection; there's no question. If, in an ideal world, you could place a device and it would be complication-free, and it wasn't going to get infected or whatever, we would be behaving completely differently than we are now. Nobody likes to get stuck multiple times, and we would have an optimal device over the length of their patient hospitalization. So with our current knowledge of best practice, we really need to make sure again that we're providing optimal asepsis every time we interface with the line, and to reduce or eliminate the CLABSI, and also to ensure that the insertion part of our lines are done pristinely so that we don't incur infection. Honestly, I think on the insertion side, we're doing so much better than we were historically. People get it. The bundles have really directed us well in terms of, you know, hand washing to maximum sterile barriers, use of ultrasound, use of chlorhexidine; all of that is great. It has really helped us to focus on what is important in doing the right thing for insertion. So I think we're doing pretty well there. Our weakness is the human interface with, for example, central lines. We must provide adequate asepsis whenever we're interfacing the line whenever we can. And we have to be cognitive of not allowing uncapped needles, connectors, laying in the bed that can potentially be pollinized. So we must up our game. We have to jump on if a dressing is soiled, immediately re-prepare the site and provide sterile dressing appropriately.

DR. CAUDLE: Okay. You know, I'm also interested in venous thromboembolism rates as another complication and how the various guidelines rationalize best practices for minimizing thromboembolic

rates. Are there any disputes here, as well?

DR. SCHEARS: I would say not disputes, but there's a growing knowledge base in this area. So, this is, in some respects, a simple concept. The concept is that any catheter that is placed in a vessel can cause some alternation in flow. It doesn't matter if it's a peripheral I.V. catheter in the hand or forearm, or a central venous catheter from the IJ down to the SVC, SVC/RA junction, or a PICC line traversing from the upper arm basilic into the SVC/RA junction, any catheter is going to have some impact on flow. Now, the current conventional thinking and some limited but very logical outcomes of papers would suggest that we have to pay attention to the catheter to vein ratio. Probably that optimal ratio is somewhere between 1 and 3. External diameter of the catheter to the vessel size should be maybe no more than between 30 and 45% of the vessel. Some studies that have paid attention to that issue have suggested that the rate of venothromboembolism is much lower. And on the flip side, if we place oversized catheters within vessels, we're going to cause stasis and potentially bias towards thrombosis. Going big is not the way to go; you must use the smallest possible external diameter catheter to impact the flow pathway the least we can. In the future, likely we will be paying attention to the flow characteristics in more detail of vessels, then matching size and flow with an optimal catheter and, in doing so, further help reduce complications.

DR. CAUDLE: Well, thank you for that. And our final question really is bringing us back to the broader view of the guidelines we started off with. So, in conclusion, do you have any take-away thoughts on how vascular access teams can better evaluate their respective strengths while keeping in mind some of the limitations that we've spoken about?

DR. SCHEARS: Well, I am a manager of a vascular access team, but if I were out there practicing – this is a great opportunity for vascular access teams to step up and really demonstrate their knowledge and help improve patient care. Because truth be told, your general practitioner out there under appreciates the importance of vascular access. And often, unless the patient has been chronically ill and repetitively coming to the hospital, they don't really understand what the issues are either, unfortunately. In the future, I hope we'll have better consumers, better knowledge for patient, and people understand the valuable service that vascular access teams provide by being able to do a proper up-front assessment, understand what the therapeutic goals are and device needs for a patient, and then optimally place and maintain that device over the time that the patient requires access. Vascular access teams can be consultants, a resource. And they really need to allow themselves to be that consultant, to allow themselves to elevate to a higher level, not be just technicians, but use that knowledge they have for the betterment of patients and to help educate all of those around them that don't have time to really be in depth. So, I'm hoping that vascular access teams will take this aggressively, and hospital administration will allow them to provide the valuable service that they can.

It's not just about placing catheters, but to allow them to be consultants.

DR. CAUDLE: Well, with these closing thoughts, I'd like to thank you, Dr. Schears, for sharing your insights on these current guidelines for vascular access and their impact on intensive care paradigms. Dr. Schears, it was great having you on the program.

DR. SCHEARS: It was an honor, Dr. Caudle, to speak with you. And thank you so much for spending some time with me.

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