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www.reachmd.com
info@reachmd.com
(866) 423-7849

Vascular Access in the ICU: Lessons Learned from COVID-19 Patients

Announcer:

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Here's your host, Dr. Charles Turck.

Dr Turck:

Welcome to *Vascular Viewpoints* on ReachMD. I'm Dr. Charles Turck and joining me to explore lessons learned in the treatment of COVID-19 patients using multi-lumen catheters is Dr. Nathan Gilmore, who is Chief of Services and Critical Care at Hoag Hospital in Newport Beach, California. Dr. Gilmore, welcome to the program.

Dr. Gilmore:

Thanks for having me.

Dr. Turck:

Let's dive right in with a big picture look at vascular access priorities during the COVID-19 pandemic. We know that critical care settings across the world have needed to respond to significant increases in demand for central line insertions due to severe infections. Would you speak to that challenge from your own experience and how it's impacted your team's vascular access decisions?

Dr. Gilmore:

Yeah, I think you described it pretty accurately. I think everywhere that's seen a significant increase in COVID-19 patients, is facing a similar challenge and that is a lot more patients with high acuity needs and those acuity needs include the need for better vascular access, across the board, and also for a long period of time. And that strain on volume and acuity leads to challenging decision-making that previously we didn't face frequently; every so often we would, but now we're facing it all the time, and a lot more of it. So, we're using more catheters. They're staying in longer and everybody's services are just strained to keep up with the increase volume.

Dr. Turck:

Now, understanding that the vascular issues in each case of COVID-19 are unique, what are some patterns or key considerations that come to mind around the use of triple-lumen catheters for patients, say in those patients who are ill enough to require prone positioning during mechanical ventilation?

Dr. Gilmore:

Yeah, we've use pronation positioning for ARDS patients before COVID, but obviously with COVID-19, we've had a lot more of them and for a lot longer. And so, these interesting, kind of tidbits of complexity, we've been able to pick up on and find repeated risks for things not working exactly how you'd want them to. And we found that positioning has been a significant contributor to a catheter's function. And, at times, the patients on their belly, prone, and their neck is turned, sometimes that influences significantly the functionality of the catheter. Whether it's a dialysis catheter, they used to have pretty high flow rates to function with your dialysis machine. Or even a traditional three-lumen catheter that's used for infusion of medications. You've got to make sure that it's flowing effectively and not occluding based entirely on position, many times. That being said, there's also this increased risk of clotting from COVID-19. There are other infections and inflammatory states that can have this type of risk, but COVID-19 has been something else. There's been a lot more frequency and severity than anything that we've ever seen before. And so, there is the added risk of clotting within your catheter and on the outside of your catheter, which could be associated with both device dysfunction, as well as potentially a DVT.

Dr. Turck:

So, continuing on this track of putting the right vascular devices into play at the right time for the right patients, what kinds of impacts have you seen with triple lumen catheters when used in the right contexts for COVID patients?

Dr. Gilmore:

The approach to the right catheter for the right patient is really the emphasis. And when you need central access, you need to have that access, functional, consistent and deliver your infusions and deliver your medications. And, the right access point, the right number of lumens, the right number of access points, sometimes, those are all careful decisions that have to be made and if you take a customized approach to the patient, then you can deliver just what the patient needs. Not too much and not too little. And hopefully decrease the risk of complications in making those strategic decisions.

Dr. Turck:

For those just tuning in, you're listening to *Vascular Viewpoints* on ReachMD. I'm Dr. Charles Turck, and joining me is Dr. Nathan Gilmore from the Critical Care Services Division of Hoag Hospital in Newport Beach, California. We're talking about special considerations for vascular access in COVID-19 patients.

So, Dr. Gilmore, now that we have a better understanding of impact, I'm interested in capturing lessons learned about vascular device selections throughout the pandemic. What were some surprises for you along the way?

Dr. Gilmore:

Yeah, and that's another important message here is that there are risks to everything and when you increase your volume and increase your complexity, those risks seem to get amplified, too. And globally, nationally, and locally we found increased complications, associated with everything we do, especially when they're that sick. So, with central access, we found complications of central line associated infections. These patients are immune compromised, they've been put on steroids, they've been in the hospital for a long period of time, and so there's been an increased risk of central line-associated infections, globally and we've seen, unfortunately, some of those cases at our institution.

Similarly, like I mentioned before, the risk of clotting, that is increased with these COVID patients, especially these critically ill COVID patients, and so those two areas have required additional levels of scrutiny. And that includes, you know, better management of the risk factors and risk, benefit tradeoffs, as well as, obviously strategic planning, like I mentioned before. And that our goal is really customized care for the patient demand. And if they don't need central access, then don't do it. If they need long-dwelling peripheral IV access, choose that instead. If, they're going to need central access for a really prolonged period of time, use a PICC line, probably, instead of central, jugular or, other central line. And so, with that customized approach, couple with the extra scrutiny, paying closer attention to how we manage and maintain our lines, etc., remove our lines more quickly, that has given us a better balance for the 'just right' for our patients, which can hopefully decrease risk while still delivering exactly what the patient needs when they need it.

Dr. Turck:

Coming back to our focus on multi-lumen catheters for a moment, did you uncover any contexts, specific pros and cons to using triple lumen catheters that other critical care specialists should keep in mind?

Dr. Gilmore:

Absolutely. And I think anybody who's faced this heavy burden of COVID patients for this sustained period of time would hopefully agree with me that when you need central access, you want to try and minimize your access points. And that's to decrease the exposure risk for central line infections and DVT's. And so if you can successfully deliver your medications and infusions and therapies with once central access point and avoid placing another one, then you've decreased your risk of those DVT's and central-line associated infections that much more. And so, having that extra lumen capability is a big advantage, to mitigate that risk.

Dr. Turck:

So, looking ahead, beyond the pandemic, Dr. Gilmore, what do you envision is priority one in vascular access and device selections going forward? Is there anything we can take from this challenging situation, to put critical care services in a better place?

Dr. Gilmore:

Absolutely. You know, it's been a stress. It's been a strain. We've all felt it. We continue to feel it now. And I do feel that there have been some lessons learned that can really apply to all of our critical patients. So, as I described, the 'just right' approach to central access placement, IV access in general, and customizing our approach to the patients IV access needs and not using one-size-fits-all strategies and deciding ok, how long does this access point need to be there? And does it need to be central or peripheral? Taking that customized approach to your patient should be something we can carry over, for all of our patients throughout the hospital, not just COVID.

And of course, the extra scrutiny in maintenance and care and consideration to really decrease the risks and exposure for potential complications like DVT's and central line associated infections. Those are areas that we've already demonstrated that we can really take those lessons and apply them across the board to all high acuity patients and, benefit those patients, as well.

Dr. Turck:

Well, like everyone else, I'm looking forward to the time when we might get to talk about pandemics in the past tense. But for now, I do want to genuinely thank you and your colleagues for everything that you're doing to improve critical care services in such challenging times. It's been great having you on the program, Dr. Gilmore. Thanks so much.

Dr. Gilmore:

Thank you.

Announcer:

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