

Melanie Cole (Host): Welcome to the podcast series from the specialists at Penn Medicine. I'm Melanie Cole, and I invite you to listen as we examine when to refer heart failure patients to Penn Medicine. Joining me is Dr. Joyce Wald. She's the Director, Practice Development, Heart Failure Transplant, and MCS Programs, and the Interim Medical Director of Mechanical Circulatory Support at Penn Medicine. Dr. Wald, it's a pleasure to have you join us today. Can you start by providing an overview for us of the left ventricular assist device or the LVAD program at Penn Medicine?

Joyce Wald, DO, FACC (Guest): Yes, great. Thank you so much for having me. You'll find that we use the terms LVAD, left ventricular assist device and mechanical circulatory support interchangeably. This is a mechanical heart pump that is used for patients who have severe heart failure, that is not treatable with medical therapy. And they undergo a surgery to implant a mechanical heart pump to help their heart function. The heart itself stays in, but the pump will take over the majority of the work so that the patient can go back to normal living, traveling, doing all the things that they wanted to do prior to becoming sick.

Host: So, then let's talk a little what about the indications for LVAD therapy and the difference between bridge therapy and destination? So, we realize Dr. Wald, that many patients listed for transplant, are at some level candidates for mechanical circulatory support. Do you have some compelling factors that might argue for going straight to transplant versus bridge therapy? Explain a little bit about the differences for us.

Dr. Wald: Of course, thank you for that question. Patients who are waiting for heart transplant are typically very ill and are on IV medications to support their heart so that their heart is giving enough blood flow to their kidneys, their liver, their brain. But if those medications stop working and some other potential temporary devices that can be used, and the wait is too long for transplant that a heart may not become available in a short period of time; we may move to put in a left ventricular assist device as a bridge to get them to transplant, when those other therapies are no longer working.

Host: Do you have some outcomes you can talk about, between the difference between patients bridged with LVAD when compared to primary cardiac transplantation? Tell us about what you've seen.

Dr. Wald: So, overall the outcomes are pretty similar.

Host: You recently participated in a study responsible for the Penn Columbia risk score for patients receiving LVAD. Explain a little bit about the study for us and its findings.

Dr. Wald: So, what we would like to understand as providers are when does a patient become too sick for ventricular assist device, and there are many factors that can go into that. Things that go into the risk score include prior open-heart surgeries, kidney function, degree of malnourishment, liver function as well as other medications that they are on. And we know that the healthier a patient goes into any heart surgery, the better that they will do.

Host: So, the LVADS have had some safety issues related to specific populations and intra-operative practices. Can you comment on these Dr. Wald and what we've learned to optimize the safety of these devices?

Dr. Wald: Yes, of course. So, you're alluding to studies with our earlier pump called the HeartMate II, in which cannula position can affect the risk for VAD thrombosis. And we did have a period of time where we saw a lot of VAD thrombosis, but we've since number one, been able to correct some surgical techniques to avoid that from happening. And number two, our pumps have gotten better

that the risk for VAD thrombosis is now almost extinct with our newer generation pumps.

Host: Well, I'm glad that you mentioned that because that segues into this next question. Expand a little bit about those new generation of continuous flow pumps, and they've proven to be a little bit versatile, right? And can effectively support nearly any type of patient for these indications. What's exciting in the LVAD world. Tell us about this.

Dr. Wald: There's many things that are exciting in the LVAD world. One is that with our durable pumps now, that our outcomes at one year are pretty much equivalent to that of heart transplant. So, the outcomes at one year are pretty much equivalent to that of heart transplant with the improved technology of the newer pumps.

Host: Dr. Wald, what's different in the LVAD world? How has it evolved? And what's different in the last few years?

Dr. Wald: That's a great question. There are multiple things that evolved. One, our listing criteria is such that we're getting more patients straight to transplant with temporary mechanical support, and many more of our patients who are getting LVADs are as what we call destination therapy, meaning they are not a candidate for heart transplantation for whatever medical reason and that they can get this lifesaving therapy as what's called destination therapy, meaning not as a bridge to transplant. And these patients live amazing lives. Traveling. We have one patient that was traveling regularly to Egypt. Another one that was traveling to Aruba. So, they really do live a normal life with this therapy as destination.

Host: Isn't that amazing. And as we wrap up, what do you see as the future for mechanical circulatory support and the program at Penn Medicine? And when do you feel that it's important for other providers to refer?

Dr. Wald: So, number one, in the future, we're so excited that our current pumps are getting better and better. So, it's the complications are less. We are also looking to decrease the degree of anticoagulation that's needed since these pumps are clotting less. And so maybe the risk of bleeding will be lower. Also we are doing what's called a lateral thoracotomy approach, which is minimally invasive instead of a major open-heart surgery through a midline sternotomy. They're getting a lateral thoracotomy, minimally invasive placement of these pumps, which hopefully should improve outcomes; less right heart failure, less bleeding, less pain, and a shortened hospital stay.

Also in the future, we're looking at fully implantable pumps so that they don't have an external drive line. And that the power source can be re-energized, transcutaneously. So, transcutaneous power. So, those are some of the exciting things that are happening in the MCS world and at Penn. And really the importance of outcome has to do a lot with timing from our wonderful referrals out in the community. The healthier a patient goes into surgery, the better that they do. So, we like people to start thinking about referring for either heart transplant or VAD if they are starting to have worsening symptoms, shortness of breath at a less duration of activity, they're starting to not tolerate their medical therapy. You've had to pull back on their ACE inhibitor or beta blocker for whatever reason. They were stable on a certain dose of diuretics, but now need higher doses to keep them euvolemic. Or they were stable, then all of a sudden, their ICD went off or they flipped into AFib. So, electrical instability. These are all signs that something is happening in that patient and that we're starting to fail. If we're waiting to the point where they're malnourished or bedridden or just too frail, these patients don't do well with destination therapy or transplant. So, we ask that our community partners think of this therapy because the outcomes are so much improved, to refer them earlier, rather than later.

Host: Such an important point and thank you so much, Dr. Wald for joining us today and telling us about the MCS program at Penn Medicine. To refer your patient to Dr. Wald, please visit our website [@pennmedicine.org/refer](https://www.pennmedicine.org/refer). Or you can call 877-937-PENN. That concludes this episode from the specialists at Penn Medicine. Please remember to subscribe, rate and review this podcast and all the other Penn Medicine podcasts. I'm Melanie Cole.