

Host: Welcome to the podcast series from the specialists at Penn Medicine.

I'm Melanie Cole and here is Dr. Lisa Levine. She's the director of the Pregnancy and Heart Disease Program at Penn Medicine. Before we begin, I'd like to remind our listeners that they can reach the Program directly by calling [215-662-2982](tel:215-662-2982).

Dr. Levine, it's such a pleasure to have you join us today. I'd like you to start by discussing what happens in pregnancy in the postpartum period to make cardiovascular disease a leading cause of maternal death in the United States. What burden does pregnancy place on the heart, for example, and why do some women and birthing people develop heart disease for the first time during pregnancy?

Lisa Levine, MD, MSCE: So, thank you so much for having me, and that really is a great question. There are a number of physiologic changes that happen throughout the entire body during a pregnancy, with the heart actually being on the receiving end of one of the biggest changes that occur. And importantly, all of these changes start as early as the first trimester and continue throughout the pregnancy.

And these changes include things such as an increase in heart rate, a doubling of the amount of blood being pumped through the heart, the heart is also working about 50 percent harder to pump all of that blood with an increase in cardiac output of about 50 percent as well. And so, these changes both unmask underlying heart issues, but can also potentially trigger new ones.

And there are also a number of hormonal changes that occur both in pregnancy as well as after delivery, potentially putting further strain on the heart. And so many of these hormonal changes are thought to be one of the causes of peripartum cardiomyopathy, a condition where the heart stops functioning as it's supposed to be, leading to a decrease in the ejection fraction.

And this can happen during pregnancy or postpartum. And the exact causes of peripartum cardiomyopathy are not completely clear despite it being one of the most dangerous types of heart related complications in pregnancy or the postpartum time period.

Host: Well, what an interesting topic we're discussing here today, and you were an essential piece in establishing the Pregnancy and Heart Disease Program at Penn

Medicine as a part of Maternal Fetal Medicine Division within the Department of OBGYN.

What types of patients do you typically see? What special measures are available from the Pregnancy and Heart Disease Program to care for these patients? Speak a little bit about inclusion into the program itself.

Lisa Levine, MD, MSCE: Sure, so we see all kinds of patients within our pregnancy and heart disease program. We see patients with known heart conditions, so these can be conditions they are born with, such as congenital heart conditions like Tetralogy of Fallot or transposition of the great arteries or bicuspid aortic valve, but also those that develop new heart conditions at some point in their life, such as those with arrhythmias or prior MIs or conditions like SCAD, spontaneous coronary artery dissection, and those with cardiomyopathies.

And so these patients we may see either before they become pregnant, during pregnancy, or postpartum. Sometimes we actually see them throughout all of those time periods. And in addition to seeing patients with known heart conditions, we also see patients that have any new heart issues that come up in pregnancy.

So, I know we just spoke about some of those changes to the heart that can occur in pregnancy and because of that, there are sometimes people that have new arrhythmias or new heart failure or we may even identify someone as being at high risk for heart disease in pregnancy based on their family history or other medical risk factors such as long standing hypertension or diabetes.

And so, we also see those patients within the program as well helping to facilitate additional testing and evaluation if needed or helping to make plans for the remainder of their pregnancy, including the best ways to keep them safe during the pregnancy and the delivery process. This may include things like starting specific medications or getting additional testing done, and on occasion it may even mean an earlier delivery and things like that.

Host: Well, we know that the risks to cardiovascular health extend beyond pregnancy and you've spoken about pregnancy and postnatal. Now tell us briefly about the importance of preconception period, how the program works to engage patients those

few months before. So, if you already know that they are a possible high risk, then what happens?

Lisa Levine, MD, MSCE: That's such a great question because the preconception time period is such a unique opportunity and important time to get patients into care with high-risk pregnancy specialists. So not all reproductive age females need to seek out preconception care prior to getting pregnant. Certainly, anyone with a known chronic medical condition such as lupus or transplant or diabetes could benefit from preconception care, but certainly since this is focusing on heart disease, anyone with a known heart condition should really be seen by a maternal fetal medicine subspecialist prior to getting pregnant to evaluate their overall pregnancy risk.

And during this visit, we not only review the potential risks, and monitoring plans for a pregnancy, but we also spend a bulk of the time ensuring that the person is optimized as best as they can for a pregnancy. And so, this includes reviewing their medication list and reassuring them about the importance of continuing certain medications that are working to keep them safe while also potentially changing some medications that may not, in fact, be safe for pregnancy.

We also often recommend additional testing prior to a pregnancy. For example, an updated echocardiogram if it has been a while since they had one, or a cardiac stress test can often be helpful in patients to see how their heart might respond to the increased demands of pregnancy by mimicking some of that stress of pregnancy with a cardiac stress test.

And another important aspect of preconception consultation is enabling patients to have an informed decision about whether or not they do in fact want to proceed with a pregnancy. While some people are truly at such an incredibly high risk of major complications during pregnancy, including death, the majority of patients really aren't, yet so many people are really scared about this exact thing.

And pregnancy will certainly come with risk, but that does not mean it's absolutely contraindicated in most patients. But it really is important to empower patients to understand the potential risks so that they can make a truly informed decision about whether or not they do or do not want to pursue a future pregnancy.

And certainly, contraceptive counseling also comes up for those that do not want a pregnancy at this time or potentially not at all. One of the last things that we always focus on during these visits is talking about whether or not it's safe for patients if they choose to pursue a future pregnancy.

Should they continue prenatal care with their general OBGYN or do they need to have specialized care during pregnancy with a maternal fetal medicine subspecialist? And then we also talk about whether or not it would be safest for them to deliver at Penn, where we have a tremendous amount of experience caring for the most complicated cardiac patients, or perhaps if they are not at such a high risk of complications, they can safely deliver at a hospital closer to where they live or where they had wanted to deliver.

And certainly, this last part that we just spoke about in terms of who to get your care with and where to deliver is a conversation that we have during a preconception visit, but that also happens when we see patients during pregnancy as well.

Host: Dr. Levine, you're a maternal fetal medicine specialist, and your colleague in leading the Pregnancy and Heart Disease Program is Dr. Jennifer Lewey, a cardiologist. Tell us a little bit about the multidisciplinary aspect of the center. What other types of specialists are involved in the program, and how do you all work together to better ensure maternal health?

Lisa Levine, MD, MSCE: So, our team includes a number of cardiology subspecialists including specialists from electrophysiology, and cardiomyopathy, and congenital heart disease, and pulmonary hypertension. But we also work with our colleagues in pediatrics and the neonatologists, as well as our anesthesia colleagues who really are critical to keeping our patients with heart disease safe during the time of labor and delivery.

And in fact, we have most of our cardiac patients have a consultation with our anesthesia team to ensure a safe plan for things like pain medication during delivery, epidural and things like that.

Host: Finally, Dr. Levine, how would physicians in our community refer women to the Pregnancy and Heart Disease Program at Penn Medicine? What would you like to

tell referring physicians, the key takeaways, what you really want them to know about the program?

Lisa Levine, MD, MSCE: In terms of phone number, the number to reach our program is 215-662-2982. Anyone is welcome to send me an Epic message or email me or call me at any time. And really, I think a few of the biggest take home points are the importance of just even thinking about this for patients that aren't pregnant, this program, and referring them to this program so that before they get pregnant, we have the opportunity talk to them.

And then just really highlighting the fact that together with a multidisciplinary team, we really, can get the best outcomes possible for a lot of our patients and it's a unique program that allows safe pregnancy and delivery for so many of our patients.

Host: It certainly does. And thank you so much for joining us and sharing your incredible expertise and telling us about the program. Thank you again. And to refer your patient to Dr. Levine at Penn Medicine, please call our 24/7 provider only line at 877-937-PENN, or you can submit your referral via our secure online referral form by visiting our website at [pennmedicine.org/refer-your-patient](https://www.pennmedicine.org/refer-your-patient). That concludes this episode from the specialists at Penn Medicine. Please always remember to subscribe, rate, and review this podcast on Apple Podcasts, iHeart, Spotify, and Pandora. I'm Melanie Cole. Thanks so much for joining us today.