

Pre-Pregnancy Risk Assessment for CV Patient

Dr. Malcolm Bell: Welcome listeners and viewers to another in a series of interviews with the experts. I'm Malcolm Bell your studio host today, and I'm joined by my colleague Dr. Katie Young, whom many of you will remember discussion with her quite a few episodes ago on peripartum cardiomyopathy. Katie is here today to talk about a pre-pregnancy risk assessment for the cardiovascular patient. She's an assistant professor of medicine and medical director of our cardiac OB clinic. So Katie, welcome again and somewhat, and thanks so much for, for joining us for this second podcast.

Dr. Katie Young: Absolutely. Happy to be here.

Dr. Malcolm Bell: Yeah. So let's just start off with why we are talking about this. It appears that your maternal mortality rates were twice that in the US compared to other countries. And so how can we work to decrease maternal mortality rates here? And, and as you answer that or think about that, is this, because this is primarily cardiovascular cause of death, and so maybe just a little background here and, and then we'll talk about how we can prevent this.

Dr. Katie Young: Absolutely. No great way to introduce this topic. As we know, the maternal mortality rates in the US remain quite high, and cardiac disease is actually the leading cause of pregnancy related deaths. And between one in 4% of pregnancies in the US will be affected by cardiovascular disease. And we know that there's an increasing population of those with congenital heart disease, living longer and into adulthood and having children. But we also see an increase in, in pregnancies in individuals with acquired heart disease conditions. So that can be aortopathy, cardiomyopathies, coronary disease, and more risk factors, particularly as individuals are having pregnancies later in later in their life as well.

Dr. Malcolm Bell: I mean, it's clearly alarming that our mortality in in this country is so much higher than in so many other countries, and obviously many different reasons for that. And maybe that's a discussion for, for another time. But for today, we're gonna focus on the cardiovascular causes and, and I think you said, you know, it also includes, you know, hypertensive heart disease, you know, preeclampsia, eclampsia. So let's just then just focus on the cardiovascular aspects here and, and maybe just start off with telling our real listeners and viewers, I mean, how can we estimate this cardiovascular and obstetric risk in these patients?

Dr. Katie Young: Yeah, pre preconception counseling is really our, an opportunity, I think for us in cardiology to make an impact on maternal mortality. It's our, it's our opportunity to provide education and risk assessment. And this is gonna depend on many things, including the underlying cardiac condition, the individual's functional status, their comorbidities. And so it's, it's, it's not

always straightforward and it has multiple layers. And really this is best done through a multidisciplinary approach. So here we really like to do pregnancy, our preconception counseling in combination with our obstetric and maternal fetal medicine colleagues so that we're assessing both the maternal cardiovascular and obstetric risk as well as potential fetal risks. And really our goal is to help identify those at highest risk who may benefit from an intervention prior to pregnancy. Those who should be advised against proceeding with pregnancy and otherwise those that maybe were told they were high risk to actually let them know that actually we think you can have a safe pregnancy and this is your plan. And there are a few tools that we can, we have available to help us estimate those risks prior to car preg. So CAR Preg is probably the initial risk assessment strategy that was published in 2001. Prior to that, there actually wasn't a lot of guidance in this area. And since then we've had the Sahara Registry, there's been the PAC Registry and then Car Preg two as well, which was in 2018

Dr. Malcolm Bell: Currently. So can you, sorry to, to interrupt you. So, you know, as cardiologists, we love these risk scores, don't we? And so you, you mentioned, you know, two or three there, so just wanna make sure everyone heard that correctly. So it's the car preg I mean, could you just maybe spell that out because I'm sure the viewers were googling this, you know, straightaway.

Dr. Katie Young: Yeah, so CAR preg, so C-A-R-P-R-E-G two in 2018. Now that's a risk index score, which includes a few clinical and echo parameters, and it identifies 10 predictors on a weighted scale. And so you develop a score, although I would say what we use most commonly is the, what's called the modified who risk classification. So World Health Organization risk Stratification, and I would say this is probably the preferred and felt to be the most accurate tool for risk assessment and how the modified WHO or modified to risk classification works is you classify the individual based on the underlying cardiac condition. So if you, a, a good table of this is available in the ESC 2018 guidelines, pregnancy and heart disease guidelines. But for example, class, there's a class one through class four, class one will be your lower risk patients. So that's someone with someone with a repaired simple congenital heart defect like an ASD or VSD, someone with a simple arrhythmia such as some PVCs or an SVT. And the, then it goes based on category. So intermediate risk is, this is modified who class two to three so that someone with, for instance, hypertrophic cardiomyopathy, and then our higher risk lesions are modified who risk class three and then four. And so those are individuals felt to be at highest risk. And what's great about the World Health Organization classification is within their classification provides recommendations on how often to follow individuals through pregnancy and guidance on where these patients should deliver. Are these, you know, is this individual safe to deliver locally or do we need to look at them coming to a, a higher level of care? It's very confident

Dr. Malcolm Bell: Further. So this, so this risk score, it comes out as a numerical score or is it a categorical score? And, and if so, you know, if it is a numerical score, is there a cutoff in which you, you're gonna consider this person to be at low risk? And, and again, I'm, I'm thinking of the scores that we're all used to using for other cardiac conditions and other disease states.

Dr. Katie Young: Yep. So what's great about the mod, the modified WHO is it's a categorical risk score. So you get placed, the individual gets placed into a category based on their underlying condition, and based on that they, it provides an estimate, low, intermediate and high of maternal cardiovascular and obstetric risk.

Dr. Malcolm Bell: Okay. And then, you know, as you said, you know, one to 4% of pregnancies, you know, may be considered to be at, you know, at high risk in, in terms of the predictive value or accuracy of these risk scores. I mean, where do they fit? Is it is, are they very robust or modest? You know, when you apply this to a, a large population?

Dr. Katie Young: Yeah. And, and I would say the modified WH is felt to be the most accurate and it does have some prospective validation to it, which is, and that's the risk classification score that I use and that we use in our cardio obstetric clinic. Most commonly we also,

Dr. Malcolm Bell: Okay, so you've got those, those categories which you just described, in which ones of those are you gonna counsel against pursuing pregnancy from the outset? You know, so preconception.

Dr. Katie Young: Yeah. So this is an important topic and this is really where I think, again, we can make an impact. And so in thinking about it, you can think of your risk classification, WHO class four patients. Those are the highest risk patients. Those are the cardiac lesions which we feel are not likely to tolerate the hemodynamic and physiologic changes of pregnancy very well. And so this, you

Dr. Malcolm Bell: Give maybe three or four examples of, of that. Yeah.

Dr. Katie Young: Yep. So those would be patients with pulmonary arterial hypertension, severe LV dysfunction or symptomatic heart failure, previous peripartum cardiomyopathy with unre residual LV dysfunction. And then the other two big ones to remember are the obstructive valve lesion, so mitral stenosis, symptomatic aortic valve stenosis, and then aortopathy. So these have various cutoffs depending on the underlying cause of the dilated aorta, but marfan patients, bicuspid aortic valve patients with aortopathy, they have various cutoffs. And depending on that, we would rec advise against a pregnancy if a individual has those things.

Dr. Malcolm Bell: Right. I know you mentioned mitral stenosis and aortic stenosis of as obstructive lesion. Presumably though you could take a step back and then think about, well, maybe we could fix this.

Dr. Katie Young: Absolutely.

Dr. Malcolm Bell: Relieve the obstruction and then, you know, come back later with an assessment for suitability or safety pregnancy. Yeah,

Dr. Katie Young: Absolutely. And that's, that's, and this is the opportunity to do that. And if the individual really wants to proceed with pregnancy, knowing that sometimes will influence us moving forward with that intervention to allow them to have a safer pregnancy.

Dr. Malcolm Bell: Are there any disease states, Katie, that in the past that we thought were unsafe you to consider pregnancy that now today, you know, with, you know, improved medical therapy, we, we already talked about your valvular interventions. Yeah. That now it would not be, so we, we may not be so definite in a advising against pregnancy.

Dr. Katie Young: Yeah, I think I, I can't think of a particular lesion or underlying condition that's maybe changed in the past several years, but certainly I think our knowledge surrounding how to best care for these individuals and knowing how to restratify them and who's at higher risk has definitely improved in the past several years. Absolutely.

Dr. Malcolm Bell: Just in the last few minutes here, what, I mean, obviously, you know, we have electrocardiograms and echocardiograms things, but what other testing would you consider to be really important as you're assessing these patients Preconception?

Dr. Katie Young: So, absolutely, so baseline, ECG echo, we love that in cardiology, but a few other important parts of preconception counseling. We use exercise testing quite a bit. So anyone with congenital or structural heart disease, we use that assessment of their functional capacity. And in general, achieving greater than 80% predicted is associated with favorable pregnancy outcomes. So it's a, it's a, it's a test of their symptoms. So we also look for arrhythmias, blood pressure changes, symptoms, but also their overall functional capacity. So

Dr. Malcolm Bell: Actually can you do that with the oxygen consumption and imaging, or is it just, is plain treadmill testing sufficient then

Dr. Katie Young: I usually do pair it with VO two. I don't commonly put it with imaging. It's usually, but a VO two component to it is very helpful. Okay. So, but even just a plain treadmill exercise test would be sufficient as well, if that's what's available. Okay. And then a couple other things, again, for the aortopathy patients, baseline cross-sectional imaging is becomes very important as well. And I often obtain baseline biomarkers like NT-proBNP for my patients with cardiomyopathy or valve disease as well to follow through their pregnancy.

Dr. Malcolm Bell: Are, are there baseline NT-proBNP measurements that would really allow you,

Dr. Katie Young: It's more really in pregnancy. So an someone who's other, you know, healthy through pregnancy, NT-proBNP should remain normal. So an abnormal NT-proBNP would raise alarm and should raise alarm for investigating for cardiac concerns or cardiac contributors to their symptoms. So in someone with preexisting disease, I think having a baseline value to know where they are, many of them it will still be normal, but if it's a little abnormal, then you at least know where they're starting to follow through their pregnancy.

Dr. Malcolm Bell: Any other testing that you want to inform us about?

Dr. Katie Young: The only other important components I think to highlight are genetics is very important as well. So a lot of these individuals may have autosomal dominant or, you know, genetic conditions such as marfan or hypertrophic cardiomyopathy. So having them meet with the genetics team to receive counseling for their offspring is extremely important. And all individuals with congenital heart disease that become pregnant should be counseled that their babies are also at increased risk of congenital heart disease. So that is part of our counseling and they should receive that. And then we can't forget medications. This is, we also need to review medication lists to make sure things don't need to be modified, looking for those that are safe or not safe to continue through a pregnancy.

Dr. Malcolm Bell: Katie, this, this has been really tremendous. Our, our time is up here as always, so you just are able to explain this in very clear detail. I think our listeners and viewers have really gained a lot of knowledge here. This is a very specialized area and one obviously is very, very important for, for families and particularly the mother. And so really appreciate you coming back to join us and I look forward to further opportunities to have you, you know, share your wisdom and experience.

Dr. Katie Young: Absolutely. Happy to be here. Thank you very much.