

English Transcript

Interview with Dr. Jonathan Uniat

Dr. Eyal Ben-Isaac:

Hello and welcome to the Perspectives on Pediatrics podcast. I'm your host, Dr Eyal Ben Isaac, recording from Children's Hospital Los Angeles. I have the pleasure of speaking with Dr. Jonathan Uniat, who is an attending physician, cardiologist and electrophysiologist in the Division of Cardiology at Children's Hospital Los Angeles, and an Assistant Professor of Pediatrics at the Keck School of Medicine at USC. Today's topic we'll be discussing innocent heart murmurs. Welcome Jonathan.

Dr. Jonathan Uniat:

Thank you for having me.

Dr. Eyal Ben-Isaac:

Innocent. Heart murmur seems to be such an important topic, because it seems like, as a clinician in general pediatrics, it comes up on a regular basis, probably almost every day, we might hear something and we wonder, should we say something? Should we not say something? Do we know what we're talking about? Is it innocent? Is it not? So maybe we can go over what is the definition or meaning of an innocent heart murmur, or is there a better term to use?

Dr. Jonathan Uniat:

Yeah, great questions, and they come up every day like you had mentioned. The definition of an innocent heart murmur is a murmur that is not associated with any cardiac pathology or any heart defects. Other terms that people like to use, including myself, include a functional murmur, benign murmur, or even just saying there's a normal extra heart sound. And I tend to lean on the normal extra heart sound with families and say normal as many times as possible to emphasize that this is expected and is normal for their child. From a medical perspective, characteristics of an innocent heart murmur that is usually midsystolic, faint, either musical or blowing in quality.

Dr. Eyal Ben-Isaac:

I think that's a great suggestion of saying normal over and over again, because I am sure once we start saying something, and I've seen this, that parents probably don't listen to anything else we say, because they're starting to think about bad things about the child's heart. So I think that brings up a conversation that we all have in-clinic sometimes. Do you even bring up the normal or innocent or benign heart murmur when you hear it on exam and do you bring it up to the families? And what are the pros and cons for bringing it up?

Dr. Jonathan Uniat:

Yeah, I have the luxury of being from the subspecialty perspective, where, if I am hearing it, someone's either heard it before. But I do get, occasionally, families that no one's ever told them that they've had a heart murmur. And so I always bring it up with families, because invariably, someone will hear it, whether they go to an

urgent care or an emergency room or even seeing one of your partners that is filling in for you. And they will, someone will mention it to the family. And I bring it up in a way that tries to reassure their family, again, that it is a normal finding, and say, normal five to 10 times during the visit, and things that the reason why I believe it's important to bring up is to give the family a sense that they know what is going on with their child, and again, that they can be reassured that this is okay and that it is a normal finding. I also try to arm them with the information that characteristics of when it may be heard more like you know when that when they're sick, it may be louder. And so if you're in an urgent care while sick, and the provider brings up, "hey, did you know your child had a heart murmurs", like, "yes, my doctor had told me about this. They told me, like, it's louder when they're sick", and just to give them more information, which I think is helpful for them.

Dr. Eyal Ben-Isaac:

Yeah, I think that last point is wonderful, because I think over the years, that's what I've really emphasized to the families when they do hear, because I know if they do go to an urgent care because the kid is febrile or so on, and then the provider says something, or the urgent care provider says something to them, then they freak out because they never heard it before. So I always like to warn them, and I think I've done that on a regular basis now, just because of that specific reason. So thank you for bringing that up. Maybe if we can go through the individual names, because there are many different benign heart murmurs that we have been taught in med school and residency and so on, and the characteristics, the age groups, the names of them, why they are called that, and what are some of the characteristics of each

one? That would be wonderful. It's a lot of information, but if Yeah, you can go through that, that would be wonderful.

Dr. Jonathan Uniat:

Of course, I think the first category that I like to think about is something that's called a Still's murmur, which is typically caused by blood flow going over the mitral valve chordae during systole that gives off a musical or vibratory sound. The typical age group that we see this in is people or children, ages three up until their adolescence. But it can be present at a younger age, including, like four or six months of age. This murmur is best heard over the left lower sternal border and occasionally at the cardiac apex. And the murmur that is produced is a low pitched, vibratory, musical sound, which gets louder when the patient lays down or is supine. The main things that I listen for to help distinguish it from pathologic murmurs are the pitch, with low pitch more likely to be benign during systole, midsystolic compared to holosystolic murmurs, and if the murmur gets louder when laying down, and that's an important distinction as well as this murmur should decrease with valsalva maneuvers. The second category that I think about are individuals that present with a more continuous murmur, such as a venous hum. So remember that most continuous murmurs are pathologic. We think about patent ductus arteriosus, but this one is an exception. It's a result of more rapid venous drainage from the subclavian veins into the SVC in the right atrium. And this murmur can be present at any age, but is more commonly seen in school aged children to teenagers, and it's typically heard at the right infraclavicular area and sometimes at the right upper sternal border. Again, it is a low pitched, continuous

murmur that softens with laying down or turning of the head, as this is very sensitive to changes in venous return to the heart. In order to help distinguish this murmur from a pathologic murmur such as a patent ductus arteriosus, listening to it in different positions is helpful, as turning the head or become supine, should decrease the sound of a venous hum, or as a PDA, it should not affect it. And again, listening to the quality so a low pitched, continuous murmur is more likely to be a venous hum compared to a PDA.

Dr. Eyal Ben-Isaac:

Before you go on to the next one, I was wondering if maybe because you mentioned, first with Still's murmur, it is not holosystolic, and in the second you mentioned, it's typically a continuous murmur. With holosystolic sounds like usually that is a pathological murmur. And do you hear s1 and s2 in a holosystolic and how about in a continuous murmur?

Dr. Jonathan Uniat:

It's a good question. So for holosystolic murmurs, you typically can hear s1 and s2 but another term that people have used for holosystolic murmurs is a coincident s1 murmur, meaning that the murmur sound starts as soon as you hear s1 and continues all the way to s2. Sometimes it is hard to hear s2 but typically those can be distinct, and you brought up a good point. So for continuous murmurs, typically people think you know you can hear s1 and hearing s2 can be more challenging in practice, I would say it is not unusual to hear s2 in a continuous murmur, but sometimes you hear continuation of the murmur itself beyond s2 and that's just

because with s2 which is closure of the aortic and pulmonic valves, the pulmonic valve is quite anterior in the chest, so it is actually easier to hear s2. And so those are the kind of additional tidbits of information I would give.

Dr. Eyal Ben-Isaac:

Wonderful. Thank you. Sorry for interrupting. Keep going with the other one.

Dr. Jonathan Uniat:

The third category that I think about is a pulmonary flow murmur. So there are two age groups that I think about this. So one in our younger patients, peripheral pulmonic stenosis, and then two, in our older patients, when they're more developed, is a pulmonic flow murmur. So first talking about peripheral pulmonic stenosis, which is a misnomer, there's nothing wrong with the pulmonary arteries. It has to do more with the orientation and the growth of the pulmonary arteries starting at a young age. So when infants are developing in utero, the main pulmonary artery is of normal size, and the branch pulmonary arteries are continuing to develop in an early infancy, are not quite as developed as the main pulmonary artery. Because of this, there's a relative stenosis or relative narrowing that can produce flow turbulence when blood courses through them. As the infant gets older, the branch pulmonary arteries continue to grow, and this sound decreases over time. So when talking about a normal age range where I would expect to hear this, you can hear this in newborns up until about age six months, and it should be gone by then. If it continues beyond that, you should think about, is there actually branch pulmonary artery stenosis and should this be looked into

further? When listening to this murmur, you will typically hear a midsystolic murmur at the left upper sternal mortar with radiation into the axilla, thinking about where the pulmonary arteries go and sometimes the back as well. To distinguish this from actual pulmonic stenosis, there should be absence of an ejection click. Usually, when thinking about some type of semilunar valve stenosis, you hear the valve or semilunar valve pathology, you hear the valve popping itself open with an ejection click. So if you hear an ejection click associated with a murmur, it's more likely to represent some type of pathology. The second group of patients with pulmonary flow murmurs are usually healthy kids. This flow murmur, because the pulmonary artery is the most anterior structure in the heart and the most interior valve, is easy to hear in times of increased flow state. So when there's fever, when they're dehydrated and their heart's pumping harder, those things can augment the sound of just normal blood flow across the pulmonary valve and can be easily heard. So these are the types of murmurs that come up when patients are in urgent cares or emergency rooms because their heart rate's going fast, or they have fever, and it's quickly picked up. But this is a very normal sounding, it's a benign murmur that, again, I would listen for, is there an ejection click? There shouldn't be. And listening to, is it a midsystolic murmur?. And those are important characteristics. The last thing I will say is something else to pay attention to when you're hearing what you hopefully suspect is a pulmonic flow murmur. Is what s2 the secondary heart sound sounds like. We know that s2 with normal hearts should have normal respiratory variation, but if there appears to be fixed splitting of s2, it's more indicative of a fixed flow state, indicative of an atrial septal defect, which obviously represents cardiac pathology.

Dr. Eyal Ben-Isaac:

Is that pulmonic flow murmur, the second one you were mentioning occur at an older age, like eight to 14 years of age or so, or is that a different murmur that occurs at that age group?

Dr. Jonathan Uniat:

I would say it most commonly occurs in the ages that you mentioned, but can be heard younger and older. So it's relatively common to hear, and I would keep it on your differential when you're hearing these extra murmurs.

Dr. Eyal Ben-Isaac:

Wonderful, because I think, Yeah, that happens a lot. As teenagers come in, somebody hears something, and they go, "Oh my god, I never heard this before". And then they worry that something new or something, but it's often just as you said, a benign murmur at the older age group.

Dr. Jonathan Uniat:

Exactly, completely agree. The last category I like to think about are systemic flow murmurs as this represents the last category of innocent heart murmurs in children. These are typically more harsh sounding and high pitched murmurs. And just to note like those are things that I worry about typically when I hear other heart murmurs. But these can actually be benign as well. These murmurs are heard more in the supraclavicular area and have extension into the carotid vessels and represent just rapid blood flow through the aorta into the carotid vessels

themselves. The age range can be quite varied, but is more typically heard in school aged children. Again, this murmur is best heard in the supraclavicular area with some radiation into the carotids. But you know, whenever I hear any type of murmur in the aorta or in the carotids, I have to think about, is there some type of aortic valve pathology? So I pay special attention to the right upper sternal border, where we typically hear aortic valve problems. I listen for an ejection click, which could represent a bicuspid aortic valve, or some type of other aortic stenosis. And listen, is the murmur actually louder at where the aortic valve is? Because if it is louder there than in the supraclavicular region, you have to be concerned for some type of underlying cardiac pathology. And again, if you have any concern about that, this is something that I would consider to be more significant as well, and would try to refer to a specialist if you're able to to get an additional person to listen to and help make that assessment.

Dr. Eyal Ben-Isaac:

Wonderful. Thank you for that great review of all the different, benign, innocent, or, more importantly, normal heart murmurs. As a clinician, and I know this might be a difficult question, and it probably depends also on what services you have available. But what are the things as a clinician, as a general clinician, we should think about in terms of, should we screen? Should we not screen? What do we screen with? Or should we just refer to a cardiologist?

Dr. Jonathan Uniat:

It's a very good question. A lot of it comes down to what your comfort level is in listening to the heart murmur. I would say the things that I look for in when listening are, usually, are, what are the characteristics of the murmur? Do they fall into one of these four categories that I mentioned? Or, and then looking at the rest of the patient, is there any concerns for some underlying genetic syndrome which could predispose them to cardiac pathology? Are they growing appropriately? Are they developing appropriately? And taking into other accounts of what else is going on with the patient. When I'm thinking about screening, if there's any questions, something that is pretty readily available to help screen is an EKG getting a lot of information from the EKG, if there's signs of atrial enlargement, ventricular hypertrophy, is there signs of strain on the EKG, that can help point you towards is this a pathologic murmur or not? That's also helpful. I also would highly consider getting four-extremity blood pressures. You know, sometimes a coarctation can be a little bit hard to discern. That will quickly tell you if there's a coarctation or not. In younger patients, I typically will get a pre and postductal saturation, so getting saturations in the right upper extremity and then comparing it to the lower extremity, just to assure that there's not critical cardiac disease that you're missing.

Dr. Eyal Ben-Isaac:

Wonderful. Those are really helpful tidbits, and I think we can pretty much do most of those in our office setting so wonderful. Thank you so much, Jonathan for that great review. It's again, something that comes up on a regular basis in clinic, and I love the tidbits you gave us, and I love stressing the fact to the families that it's normal, so that they will pay attention to everything else we talk about that day and

not only concentrate about the heart once we mention that so thank you very much for that.

Dr. Jonathan Uniat:

Thank you so much for having me. It was a pleasure to be here.