

Emily Kumler: I'm Emily Kumler and this is Empowered Health.

Kristin O'Meara: I'm a pretty active woman. I've been a long distance runner for many years, many marathons, and many, many half marathons. That morning in January I went to the gym like I usually do and was running the track. Prior to running the track, I was warming up on the treadmill, just kind of get the blood circulating, and I felt this very strange, odd sort of tearing sensation across the middle of my back. But you know, being 56 there's lots of aches and pains that you start to get as you age. And so I just kind of blew it off as another weird ache and pain and it went away. Then, I got on the track and started running and after about 40 minutes of running, I started to experience chest pressure under the sternum, went around into my back. I just thought, this is really weird and I kept running. After a few more minutes, I decided I'd probably better stop and walk and see if I can get rid of it. So, I walked the track for awhile and in the back of my mind, I thought to myself, I think this is what [angina](#)¹ feels like, this pressure under the sternum. But I just kept thinking there is no way that I can be experiencing angina because I'm pretty active. I have no issues with cholesterol. I'm healthy. Then I started thinking to myself, I wonder if this is [gallbladder](#)² or I've heard of people having [esophageal spasm](#)³s that can sound like angina. I did leave the gym. You know, I sat down several times, tried to take a shower in the locker room, became nauseous, and that's when it really kicked in that I think this might be cardiac, but it still took me awhile.

Emily Kumler: That was Kristin O'Meara, who is a cardiac nurse at the [Mayo Clinic](#)⁴ in Rochester, Minnesota, and she's now in her late fifties. I'm really struck, and I hope you all heard this too, how she is really trying to not just figure out what this is, but come up with a diagnosis for something that is less serious than a heart attack. Keep in mind, as we listen to the rest of her story, that she is a cardiac nurse, right? So she's somebody who deals with heart patients all the time and she is trying to convince herself that this must be a gallbladder issue even though she's never had issues with her gallbladder before because that's probably less scary. And one of the reasons that I'm harping on this point is because I feel like so often women are disregarded when they go into their doctors or the emergency rooms and their symptoms are dismissed. But we also do that to ourselves. I'm going to go back to Kristin and we're going to figure out what's going on with her.

Kristin O'Meara: I left the gym, drove past the emergency room at St Mary's Hospital. It was a very cold winter day. I drove through the parking lot in the ER and the sign said lot full, no parking and I thought, I don't want to walk two blocks in this cold. So I just kept driving, did a couple of errands. In the meantime I had called my husband at work. He was in a meeting, so he didn't answer. My husband is a nurse also. He called me back. I said, you know, I'm having this weird chest pain and he said, you need to come back to the emergency room right now. And I said, I think if I go home and just lie down for awhile, I honestly think this is my gallbladder. So maybe you know, if I can just lie down and rest for awhile, it'll go away. Again,

¹ <https://www.mayoclinic.org/diseases-conditions/angina/symptoms-causes/syc-20369373>

² <https://www.mayoclinic.org/diseases-conditions/cholecystitis/symptoms-causes/syc-20364867>

³ <https://www.mayoclinic.org/diseases-conditions/esophageal-spasms/symptoms-causes/syc-20372250>

⁴ <https://www.mayoclinic.org/patient-visitor-guide/minnesota>

denial, that's the whole other facet to this is in the back of my mind when it was happening, I kept thinking to myself, I do not want to go to the emergency room and have them tell me I'm having a panic attack or that this is all in your mind. I mean, that played into it as well. I went home and decided to cover all my bases, to take some aspirin and take some tums in case the indigestion was related to, you know, gallbladder. And then within five minutes I threw it all up. And that's when I thought, okay, something is not right. And so I called my husband. I told him I want to, I need to, go to the emergency room. He said, call an ambulance. I said, I'm not calling an ambulance. Come get me. Again, very stupid. But, he came home and got me and took me to the ER. And I am so blessed to be a part of the Mayo Clinic and as soon as I told my story to the physician he said I think you might be having a [spontaneous coronary artery dissection](#)⁵.

Emily Kumler: We're going to spend this whole episode talking about [SCAD](#)⁶, which is spontaneous coronary artery dissection. As you just heard, it's something that even cardiac nurses aren't really that familiar with and [we know that 90% of SCAD patients are female](#).⁷ And so it's sort of interesting because we're learning more and more about this condition and yet it seems like there aren't really accurate figures on how many people have had a SCAD episode. It's still considered to be fairly rare, but I think it's important to emphasize that we don't have any good numbers on this because it's something that's relatively new. And, it does seem like there are some other sort of associations that go along with it, including sort of [extreme emotional or physical stress in the days leading up to a SCAD](#),⁹ and that can be things like death in the family or with somebody that they're close to. Also, marriage issues, job stress, those have all been reported as a common occurrence that happens before SCAD. You're pretty unlikely to die from this, which I think is really important to mention up front, but you are more likely to have this happen again if you've had one. And it's important to also understand that with SCAD the standard heart attack treatments aren't usually very helpful. In some cases, like stents, can make it much worse. We felt strongly that this was the kind of issue when we're looking at heart disease, it's really important for women to know about, since women are so disproportionately represented in SCAD patients. So, there are some associations with all of this, but like with anything else that we talk about, I caution that this really is an area that needs more research. Next, we're going to go to a doctor at Mass General Hospital here in Boston. Dr. Wood is an expert on SCAD.

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<https://www.mayoclinic.org/diseases-conditions/spontaneous-coronary-artery-dissection/symptoms-cause/s/syc-20353711>

6

<https://www.mayoclinic.org/diseases-conditions/spontaneous-coronary-artery-dissection/care-at-mayo-clinic/mac-20353719>

⁷ <https://www.ncbi.nlm.nih.gov/pubmed/23266235>

⁸ <https://www.ncbi.nlm.nih.gov/pubmed/25406203>

⁹ <https://www.ncbi.nlm.nih.gov/pubmed/28838364>

Dr. Wood: So, I'm [Malissa Wood](#)¹⁰ and I am a cardiologist at [Massachusetts General Hospital](#)¹¹. I co-direct the [Corrigan Women's Heart Health Program](#)¹² and I am also currently the governor of the [Massachusetts Chapter of the American College of Cardiology](#)¹³.

Emily Kumler: One of the things that I know you're an expert in is SCAD, which is something that I wasn't really very well versed in it all until the [New York Times wrote about it fairly recently](#)¹⁴. Can you just explain to us a little bit about what it is and why it's impacting women so much more than men? Which may be the million dollar question.

Dr. Wood: Right, so, SCAD or spontaneous coronary artery dissection is a condition that affects what are typically very normal heart arteries. It is typically either a separation of the wall, if you think of the wall as a blood vessel, it's kind of like a sandwich, it's kind of three layers. In different settings, that internal layer can get peeled off or can tear. Also, the middle part of that sandwich, the muscle section of the heart artery, can become damaged and that can cause swelling and that compresses blood flow so either the tearing or the swelling can cause the blood flow to be jeopardized. These [dissections](#)¹⁵ are linked based on the limited available knowledge that we have from studies where we can identify patients who've had this and ask them a lot of questions and review their records. It does seem to have a strong link to pregnancy. It's very rare. It's a very rare occurrence for it to affect pregnancy, but it's the most common cause of heart attack in pregnancy. It's also associated with emotional stress such as sudden onset of, you know, something very stressful or people who have long standing anxiety. Additionally, it can be linked to something called [fibromuscular dysplasia](#)¹⁶, which is a blood vessel condition in healthy women that can cause high blood pressure. And that's where the blood vessels are a little bit too thick in certain parts of the wall of the blood vessel. Additionally, it can happen in people, very rarely, that have connective tissue disorders that are genetic, something called [Ehlers-Danlos](#)¹⁷ or something called [Marfan](#)¹⁸ or [Loeys-Dietz](#)¹⁹ because it causes the blood vessels to be very fragile. And then oftentimes there's an additional component of sort of a surge of adrenaline related to physical activity. So it seems that it's often where there's this overlap of multiple risk factors, either hormones such as pregnancy, or you know, taking birth control pills or taking hormone replacement therapy and then you throw in a history of migraine headaches or anxiety and then you throw in some additional emotional or physical stress. And that kind of intersection of events is just very common. When you ask people about their life at the time of their onset of their SCAD, [the average age is usually about](#)

¹⁰ <https://www.massgeneral.org/doctors/doctor.aspx?id=17377>

¹¹ <https://www.massgeneral.org/default.aspx>

¹² <https://www.massgeneral.org/heartcenter/services/treatmentprograms.aspx?id=1011>

¹³ <http://mcacc.org/>

¹⁴ <https://www.nytimes.com/2019/02/01/well/live/doctors-women-heart-attacks-scad.html>

¹⁵ <https://www.mayoclinic.org/diseases-conditions/aortic-dissection/symptoms-causes/syc-20369496>

¹⁶

<https://www.mayoclinic.org/diseases-conditions/fibromuscular-dysplasia/symptoms-causes/syc-20352144>

¹⁷

<https://www.mayoclinic.org/diseases-conditions/ehlers-danlos-syndrome/symptoms-causes/syc-20362125>

¹⁸ <https://www.mayoclinic.org/diseases-conditions/marfan-syndrome/symptoms-causes/syc-20350782>

¹⁹ <https://ghr.nlm.nih.gov/condition/loeys-dietz-syndrome>

43²⁰ and it's about 90% of the cases occur in women. And these are again, usually pretty healthy women. But we have seen some little, very interesting factors that do relate to that pregnancy theme. Women who have had multiple children, or over four pregnancies, do seem to have a higher risk of getting this. You know, women who really don't have a lot of risk factors do end up with this. So, we're really trying to identify both genetically as well as, you know, just physically based on data, you know, clinical data, why we're seeing this. And we're seeing it much more frequently now because number one, women recognize symptoms of heart attacks better. And number two, doctors recognize that young healthy people can have heart disease. And so they're testing with blood tests like [Troponin](#)²¹, which is an enzyme leaked by the heart in the setting of a heart attack. So, I think better recognition on the part of the patient as well as the care providers is leading to higher, you know, more frequent identification of things like SCAD.

Emily Kumler: And this is happening in the major arteries of the heart, not the smaller sort of vessels around the heart, right?

Dr. Wood: Right. Absolutely. It's happening in the large blood vessels and most commonly it's in the LAD artery, the [left anterior descending](#)²², the one that runs down the front of the heart. That vessel does a lot of the work, it's the workhorse of the heart. It's the most common one involved. You know, sometimes these SCADs are a little bit subtle and that's one of the things we've been trying to do is to teach doctors to recognize it because a lot of times it looks very smooth and so it was previously often thought to be either some spasm of the artery or maybe just normal small arteries. And now we recognize in the setting in which it's occurring that it in fact is related to some injury to the blood vessel.

Emily Kumler: So, the most common presentation of SCAD is just the traditional chest pressure, chest discomfort?

Dr. Wood: When I'm saying the symptoms of SCAD, I really want to make a point that women can have unusual symptoms, but so can men and so can the elderly. Anybody over the age of 70 is more likely to have unusual symptoms. So, I really want this to kind of be an education point for all people because anybody can have atypical symptoms. Much more common to present with typical symptoms with SCAD, so sudden onset of pressure in the chest, but the atypical symptoms that can occur include neck discomfort, jaw discomfort, back discomfort, extreme shortness of breath, weakness. You know, obviously all of us have had neck, back, jaw discomfort at some point in our life. But really the differentiator, I've gleaned this from asking thousands of patients about that experience with their first heart attack, it is something that feels very different than what you've ever felt before.

Emily Kumler: You mean it's not a chronic condition, basically?

²⁰ <https://www.ahajournals.org/doi/full/10.1161/CIR.000000000000564> * Studies have shown average age ranging from 43 to 53, more research needed.

²¹ <https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=167&contentid=troponin>

²² <https://my.clevelandclinic.org/health/articles/17063-coronary-arteries>

Dr. Wood: It's not a chronic condition that comes on. It's getting worse; it's spreading. Oftentimes the pressure in the chest will then spread to the jaw, the neck, or the arm. It doesn't get better with position. It doesn't get better with burping. These are the types of discomforts that you should call 911 if you're experiencing. And, you know, unfortunately the stories abound of people Googling chest pain and having a heart attack and passing out in front of their computer. So I think that if it's enough to make you want to Google it, call 911 because there is absolutely no reason to be embarrassed about going to the emergency room and having them tell you there's nothing wrong with your heart. There is something quite devastating, however, to not, you know, make it through a first heart attack that could have been easily treated. To answer the question that you asked a minute ago, a couple of minutes ago, about whether their hearts are more sensitive, in fact, they do appear to be because women are more likely to die with their first heart attack than are men. Because women are more likely to have isolated disease in one blood vessel and men perhaps have more extensive disease. And so the heart muscle is a little bit more used to having been exposed to not getting enough blood flow. And particularly when a SCAD occurs, the heart has been used to having absolutely normal blood flow and all of a sudden even a small branch vessel, if affected, can lead to a bad rhythm problem occurring. And that's why we tell our patients if you're young, fit, and healthy and something comes on that feels wrong, call 911.

Emily Kumler: That's great. And I think it's also probably important to mention that even though we have said this is like the [leading cause of heart attacks in women who are under 50](#)²³, it is still rare to have this happen. What is the absolute number of cases of SCAD?

Dr. Wood: The numbers are completely unknown because we know that this is grossly underdiagnosed. It probably comes in and out of our emergency room much more frequently than we see.

Emily Kumler: Because of the diagnostic tools that are used?

Dr. Wood: Because of the population that has it. So five years ago, if you were 43 and you were a triathlete and you weighed 110 pounds and you had palpitations and chest pain, you were probably more likely to be told that you were having an anxiety attack, than you were a heart attack. And they wouldn't probably necessarily have even done an [EKG](#)²⁴ or a blood test. And we know this from talking to women who've had SCAD and asking them about their experience. Today, however, because of education, you are likely to get a Troponin test and an EKG to determine whether or not you're fine or there could be something going on. You're absolutely right that this is still very, very, very rare for the overall population. But, you know, when I first started taking care of SCAD patients 12 or 14 years ago, there were like maybe 200 or 300 cases published. Mass General now has seen well over 250 patients in the past five years. So, and then if you add all the other large registries, we're talking into the, you know, 5,000 to 10,000 identified cases that have been published. And so clearly many, many

²³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4060337/>

²⁴ <https://www.mayoclinic.org/tests-procedures/ekg/about/pac-20384983>

places don't even write up their cases because it's really not considered to be a rare condition anymore.

Emily Kumler: That's interesting.

Dr. Wood: For instance, there were like two people in the hospital right now who have it, you know, I have like four on my clinic schedule for Thursday, so this is definitely not something that's rare. It was just kind of rarely diagnosed in the past.

Emily Kumler: It is deadly? I mean, it's not always deadly?

Dr. Wood: Yeah. Well I really want to make the point that it's almost never deadly. It's very rare for people to die from this. The [highest risk people are the women who've just had a baby or the people who have some other type of connective tissue disorder](#).²⁵ They have the highest risk of events. In our series, 12% of patients had presented with or during their presentation they had a cardiac arrest and that, you know, that's out of a hundred and some patients that we wrote up at that time, 12%. And that's pretty consistent with what we've seen across the board. And the majority of those cardiac arrests occurred in an ambulance, in the emergency room, or on the way to like the [cath lab](#)²⁶ to get a diagnostic coronary [angiogram](#)²⁷. So that is my point of don't stay home and wonder if it's going to get better. Call 911. Even in cases that the women had a cardiac arrest, you know, their symptoms weren't that bad. One of my most amazing stories is a young mom who was driving to pick up her husband at the airport and she was driving past the hospital and she's like, you know what, I just feel really bad. She drove in and had a cardiac arrest while parking, like getting out of her car and going to the emergency room, and she's alive today. Healthy. Everything is good. And she's so grateful that she made that decision because if she had stayed in her car, the outcomes could have been very, very different, not only for her but for other innocent people on the road. Again, education, get in, don't be afraid to ask. And we don't want to fearmonger or scare people. You know overall, like cardiac things are very, very, very rare. But we want to educate so that people know when something happens, how to manage it appropriately.

Emily Kumler: And one of the things that I like to do on this podcast is to give people who, you know, most of our listeners would be the patient, not the doctor, right? So, if somebody goes into an ER and they're told, oh, you're probably having a panic attack, should they ask for a certain kind of like, you know, sort of push the practitioner a little bit farther to do more testing or like is there any recommendation you have in that situation?

Dr. Wood: Well, I think panic attack to me is a diagnosis of exclusion. If someone comes in and they're hyperventilate, okay, young teenager or hyperventilating maybe did or didn't do some type of a substance or maybe is just very, you know, clearly histrionic

²⁵ <https://www.ahajournals.org/doi/full/10.1161/CIR.0000000000000564>

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<https://www.mayoclinic.org/departments-centers/cardiac-catheterization-laboratory/overview/ovc-20442207>

²⁷ <https://www.mayoclinic.org/tests-procedures/coronary-angiogram/about/pac-20384904>

agitated, that sort of obvious panic attack, settle them down, see how they're doing. At least do an EKG. You know, but you have a woman that's, you know, over the age of 20 with some cardiac symptoms, any cardiac symptoms, any of those things I mentioned, an EKG and Troponin should be done. And if those are normal and the person feels better and there's no indication of anything wrong, then maybe it is in fact a panic attack. People often have histories of panic attacks, people know what they feel like. They often have a history of anxiety. It's very uncommon for a person with no anxiety to just randomly have a panic attack. So I think, you know, digging down, getting a little bit more information, but it's really quite interesting that the number of panic attacks has probably gone down as the number of heart attacks has actually gone up.

Emily Kumler: But that makes it sound like a diagnostic thing, right?

Dr. Wood: Exactly. It's a recognition and diagnostic thing. So you know, you have to recognize that this, these tests should be done and then you need to do them. And you know, we now have the high sensitivity troponin marker in our emergency room, which is very good at picking up low levels of troponin leaked by the heart in the setting of an issue. So it's really critical to get that information.

Emily Kumler: And how long is that circulating? Like could somebody have SCAD and recover from it on their own and then, or that's not possible because they would suffer a heart attack and they'd have to go?

Dr. Wood: No, no. There are plenty of people who probably had heart attacks at home and didn't know and without intervention did okay. It's just that they are at risk to not know that information because we do change a lot of aspects of, you know, medications, you know, different approaches to things like subsequent exercise, subsequent, you know, reproduction, etc. And certainly if the heart is damaged, we can prevent that damage. If we know about the heart attack in advanced and sometimes we can put [stents](#)²⁸ in if we need to. In uncomplicated, you know, clear cases where it would be straightforward to do so. So you know, getting in and getting evaluated is critical to prevent those complications from happening. Like you know, a big heart attack, sudden death, and things like that.

Emily Kumler: And so how far out can you test?

Dr. Wood: Troponin will be positive within a few hours and it will stay positive for several days. The way that we kind of differentiate where someone is on the curve of Troponin is by checking multiple levels to see whether it's still going up or it's going down.

Emily Kumler: Hm, that's interesting.

Dr. Wood: And if it's really elevated but it's going down, we know that their event probably has completed. If it's really elevated and it continues to rise, it doesn't really give us a lot of information about when it started because they're having ongoing injury to the heart

²⁸ <https://www.nhlbi.nih.gov/health-topics/stents>

muscle that's active. So it does help us a little bit with a timeline. And then there are some more old fashioned blood tests if the Troponin is normal. But it looks like, wow, this person might've had a heart attack a few days ago or more than several days ago. You know, we can look at the heart muscle, we can look at the EKG and things like that to determine whether or not we think we missed a heart attack and then certainly a [cardiac MRI test](#)²⁹ allows us to identify whether or not the heart muscle has been damaged and whether or not that damage is localized to sort of one blood vessel territory.

Emily Kumler: That's so fascinating. I feel like there's so much with testing that like makes me want to just have my whole body tested for everything. Every episode, I'm like, Jill, I think I have that. I'm sure that's what it's like to go through medical school or be a doctor or maybe even be like a kindergarten teacher around sick kids all the time.

Dr. Wood: I mean I think you're right, but I think you know, I am just, I'm such a glass half full like let's be positive. You know, all this is going to get better. I mean, I think the right attitude is so important and I just want to emphasize being aware of your family history, your own personal history, doing everything you can to manage any issues you have and then manage your stress because young women and men have so much stress today because of the pressures placed on them economically. You know, from a family perspective, the amount of new information that's out there that we have to process that we have to kind of, you know, bring into our lives on a daily basis. There's a lot. And I think learning to take some time to manage your emotional health and, and just like flossing your teeth in the morning, taking some time to make sure, checking in, relaxing, learning techniques to manage acute stress. I can't stress how important that is because so much of cardiovascular disease is made worse by emotional stress.

Emily Kumler: After learning what SCAD was, I was eager to talk to somebody who had actually experienced it. And I think one of the big takeaways for this podcast is always you have to be your own advocate, but also listen closely to these stories. You're going to hear how women sort of disregard our own feelings or are worried that we're not going to be taken seriously or that it's going to be a waste of time to get checked out.

Beth Shelburne: My name is [Beth Shelburne](#)³⁰. I am 44 years old and I'm from Birmingham, Alabama. I'm a journalist and a writer. [I survived a SCAD heart attack in April of 2018.](#)³¹ Before that I had no known health problems. I was a perfectly healthy 43 year old mother and wife with a very active life and no real risk factors, that I knew about, for heart disease.

Emily Kumler: You were in the newsroom when it happened, right?

²⁹ <https://www.nhlbi.nih.gov/health-topics/cardiac-mri>

³⁰ <https://www.wbrc.com/authors/beth-shelburne/>

³¹ <https://www.wbrc.com/2018/10/03/story-my-heart/>

Beth Shelburne: I had actually been in the newsroom for about 12 hours, but my heart attack happened after I left work, so I had worked a very long day. I was under deadline and was filing a complicated investigative story and there were technical problems when the story was executed, which as you know, in broadcasting, can be incredibly frustrating. So I left work not in the best place mentally, but that wasn't really unusual. I had been working in TV news for almost 20 years, so I had had my fair share of technical problems and long days and complicated stories that I had worked on. I left work and went to a supermarket on my way home from work and was standing in the produce aisle looking at strawberries when my symptoms started. And in hindsight, I experienced a little bit of the same symptoms the day before, but they had gone away. I remember telling my husband, my heart attack happened on a Monday evening, I remember telling him on that Sunday afternoon, the day before, I have a really weird sore throat all of the sudden. My throat felt very tight, like it was constricting. It was like deep in my throat. A kind of ache and tightening and that's how it started. I felt somewhat light-headed and disoriented because this constriction around my throat was so unusual. Now, I have had panic attacks in the past, so my initial thought was, I think I'm having a panic attack. And I was in, you know, a public place and actually a friend called me on the phone right at that moment. The week prior to this, I had just defended my master's thesis and he knew that, so he was calling to ask me how my thesis defense had gone and that had been a really stressful culmination of graduate school that I did while I was working full time and he knew all that. I was starting to tell him about how my thesis defense went and I just said, listen, I don't feel well, you know, can you call me back? And I got off the phone with him and at that point the constriction sensation had gone into my chest. I felt sort of hot, a little sweaty, symptoms that you might associate with a panic attack. I felt like fight or flight kicking in; I wanted to get out of there. I wasn't sure what was happening. There were people all around me, so I had a couple things in my basket, including strawberries, and instead of like getting medical help or really thinking about what was happening, I went for the checkout line and bought my groceries. As these symptoms were worsening, I just remember thinking like, I just want to get home. I checked out, went to my car, drove myself home. As the symptoms were getting worse and worse. I remember thinking briefly, should I pull over? No, I think I'm okay. I think I can make it home. I wasn't really sure what was happening, but I just wanted it to stop. You know, you're not really investigating what's happening as it's happening. You're just thinking sort of like a migraine coming on. You're not really wondering, I wonder why I'm getting this headache. You just want it to stop. So I get home and I carry my groceries up a flight of stairs. I put them down on the kitchen counter. I remember looking at my dog, he was in his crate where he'd been all day, and saying, sorry buddy. And I walked down the hall, went into the bathroom, I ran a bath. At this point I remember being very clammy. My face was sweaty. It was just a really strange set of symptoms and I think I was a little disoriented. I opened up our medicine pantry and happened to grab a bottle of aspirin and I took two aspirin and a bottle of tums and took two tums because the constriction, the tightness had expanded into a kind of ache and burn. It felt like very bad heartburn that was radiating up through my chest, into my throat, and back down into my chest. So it was like moving around.

Emily Kumler:

And did you still think it was a panic attack at this point?

Beth Shelburne:

I don't remember thinking what is this? I just wanted it to stop. I mean, I think I had thought in my head at the very beginning, oh, this is a panic attack because I've had them before and I just didn't think beyond that. I just wanted the symptoms to stop. So, I took the meds. I got in the tub. By the time the tub was like half full, my symptoms had stopped. I mean, I remember at the worst point, kind of laying back in the bathtub and thinking like, what the hell? And this radiating pain was actually going up into my jaw at that point and sort of like rattling my teeth. It was like an electric current, feel it in my teeth and then poof, it went away. So, I was still sitting there. When my husband and daughter got home, he poked his head in the bathroom and saw me, saw the groceries, the counter, and he said, are you all right? And I said, I think I just had a really weird panic attack. I think we said one or two other things. He's like, well, are you all right? And I said, yeah, I think I'm okay. And we went on ahead with our evening. I got out, got dressed, had dinner with my family. My daughter and I, we sat on the couch and watched American Idol and I think I kind of put it on a shelf and didn't want to think about it for the rest of the night. You know, it was weird, but it went away and I was tired. I'd had a long day, so I went to sleep.

Emily Kumler:

Well you were probably exhausted too, right? You'd worked a long day. If you thought it was a panic attack, that then is overwhelming and upsetting in and of itself. Right? So like then you're sort of just trying to recoup not knowing how severe the underlying problem actually was.

Beth Shelburne:

Yeah. I hadn't had a panic attack in over 20 years. I was diagnosed with just generalized anxiety when I was in college and then had some panic attacks while I was in college. But, you know, they just kind of went away on their own and I always felt like I was managing my anxiety without medication. I, you know, the truth is I wasn't really managing it. I thought I was, but I was living with it, really. But you know, we went to sleep. I remember being tired, but I didn't have any other symptoms after they went away. I didn't have any residual achiness in my chest or anything like that. One other symptom I forgot to mention at the height of it, when I was feeling the kind of vibration in my jaw and teeth, I was very nauseous. I got very nauseous. And then, you know, when the symptoms went away, it was like total relief. So, I went to sleep and I woke up the next morning very early and immediately thought I need to figure out what happened to me yesterday. And that's when my husband and I started talking. I started googling. I googled, you know, symptoms, panic attack versus heart attack. And I think in my mind, I mean, I'm a journalist and I've done a lot of health reporting. I knew the symptoms of a heart attack. I knew what I had experienced was nothing like the panic attacks that I'd had before. I never had pain in a panic attack. I never had, you know, sort of boiling heartburn like I experienced during my heart attack. My panic attacks: I did have some throat constriction, but it was almost like hyperventilating. I felt like I couldn't breathe. This was definitely different. I remember saying to Kevin, my husband, I had never experienced those sensations that I felt yesterday in my life. This was something different. So when I was googling and we were talking like, what do I do? Do I go to my primary care physician, am I going to take a sick day? Like what do I need to do? I ran across a list and I think it was Harvard Medical

Beth Shelburne: Well, I think that there's not a lot of cardiologists who specialize in SCAD. The body of work and knowledge and research is growing every day. But I was made aware very early on that there's a couple of cardiologists in the country who specialize in SCAD. One of them is [Dr. Sharonne Hayes](#)³⁷ at Mayo, and we actually have a mutual friend. So, he heard about my heart attack on social media and he reached out to me and said, you know, if you want to get to Mayo Clinic, Dr. Hayes is a friend of mine. I just kind of felt like the university hospital that I went to, they took really good care of me, but it was very much a boiler plate approach to treating a heart attack, kind of a one size fits all. And because I'm a journalist, I really want to know everything that I can know about anything, but especially my health or my family's health. So, I found a cardiologist that would be okay with me getting a second opinion and would actually support it and advocate for it through my insurance and made an appointment to see Dr. Hayes. What I was able to learn from Dr. Hayes and from of course like reading the research that exists, is we don't really know why exactly scad happens to women, but what is known is that there is some kind of hormonal connection. There is some kind of connection to stress is some kind of connection to pre-existing genetic conditions. The most common of which is [fibromuscular dysplasia, FMD](#)³⁸, which I was diagnosed with at Mayo Clinic. So, that was part of being seen in Mayo SCAD clinic was getting a full evaluation for FMD, which I do have. Dr. Hayes was able to kind of describe to me what that means, how serious my FMD looks compared to other patients, what I can do moving forward, which is pretty much nothing because FMD isn't really treatable. The research on FMD, like SCAD, is still developing and growing.

Emily Kumler: Can you talk a little bit about what FMD is and how you were diagnosed with that, too?

Beth Shelburne: I was just going to say I'm really happy to know that I have FMD. That was the problem that I ran into with my original cardiology team is they didn't really think it was important to do comprehensive screening because there is no treatment for FMD. But for me personally, it was really important for me to know whether or not I had it and Dr. Hayes actually advocates that all SCAD survivors be screened for FMD, because moving forward it's very important to know that you have it. If you have symptoms again, you know you can tell medics, hey I have fibromuscular dysplasia because if you come in with extreme lower back pain, if you don't know that you have FMD medics and doctors won't necessarily be looking for a dissected artery. But FMD is essentially, from what I know about it, and I'm certainly not an expert, but the way that I explain it to people from what I've read and what has been explained to me is it's wonky arteries. You have different abnormalities in your arterial beds, anywhere in your body, and the most common one is called beading and it literally looks like a chain of pearls and it's just a tissue buildup that can cause a blockage that can rupture and cause

³⁷ <https://health.usnews.com/doctors/sharonne-hayes-7462>

³⁸

<https://www.mayoclinic.org/diseases-conditions/fibromuscular-dysplasia/symptoms-causes/syc-20352144>

bleeding, which can lead to a heart attack. I know that my FMD is mild. Dr. Hayes was able to tell me that after I had a full head to pelvis [CT scan](#)³⁹.

Emily Kumler: As you age, that's something that builds up. So, like, if you had done similar testing when you were much younger, would they have been able to see it or no?

Beth Shelburne: They don't really know. Doctors do not know if patients are born with FMD or if it develops some time in puberty. There's kind of two working theories. They do not believe that it is progressive. They think that it's there and that it kind of stays there. Sort of like an aneurysm. It's either there or it's not there. There was some evidence that they found that I had a previous dissection that had healed in one of my carotid arteries and Dr. Hayes asked me like, do you remember ever, you know, having any kind of neck pain? You know, I mean, of course I've lived a life and I've ridden roller coasters and I've been in one or two car accidents and who knows? And there's no way to know.

Emily Kumler: So one of the things that I think is really important for us to highlight in this episode is that these dissections can heal themselves, right?

Beth Shelburne: Absolutely.

Emily Kumler: And yours did, but they are still very dangerous. Can you talk a little bit about that? Because I feel like it can be very easy for people to sort of misconstrue this idea of like, well it happens, sure. But then it heals. So like what's the big deal? And it's like, no, it's still real. You're still having a heart attack. I mean it's like this is still a major event.

Beth Shelburne: It is a major event. Not all SCADs lead to a heart attack. And not all dissections lead to a major health event like a stroke. But any time there's a dissection in an artery, it can be very serious. My dissection was in my [circumflex artery](#)⁴⁰, which is, you know, kind of a secondary coronary artery. And so, my heart attack wasn't as severe, but I still did have a heart attack. Any time you have a heart attack, your heart suffers damage. Oftentimes that can lead to complications down the road with scar tissue. You know, even if your heart recovers. When you're in the hospital, they take a measurement through EKGs of [ejection fraction](#)⁴¹, which is the volume of blood that your heart is pumping out. And that's how cardiologists are able to gauge how much damage has been done to someone's heart. So anything between, I believe it's 55 and 70, is considered the normal volume of blood. And I'm not sure what the actual measurement is. I just know the number 55 to 70, an ejection fraction of 55 to 70 is normal. The day after I had my heart attack, you know, my first day in the hospital after I'd had my angiogram, my ejection fraction was 45. So, that was very concerning because clearly my heart was weak and was not pumping as much blood as it normally should be. As I recovered, and that really just consisted of me taking a couple of different heart medications and resting, I would go back to the cardiologist periodically and I believe it was at six weeks, they did

³⁹ <https://www.mayoclinic.org/tests-procedures/ct-scan/about/pac-20393675>

⁴⁰ <http://www.vhlab.umn.edu/atlas/coronary-arteries/circumflex-artery/index.shtml>

⁴¹ <https://www.mayoclinic.org/ejection-fraction/expert-answers/faq-20058286>

Emily Kumler: Can you talk a little bit more about things that you guys have learned from the sort of repository of women in particular who you're looking at?

Dr. Hayes: Well, first of all, this is a condition of 90% of SCAD heart attacks are in women. It is a distinctly female women event. The other thing we learned is that it doesn't just happen around pregnancy. It is actually perhaps less common in pregnancy than we thought and more common in other conditions. Another important finding is upwards of 60-70% of people with SCAD, actually SCAD isn't the only arterial issue that they have. They have findings in other arteries, either other [aneurysms](#)⁴⁶ or dissections or a condition called fibromuscular dysplasia or FMD is another artery condition. It's an abnormality of the middle layer of the arteries that is also in 90% women. And so it may be that FMD or fibromuscular dysplasia is part of the cause of SCAD and so that's a new finding. The other findings we've had are that if we treat a SCAD heart attack just like we treat our regular heart attack due to plaque rupture, we may do a disservice and cause harm. So that's been why we have really pushed for making an accurate diagnosis at the time the patient comes in and has their angiogram.

Emily Kumler: And how is that done? You had said that it wasn't being done <https://utswmed.org/medblog/blocked-artery/> properly before.

Dr. Hayes: So first of all, the reason SCAD was underdiagnosed was one, the index of suspicion. And that's a way doctors say you have to actually think about it first before you can rule it out. People were seeing these young women and not even working them up for a heart attack. They weren't doing an [ECG](#)⁴⁷, they weren't doing troponin levels or enzymes, and so we know we missed some there. If they did catch the heart attack, the next step would be to do a coronary angiogram, or [heart catheterization](#)⁴⁸. So then they were sometimes missing it by diagnosing it as something other than SCAD. They were calling it run-of-the-mill plaque. They were calling it normal. They were saying it was spasm or small vessel disease or something else because they missed it. Because sometimes it can be subtle.

Emily Kumler: Because they were looking for the things that they knew to look for essentially?

Dr. Hayes: Exactly. So they were looking for a blockage in somebody and they would not see it. So, sometimes they would not see the more subtle finding that we will see sometimes in SCAD. The other thing that we have learned, and it's been shown by group in Canada, by Mayo, and also a group in Italy, is that we know, my colleagues who do interventions in the middle of the night on patients with heart attacks, [they're like 95% successful at opening an artery involved in a heart attack](#)⁴⁹ for regular types of heart attack.

Emily Kumler: You mean opening to like sort of clear out the blockage?

⁴⁶ <https://www.mayoclinic.org/diseases-conditions/aneurysms/symptoms-causes/syc-20354633>

⁴⁷ <https://www.mayoclinic.org/tests-procedures/ekg/about/pac-20384983>

⁴⁸ <https://www.mayoclinic.org/tests-procedures/cardiac-catheterization/about/pac-20384695>

⁴⁹

Dr. Hayes: To clear out the blockage in a way that was without complications. [In SCAD patients it's like 65% successful](#).⁵⁰ So, that tells us there's something different and it kind of makes sense. If you start going in and putting catheters and wires in, what happens is you actually can cause more damage. And it's important, to get back to your earlier question, what have we learned? Probably one of the most important things, in addition to how to diagnose it and what conditions are associated, is how to leave it alone at the time of diagnosis if the patient's doing okay. Because they may actually heal on their own. In fact the other learning is that SCAD arteries may heal within the first month or two all by themselves with just keeping patients less active and getting them aspirin and the like.

Emily Kumler: So that sort of explains how you could miss it, too. Because I think one of the things that sort of feels confusing to me is how do you miss a heart attack? If somebody is able to heal on their own, then you know, maybe that escalates the problem, doesn't necessarily fix itself completely, and they have another episode of something later on that's more catastrophic. But, it's interesting because you sort of wonder like was this being underdiagnosed or is the problem more prevalent today?

Dr. Hayes: I think it was largely underdiagnosed. I cannot answer the second question because we don't actually know how common this was in the 70s or 80s or 90s or 20 years ago. What we do know is, you know, and I'll lean on my history of advocating and dealing with women with heart disease in general. Before [Go Red](#)⁵¹, before [Heart Truth](#)⁵², which all came out in 2004, back in the 90s when we started our [Women's Heart Clinic here at Mayo Clinic](#)⁵³, one of the biggest findings was women were not even getting, they would go in even literally with classic heart attack symptoms, and they weren't being tested for it. They weren't being believed, they were being shunted off not to the acute care area. They were left in triage and then they were having their heart attack in the waiting room. We've come a long way with that, but that's one way you miss a heart attack is you don't even try to make the diagnosis.

Emily Kumler: That's outrageous, isn't it? I mean it's just unbelievable.

Dr. Hayes: Well, it's outrageous, but let me tell you, it is very believable from my standpoint because I've talked to literally hundreds of women for whom that happened. Now let me say that it has improved dramatically in the 20 plus years that people have been focusing on this problem. There has been raised awareness of heart disease in women by clinicians. There's been raised awareness by emergency medicine people and EMTs and raised awareness by women themselves taking themselves into the office. It is very gratifying for me when I have a patient sitting in my office and they say, oh, I thought it was just indigestion, but my doctor, he did a stress test and that's why I'm in your office. So things are better. But I almost get PTSD myself when I see these young women, you know, in their 30s or 40s, who now they're having the same experience that basically all women had back in the 90s and early

⁵⁰ <https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.112.105718>

⁵¹ <https://www.goredforwomen.org/>

⁵² <https://www.nhlbi.nih.gov/health-topics/education-and-awareness/heart-truth>

⁵³ <https://www.mayoclinic.org/departments-centers/womens-heart-clinic/overview/ovc-20442061>

2000s. So, I think continuing to raise awareness among the women, too. If they're having symptoms that they think might be due to their heart to actually mention that when they go into the emergency department and say like, I'm worried I'm having a heart attack. So if that clinician, that emergency medicine staff, isn't that thinking that at least that it'll put it on the radar.

Emily Kumler: And is that because women are often told that it's a panic attack or something emotional based?

Dr. Hayes: [Women are more likely to have their cardiac symptoms attributed to something else.](#)⁵⁴ Menopause, a panic attack, anxiety, something else other than being taken seriously. And there are so many studies that show this, not just about cardiac diagnoses but about other things. But this is an important one because obviously if you don't receive prompt care for a heart attack, you can have a fatal [arrhythmia](#)⁵⁵. If you're not in the hospital and not be resuscitated, you could have a larger heart attack than you otherwise would have. That's why, in addition to saying yes, SCAD is important to recognize as SCAD, and isn't it as important to women, and to me, that the heart attack itself is recognized? That's sort of that first step because you don't even get an angiogram to find out what kind of heart attack it if you haven't actually had somebody listen to you about your symptoms.

Emily Kumler: Just to sort of dive into this a little bit deeper, when we talk about the role of estrogen, I mean I think it's interesting that this was sort of considered a pregnancy diagnosis for a long time or it was most commonly diagnosed around pregnancy. And now we're realizing that it's not and certainly heart health deteriorates or becomes more precarious around menopause. And so I'm sort of interested in, with something like SCAD in particular, is this related to the thinning or like you know, the sort of the lining thinning out in some way because of a decrease in estrogen or what is the sort of estrogen interplay?

Dr. Hayes: We don't entirely know and in fact, particularly around the pregnancy issue, that is more hormonal fluxes. So it is a period of rapid ups and downs, [particularly around delivery of both progesterone and estrogen that we think is probably important.](#)⁵⁶ There doesn't appear to be an increase, a bump, around menopause, which is a time of declining hormones. And in fact it tends to be a middle age and early menopause sort of demographic in that age is somewhere in the 42 to 50 range. So, actually the average age is before menopause.

Emily Kumler: So there's a reprieve during that period?

Dr. Hayes: We have patients who've had SCAD in their 60s and 70s. I won't say it's a reprieve, but it's not a time of increased risk. If anything, it's somewhat declining.

⁵⁴ <https://www.sciencedirect.com/science/article/pii/S0147956318303054>

⁵⁵ <https://www.mayoclinic.org/diseases-conditions/heart-arrhythmia/symptoms-causes/syc-20350668>

⁵⁶ <https://jamanetwork.com/journals/jamacardiology/article-abstract/2730292>

Emily Kumler: That's interesting, right?

Dr. Hayes: And some other interesting findings that speak more to the hormonal fluxes is that after SCAD some patients, and we've published on this because so many doctors said they'd "never heard of it," so I wanted to make sure it got into the medical literature, but women described, after SCAD, [having chest pain around their periods](#)⁵⁷. So the day or two before they start menstruation, for those who are premenopausal, we've had a few patients who have been early postpartum that actually got onset of their heart attack symptoms while breastfeeding. Those are times where there's clearly hormonal fluxes. Premenopausal women have constant fluxes of their reproductive hormones, so clearly that has something to do with it. But without having catheters in and measuring them across time, it's quite challenging to put that connection together. But why this happens more frequently in women, why this happens around pregnancy, or why people may have exacerbation of their chest pain around their periods are all things that are ripe for better understanding through research and may help us inform care of other cardiac conditions that occur in women, particularly premenopausal women.

Emily Kumler: And women have been, I mean I feel like we can't emphasize this enough, like very under-represented in heart studies over time. I mean I feel like you look at some of the earlier heart studies and it was all men.

Dr. Hayes: Right. So, if you think about one of the federally funded, our tax payer dollars, largest studies that really came out to help us understand risk factors of hypertension, smoking, and cholesterol: the acronym was [MRFIT](#)⁵⁸. Tens of thousands of men, no women. And it wasn't until the [Women's Health Initiative](#)⁵⁹, almost 20 years later, that they included women with any type of risk factor assessment. So, women are underrepresented in research. One plug I would say is if you are ever asked to be in a medical research study, even if it is as a normal control or normal volunteer, don't immediately say no. There are many reasons why women aren't included and sometimes it's because the study design didn't include women and sometimes it's because women weren't asked or offered to be a part of it. But actually, women are more likely to say no when asked to be in research. So I think if I put in one plug, if we're going to increase the body of knowledge about women with heart disease and other conditions is having them be a part of the research.

Emily Kumler: Bravo. I agree. You know, and I think just to go back to SCAD for a second, spontaneous dissection is pretty vivid in its naming of this, but what's happening is that the vessel is sort of ripping apart, right?

Dr. Hayes: This is true.

Emily Kumler: With pregnancy, you obviously have a lot more blood, like your blood volume doubles pretty quickly within the first trimester, I think. Does that have anything to

⁵⁷ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5957076/>

⁵⁸ <https://jamanetwork.com/journals/jama/fullarticle/182557>

⁵⁹ <https://www.whi.org/SitePages/WHI%20Home.aspx>

do with it? I mean I feel like are there any, like is obesity contributing to this as it seems to be contributing to everything else? Like the bigger your body, the harder your heart has to work. Like are there any kinds of other things that sort of help to explain why this happens in women?

Dr. Hayes: There are estrogen receptors in every artery in our body. So estrogen very much has effects on our arteries. The thing about the increased blood volume in women when they're pregnant, yes, the volume goes up, but the sheer stress on the arteries goes down because vascular resistance, which is another measure, actually decreases. So blood pressure often goes down in women who are pregnant unless it's an abnormal pregnancy. So we don't necessarily think it's that. And obesity does not appear for SCAD. So I'll tell you, the almost stereotypical SCAD patient is a normal weight person with no conventional cardiovascular risk factors. Cholesterol is normal, blood pressure is normal or just a little bit high like many middle aged women have. They often are athletes, they are fit, then have this condition called fibromuscular dysplasia. So, at least 60-70% do. If you put that all together, you have these fit people with an underlying artery problem, this FMD. They're pushing themselves, perhaps. They are doing marathons, they're going to crossfit, they're doing other things. So part of the reason they may be more at risk is because the sedentary woman may not push herself enough to cause an issue that might damage her heart. And this is one reason why we advise people, after SCAD, not to do extreme exercise, not exercise, do endurance training, not exercise, not do competitive sport, not push themselves to exhaustion. That is probably with an abundance of caution. But about 25% of people with SCAD have some prior history or have their SCAD happen during either very extreme emotional stress, and this isn't fighting with your husband, this is my house burned down. I'm in a major lawsuit, I've lost my job kind of thing. Or extreme physical activity. Like I just, you know, ran a marathon or I've just started a workout program and now I'm going to crossfit. Those are things that I hear repeatedly from people. So it may be they had this predilection but never pushed themselves or never had the perfect storm that caused their artery to tear.

Emily Kumler: Just to get into the physiology of it a little bit. It's not that there's something passing through that rips it? It's that the tissue itself sort of like spontaneously combusts or like rips open. Is there any indication that it's thinning before or that it's damaged?

Dr. Hayes: No, and in fact these arteries, even when they heal, I mean if you do an angiogram a couple months after and if somebody had a healed SCAD, you can't even tell it was abnormal. I think there's a lot of interest right now to find out either pre- or post-SCAD, if there are any signs that there was any abnormalities before. The few studies that have been done, and you can imagine because these would have to be invasive studies of blood vessels, nobody's really excited on putting catheters down arteries of patients who've already had a ripped artery, and that's one of the limiting factors on studying this condition after the fact. But it does appear in most individuals that they have otherwise normal arteries unless that may be affected by this fibromuscular dysplasia.

Emily Kumler: And then is there something in particular about the tissue around the heart, like it's not like [epithelial cells](#)⁶⁰ or something that resembles something in other parts of the body that might be triggered more by estrogen?

Dr. Hayes: There's no reason to believe that coronary arteries are more affected or have more receptors than others. Think about a coronary artery almost being like the canary in the coal mine. Because if you have a dissection, I mean people do have dissections of other arteries in their body that they don't even have a symptom from because it doesn't disrupt flow or it does and it's a bigger artery. The heart needs oxygen 24/7: every minute, second of the day. So even a small disruption of blood flow or oxygen is more likely to cause symptoms and to be a problem. I will tell you that it is not in substantial minority of patients with SCAD who we do this special CT screening, we find they've had dissections elsewhere and they never had a symptom. They had a dissection in their carotid artery or in an artery in their abdomen. And I'll ask them, I said, did you ever have neck pain or stroke like symptoms? And really, even if they think hard, did not. So I think the heart is unique in that it is very unforgiving if it has even a transient lack of blood flow, whereas other organs and parts of our body do just fine.

Emily Kumler: I tend to think of an aneurysm as an artery that is sort of ballooning in a like sort of swelling and then breaking. That may not be accurate.

Dr. Hayes: Yeah, that's close.

Emily Kumler: So, how is SCAD different from that?

Dr. Hayes: So SCAD is usually a normal size blood vessel for which the inner layer of the artery separates from the muscle layer and there's a bleed in between. So think about a bruise between layers of the artery and sometimes all it is a bruise and a bulge of that artery into the lumen of the artery, you know, that may have struck flow. Sometimes that bulge or balloon breaks and there's a little flap of tissue that is the tear. It is almost a balloon in, not a balloon out. So this is a normal artery.

Emily Kumler: One of the other themes that we're sort of unintended, but it's certainly coming through, is how many female physicians we're talking to, or researchers, who are looking at the female body. I mean it's nearly impossible to separate the two. That like, there's so much interesting research coming out on sex differences and it feels in large part like the more women get into these positions where they can control their own research that they're asking these questions that you have, you know, certainly done in your career.

Dr. Hayes: I did not set out when I graduated from medical school or cardiology school to be researching women's health. Honestly, that was not on my list. I was an echocardiographer imager. What I found was that I had disproportionately more women in my clinical practice. I didn't realize that because you only know your practice, you don't know what the guys down the hall are doing, and as I took care of these women with heart disease, I

⁶⁰ <https://www.sciencedirect.com/topics/neuroscience/epithelial-cells>

realized when I was sitting in the office with a man, I had all this evidence, I had MRFIT to tell me to put them on a [statin](#)⁶¹. I had oodles of data on which stress test to pick and how accurate that stress test would be and how likely it would predict that they would have coronary disease if I did that stress test. And I would use the same approach with women and it was different results and that really was how it emerged in the 90s it was when we were recognizing that women's outcomes with heart disease, and I was in the middle of it, seeing that we needed to change that. That story is not unique to me, I don't think. I think that there are others. Patients gravitated to them or their colleagues gravitated the women to them because they didn't want to care for them or couldn't figure them out because we didn't know. And at first I kind of resisted it as like just because I'm a woman, I shouldn't like be doing this. And then I realized if I don't, who will? There was a certain part of that and then I realized like this is a real opportunity because I can make a difference, probably disproportionately more than studying echo or I'll study what are the echo differences, sex differences in [echocardiography](#)⁶², that might be, and then realizing there were differences everywhere we looked and we weren't taking those into consideration as we designed tests, as we designed treatments, and as we advised our patients. So I think that's a motivator for a lot of women who end up in jettison of whatever type is sometimes personal experience, sometimes recognizing, wow, there's an open space that no one else is addressing and it needs to be addressed. I think that what we have learned about heart disease in women over the past 20 years should make everyone humble about what we don't know now that we think we do.

Emily Kumler: I'm Emily Kumler and that was Empowered Health. Thanks for joining us. Don't forget to check out our website at empoweredhealthshow.com for all the show notes, links to everything that was mentioned in the episode, as well as a chance to sign up for our newsletter and get some extra fun tidbits. See you next week.

⁶¹ <https://my.clevelandclinic.org/health/articles/17506-statin-medications--heart-disease>

⁶² <https://www.mayoclinic.org/tests-procedures/echocardiogram/about/pac-20393856>