**Scott Webb:** Aortic stenosis is a type of heart valve disease that is common and often treated now using the TAVR procedure and joining. To tell us about both is Dr. Jason Schott. He's an interventional cardiologist with the Memorial Health System. This is Memorial Health Radio, a podcast from Memorial Health System. I'm Scott Webb. So Dr. Schott, I know that Heart Month is coming up and we're gonna talk today about aortic stenosis and TAVR, and I've learned about TAVR before, but I can't wait to hear sort of your explanation definition, how you're using it for aortic stenosis. Just as a baseline here as we get rolling, what is aortic stenosis?

**Dr. Jason Schott:** Aotic stenosis is narrowing of the aortic valve, which is one of four heart valves. And this often happens, with age or any kind of systemic inflammatory disorder where over time there's inflammation of the valve leaflet and it attracts calcium that then embeds down on the leaflet. And it affects its ability to open up. And so this is a valve that's in between the main public chamber of the heart and the rest of the body. So that can cause certain symptoms such as shortness of breath, particularly with exertion or even chest pain with exertion.

It can also cause, you know, passing out or feeling like you're going to pass out. The body's ability to increase it s cardiac output when it exerts themself is really dependent on the ability to increase the contraction of the heart, increase the heart rate, and then it also increases, , the blood vessel's diameter so that more flow can occur. And whenever you've gotta fix obstruction like the valve that's between the pumping chamber of the heart and the rest of the body, this inhibits the body's ability to increase its output. Also aortic stenosis since the pumping chamber of the heart is pushing against a tight valve. It's quite a high pressure.

So it's like going to the gym for 24/7. the muscle gets thick. So, the pumping chamber of the heart has to not only squeeze, but all has to relax to receive blood. And if it' s really thick and it doesn't do a very good job of relaxing and so that, can Back up blood or pressure back to the lungs, which is, where the blood is coming from. And so that can cause shortness of breath, the chest pain passing out, feeling like you're going to pass out, that sort of thing.

**Scott Webb:** All right, so you mentioned some of the signs and symptoms there, and sometimes folks confuse them with other things. Of course, we know that time is brain, time is heart. What are the risk factors? Is it genetics, family history, lifestyle, behavior, lifetime of eating too much bacon, who's at risk for aortic sten?

**Dr. Jason Schott:** Back in the sixties, the, large portion of people with aortic stenosis was from rheumatic fever. But as access to healthcare and access to antibiotics has occurred at really rheumatic fever being the cause is much less. And now it's more what we call senile aortic stenosis, which is that progressive bedding down of calcium that occurs with age and things that put you at a high risk from an age standpoint are smoking, chronic kidney disease, high blood pressure. And then males tend to have aortic stenosis more often, just anecdotally. Another, entity that's out there that puts you at risk for aortic stenosis that's genetic i s bicuspid aortic valve.

So , normally aortic valve has three leaflets, but sometimes we're born with two, or even sometimes one. And the geometry of the trajectory of the flow through a two leaflet valve that causes, we think more turbulence, which causes more inflammation, which can cause calcium to bed down on the valve and make it narrow. Other systemic inflammatory disorders can cause narrowing of aortic valve. Again, it's that inflammation like rheumatoid arthritis for example. It's a chronic inflammatory disorder and that can cause inflammation of the valve and, cause to become narrow over time. So, any kind of chronic inflammatory disorder can predispose you to, aortic stenosis.

**Scott Webb:** Yeah, I see what you mean. And every good reason. And if we were doing a different podcast on rheumatoid arthritis, we would talk about it's not just affecting, all of your joints. It could be affecting other things like your heart, your valves. So let's talk about TAVR. What does that stand for exactly, and how do you use it to treat aortic stenosis?

**Dr. Jason Schott:** TAVR is transcatheter aortic valve replacement, and it's a minimally invasive way to replace an aortic valve. To best explain how it's done. If you could imagine like a corrugated baby gate that kind of accordions, if you were to open the baby gate, attach it into making a cylinder, so leaflets inside of it. Valve leaflet and then crimp that down on a balloon that's mounted on a shaft that has a hole running through it. And then put a wire across the native aortic valve that's diseased and run this apparatus over the wire in place to where you want it. Blow up the balloon expanding the valve.

You deflate the balloon and remove the system and the valve stays in. Another type of TAVR valve is made of a nitenal material, which expands. It's a composite metal made of titanium and, , nickel. And when it's meets a higher temperature, it expands the rock hard. But when it's cold, it's compressible. So you, you have this nitenal cage. Leaflet puts stone inside of it, and you compress that down, you put a sheath over it that constrains it. That sheath is delivered over a wire in place, and then you un sheath the valve and it expands in place where you want it.

And so, TAVR is a way to, replace a valve, , through a hole that's five millimeters incision, usually in the artery of a leg. And so it could be, Under conscious sedation, meaning you just have little sedation, but you're not fully asleep, you're awake. You can talk during the procedure. The procedure usually lasts an hour, and then it's usually an outpatient or, overnight, stay, go home the next day.

, It's been, compared against surgical aortic acid in multiple studies. And it's in our high risk media, intermediate and low risk. It's proven to be just as good as a surgical valve and in some instances, better than a surgical valve.

**Scott Webb:** So, what are the advantages? Think about from your perspective as the surgeon and from patients especially, what are the advantages? Is it just that it's, faster recovery time, smaller scars, less pain, thus less need for medications afterwards? Like maybe you can just kind of go through some of the the real benefits and the outcomes.

**Dr. Jason Schott:** The salient benefit is, the shorter recovery time. It's much more comfortable and there's no sternotomy that's involved, there's no cracking of the chest. The recovery times very short. , the studies that validated tavr, those studies were designed to show inferiority meaning to be as good as surgery and the absolute numbers of those studies showed that oftentimes there was, lower mortality. There was less kidney injury and less atrial fibrillation or major bleeding or even less stroke.

Now to be fair, you know, again, these were studies, powered for non-inferiority, but with a TAVR valve there showed to be more what we call paravalvular leak, meaning a little bit of flow that comes around the valve, , in between the valve and your native valve. But usually that's very mild and not significant. And then there's a slightly higher pacemaker rate. But the newer techniques that we've used and implemented in the last couple years have really driven down our pacemaker rates.

**Scott Webb:** Yeah, it's really amazing science technology, how things change, you know, so quickly and how that benefits really everybody involved. As we wrap up here, doctor, just final thoughts and takeaways. If folks have been diagnosed with aortic stenosis and they're trying to think about the best treatment option, the best plan for them, what would be your thoughts about TAVR? Why would you encourage them to consider that?

**Dr. Jason Schott:** Yeah, so firstly, you know, with aortic stenosis, once you are severe and you have symptoms, your prognosis really changes. If you've got shortness of breath or heart failure symptoms, your likelihood of needing a hospitalization in the next couple years are quite high, so once you have severe aortic stenosis with symptoms, you really should be thinking about, treating that as a mechanical problem. So the only way to treat it is with some sort of replacement. And TAVR is a very safe, feasible option that's a widely available. It is very comparable to the surgery, but I think everybody who undergoes any aortic valve replacement, should be evaluated with a heart team.

That means, should be your cardiologist, your interventional cardiologist, your cardiothoracic surgeon, among others. Put the most thought into the best way to replace your valve as, , a lot of our studies were, in patients that were 70 or older. But if you're young, like with a bicuspid aortic valve and you're in your fifties, then surgery may very well be the best option for you. So I think, , doing a heart team approach and then knowing that, that there are options out there that are very safe and feasible.

**Scott Webb:** Yeah, that's just, , such great advice from an expert. Get that team together and put their heads together and figure out the best plan for you, and then they'll presumably present that to you. You make the best decision you can in the moment. Obviously, time is of the essence, so thank you so much for your time today, and you stay well.

**Dr. Jason Schott:** All right. Thank you so much.

**Scott Webb:** And for more information, go to MHsystem.org/heart and please remember to subscribe, rate, and review this podcast and all the other Memorial Health System podcast as well. If you found this one helpful, please do share it on your socials and thanks for listening to Memorial Health Radio, a podcast for Memorial Health System. I'm Scott Webb. Stay well.