

5 Warning Signs You May Need Heart Valve Surgery



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Featured Speakers



Dr. Kevin Hodges

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[Learn More.](#)



Adam Pick

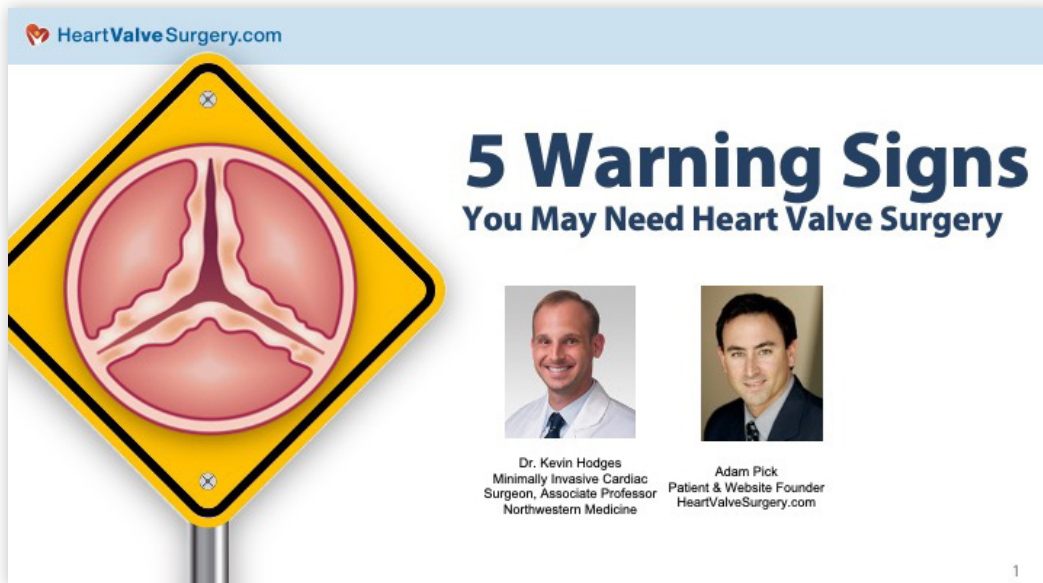
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Please note: A complimentary video playback of this eBook is now available on YouTube at [this link](#).

Introduction



Adam Pick: Hi, everybody. My name is [Adam Pick](#). If I have yet to meet you, I am the patient who started [HeartValveSurgery.com](#) all the way back in 2016. I'd like to extend a huge welcome to all the members who are coming on the line from places all over the world.

The mission of our website at HeartValveSurgery.com is to educate and empower patients just like you. This webinar has been designed to support that mission. We've had over 750 registrations and we're really excited about this topic because, as a patient, most of us are going to go through some "watchful waiting", most of us are going to think to themselves, "When is the right time for surgery?". We're going to work with our medical teams.

Today, we are very lucky that Dr. Hodges is going to be with us to share some of these warning signs that surgery maybe on your horizon.

Agenda

- Introductions
- Heart Valve Disease Insights
- 5 Warning Signs
- Questions & Answers
- Survey

During the webinar, you're going to be in what's known as "listen-only mode", but I encourage you to submit your questions throughout the webinar. Let's look at the agenda real quick.

We're going to go through the introductions. We're going to have some high level heart valve disease insights. We're then going to dive very deep into the five warning signs. We're going to have Q&A and then we're going to get into a very quick five-question survey as we wrap up the webinar.

 HeartValveSurgery.com

Dr. Kevin Hodges



- Cardiac Surgeon at Northwestern Medicine in Chicago, Illinois
- Minimally Invasive Specialist including Robotic Valve Surgery
- Focus Areas: Aortic valve, Mitral valve, Tricuspid Valve, Aortic Aneurysm, Atrial Fibrillation
- Assistant Professor of Cardiac Surgery, Feinberg School of Medicine at Northwestern Medicine

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Now, when it comes to the introduction of our featured speaker, I am honored and I'm humbled that he is taking time away from his very busy practice at Northwestern Medicine in Chicago, Illinois. Who is he?

[Dr. Kevin Hodges](#) is a cardiac surgeon and his specialties in particular are in minimally invasive heart valve surgery. Robotics is a core element of his practice, which has focus areas of aortic valve, mitral valve, tricuspid valve, aortic aneurysms, and atrial fibrillation. He's also an assistant professor of cardiac surgery at the Feinberg School of Medicine at [Northwestern Medicine](#).

Northwestern Medicine Patient Success Stories



Adam Pick: Now, I could go on-and-on about the accolades and achievements of Dr. Hodges. It's been great getting to know him over the years, but what I'd like to do is simply show you this.

This is a picture of the smiling faces of patients from the [HeartValveSurgery.com Patient Community](https://www.heartvalvesurgery.com) who have gone to Dr. Hodges and Northwestern Medicine and had very successful outcomes. You'll see here the smiling faces of Gene and Jim and Joe and Larry and Rob and just a whole lot of goodness has come from working with Northwestern over the years. I'm excited to keep this ball rolling at this webinar by welcoming Dr. Kevin Hodges.

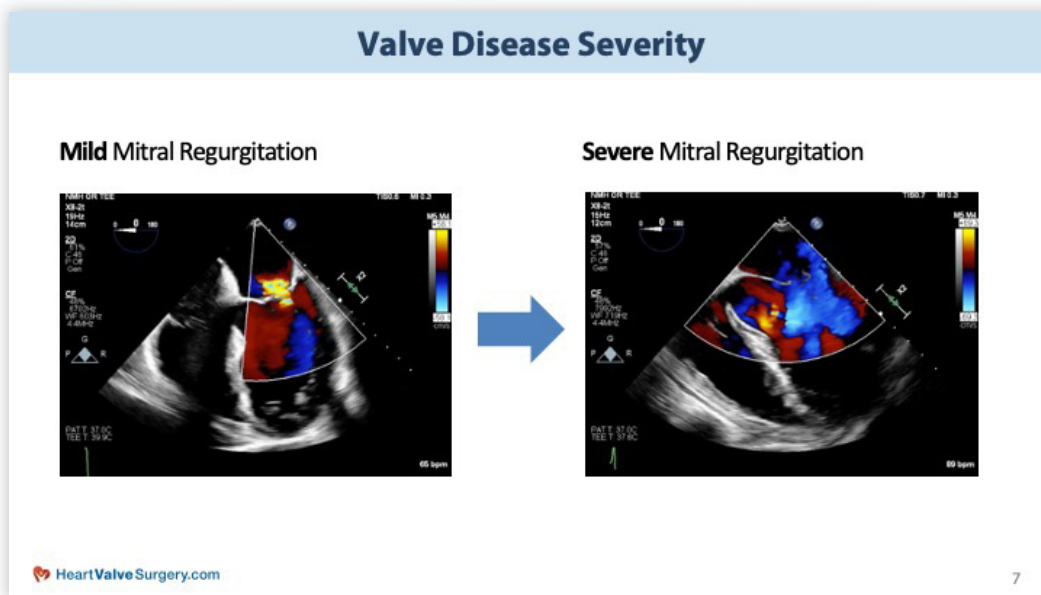
Dr. Hodges, thanks for being with us today.

Heart Valve Insights



Dr. Kevin Hodges: Thank you so much, Adam. I have to give you a shout out, actually, because Adam suggested this topic actually. It was a little bit tricky to put it together, but it's a fantastic topic because it really echoes so many of the conversations that we have in the office everyday at people who are maybe nervous or apprehensive or really thinking about what a heart valve operation might mean.

Let's dive in and get started. I just want to put this up because a heart valve disease, when we talk about people that might need heart valve surgery, it's really a huge spectrum. A huge number of people at some time or another throughout their life are going to be told by a healthcare provider that they have a heart murmur and a very few of them will actually progress to have a severe valve disease or to need a heart surgery. In some way, that's meant to reassure people, but also to know that there are tons of providers who are specialists and experts in this area that can help you navigate this issues and know if or when a procedure is right for you.



To illustrate that a little bit, I want to show this. These are two patients who have mitral valve regurgitation. On the left is a patient, I think, I operated on this patient for coronary artery disease or something unrelated who has mitral valve regurgitation that is mild and it doesn't even need a repair at the time of another heart surgery. On the right is the complete opposite spectrum. This is somebody who has severe mitral valve regurgitation, who is starting to experience symptoms of heart failure and who needed to intervene and fix their mitral valve.

Adam Pick: Dr. Hodges, real quick. We have some patients on the line who may be newly diagnosed. We may have some patients on the line who have had multiple procedures.

Dr. Kevin Hodges: Yeah.

Adam Pick: You knew very quickly the video on the right, it looks like a chaotic flow a red and blue versus something that's a little more orderly on the video on the right. Can you describe what's happening there with, I'm guessing, that's the blood flow?

Dr. Kevin Hodges: Yeah, absolutely. So these are pictures from a transesophageal echocardiogram. They're done in the operating room in this case, but this is a procedure that's sometimes done in the office. That shows blood flow through the heart. What that bright color is actually the high velocity or fast moving blood that moves through the leaky valve. What's opening and closing there is the mitral valve and in this patient, that's a little bit hard to see, this is just one representative picture. There's what we call mitral valve prolapse. There's a severe prolapse where some of the cords that hold the mitral valve in place have actually broken and the result is a lot of high velocity leaky blood flow going backwards into the left atrium of the heart. Even if you're not used to seeing echocardiograms, you can tell, as you said there's a lot more bright color, a lot more chaos there going on. That's a good way of putting it.

Then, in the picture on the left, where really there's hardly any leaky blood flow. The point here is that lots of people look like that echo on the left and they're walking around and they'll never need any sort of intervention. If it becomes the chaotic picture on the right, we have a lot of tools to figure out what the right thing to do is.

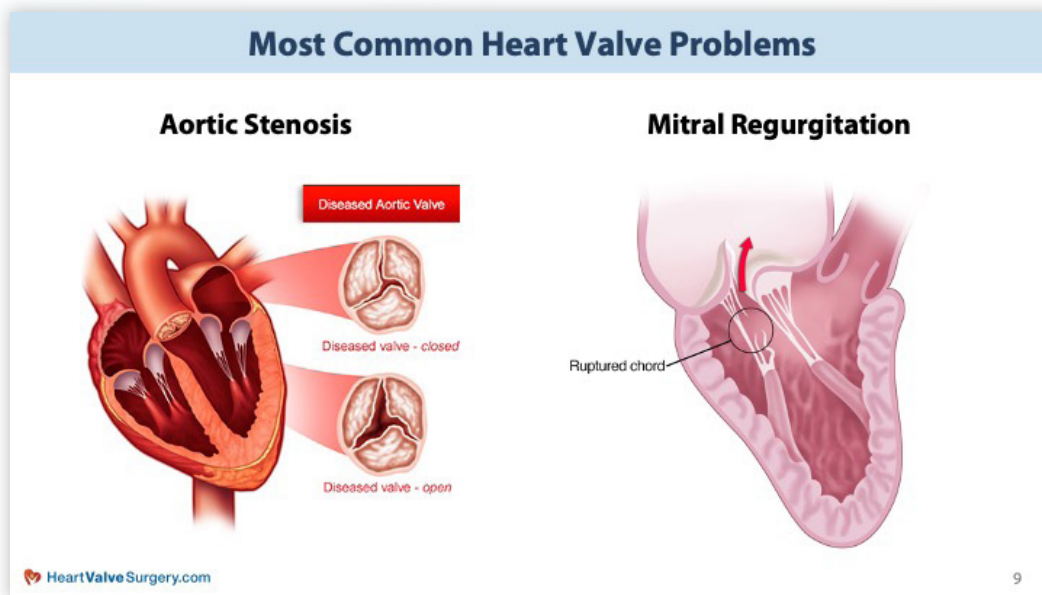
Medical Society Guidelines

■ American College of Cardiology / American Heart Association

Recommendations for Timing of Intervention in Aortic Stenosis		Recommendations for Timing of Intervention in Aortic Regurgitation		Recommendations for Timing of Intervention in Mitral Stenosis		Recommendations for Timing of Intervention in Mitral Regurgitation	
Class	Recommendation	Class	Recommendation	Class	Recommendation	Class	Recommendation
I	In patients with aortic stenosis, aortic valve replacement (AVR) should be performed when the patient is symptomatic and the aortic valve area is ≤ 1.0 cm ² .	I	In patients with aortic regurgitation, AVR should be performed when the patient is symptomatic and the aortic valve area is ≤ 1.0 cm ² .	I	In patients with mitral stenosis, mitral valve replacement (MVR) should be performed when the patient is symptomatic and the mitral valve area is ≤ 1.0 cm ² .	I	In patients with mitral regurgitation, MVR should be performed when the patient is symptomatic and the mitral valve area is ≤ 1.0 cm ² .
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This slide, I don't mean to dive into this really at all, except for one point will make later, which is that we have a lot of guidelines that are driven by a lot of evidence and a lot of studies over time to know what is the right thing to do for specific valve problems. This is a huge range of things and the American College of Cardiology and American Heart Association published these guidelines to show the evidence to support them.

A lot of experts have put countless hours into making these recommendations and they're there for us as providers, but also for patients to see sort of what are the scenarios where a valve intervention might be appropriate. the purposes of this webinar, we're going to use a lot examples that have to do with two of the most common heart valve issues, which are aortic stenosis or narrowed aortic valve or mitral valve regurgitation, which is a leaky mitral valve.



The purpose here is to highlight sort of big picture, sort of high level concepts of when a valve intervention might be needed, but a lot of these things apply to other valves as well. I know we have a question coming up at the end about the tricuspid valve in particular, which is a great question and we'll dive into that. We're going to talk about high level things. If you have a valve problem that isn't one of these two specific things, the concepts are still really applicable.

I wanted to sort of focus on two so that we can look at some of the data and some of the supporting echo pictures and things like that.

Warning Sign #1: Symptoms



Dr. Kevin Hodges: Warning sign number one is when you start to develop symptoms. The primary symptoms of valvular heart disease are the ones that I have in bold.

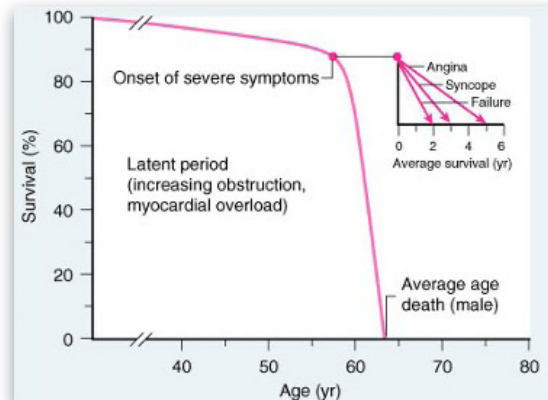
Common Symptoms of Heart Valve Disease

- **Shortness of Breath (Dyspnea, Heart Failure)**
- **Chest Pain (Angina)**
- **Dizziness (Syncope)**
- Fatigue
- Irregular Heart Beats (Palpitations)
- Leg Swelling (Edema)

In layman's term, shortness of breath or the medical terms we use are dyspnea or what this really is a symptoms of heart failure, chest pain or we use the term angina, or dizziness, and we use a term syncope to describe specifically the type of dizziness where you get lightheaded and you're going to faint. Dizziness is broad term and some people get lightheaded or have vertigo or things like that, it's broad. Specifically, light-headedness or this feeling of faintness can often be a sign of severe valve disease. That's not the only thing, and we'll talk a little bit about how we tease this apart, but some patients present with fatigue or just not feeling themselves. Some patients have irregular heartbeats or feeling some palpitations or some people may have swelling in their legs for retained fluid, what we would call lower extremity edema.

Progression of Symptomatic Aortic Stenosis

■ Natural History of Aortic Stenosis



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Eugene Braunwald, Circulation, 2018

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Now, we'll talk a little bit about why symptoms are so important. This is a graph. Bear with me in this -- some of these figures, we'll talk through them. I know they can be busy. This is something that everybody is familiar with if they went to medical school, this specific graph. What this shows is the natural history or the progression of aortic stenosis over time if it's not treated.

The pink line shows the percentage of patients who have severe aortic stenosis who are alive without treatment. This was before we had valve replacement available for people. For the most part, people do very, very well. The line stays up in there 100% for a very long time until people developed symptoms and you can see that pink line sort of drops off of a cliff.

Within a really about three years the chance of being alive with severe aortic stenosis and symptoms becomes very low. It's a very, very bad problem without treatment. You can see that if you start to fall into this category of developing symptoms, specifically, chest pain, light-headedness or shortness of breath due to heart failure, your life expectancy without a valve intervention is very low.

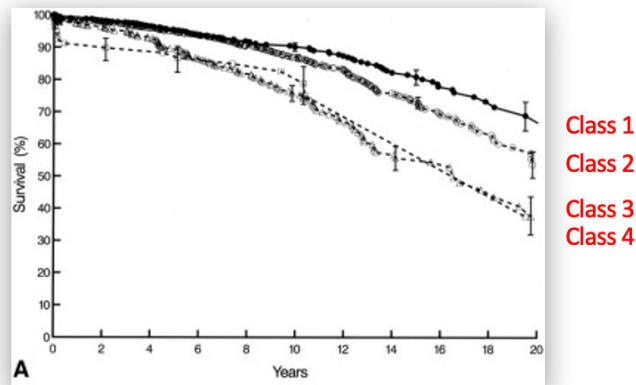
This is a no-brainer. If you have symptoms related to a severe aortic stenosis or really any severe valvular heart disease, it's time to do something about it.

Adam Pick: Just real quick, Dr. Hodges, I want to make sure everybody in the line gets this because it looks like the window here for doing that intervention is very narrow. It looks like if you don't have any form of treatment done within something like 24 months, 50% of the people are not living. Is that accurate?

Dr. Hodges: That's true specifically for aortic stenosis. Some of the other valve lesions, like mitral valve regurgitation, for instance, it's a little bit better tolerated, but in particular for this one, yeah, once you start to develop symptoms of aortic stenosis, there's really no time to wait. This is where you need to be thinking about having your valve fixed.

Outcomes After Mitral Valve Surgery

- Worse Symptoms, Worse Outcomes



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Gillinov et al., Annals of Thoracic Surgery, 2010.

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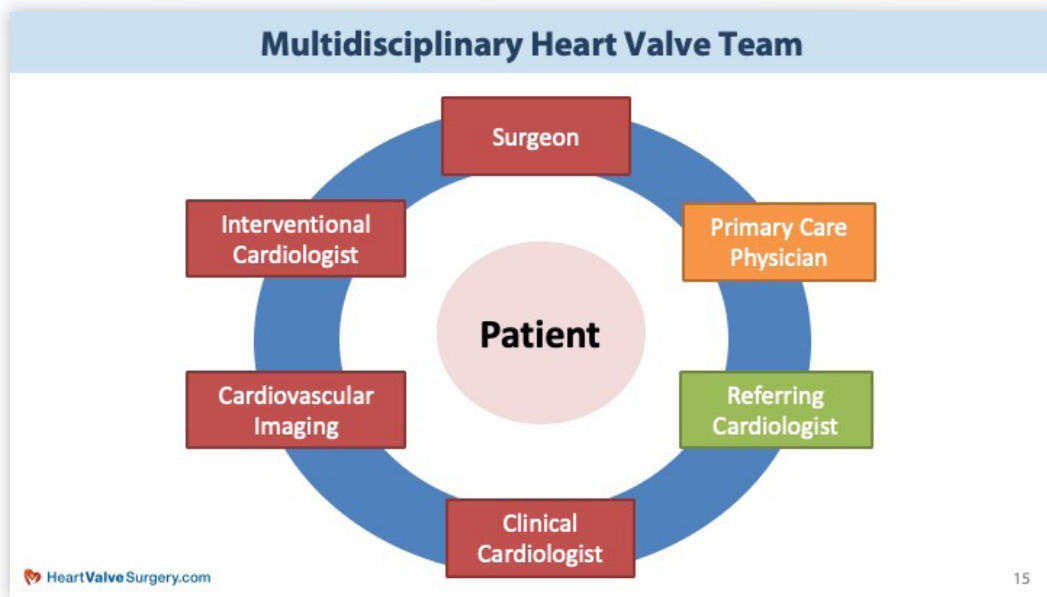
This slide is about actually not just if you have symptoms you do poorly without treatment, but once you develop symptoms, you actually do worse once you get your treatment. What this shows again, this is the same line of how many patients are alive, but instead of looking at without treatment, this is starting from the day of your valve surgery. This is for people with mitral valve regurgitation.

Class 1, 2, 3, and 4 are worsening class of symptoms. That's the New York Heart Association classification for heart failure symptoms. Class 1 is essentially no symptoms and Class 4 is very, very bad symptoms where you're essentially bedbound.

This shows if you come in at one of these levels how likely you are to be alive 20 years after your heart valve surgery. You can see that there's a clear differentiation. What this says is not only are you not likely to do well without surgery if you have a valve problem like this, but also, if you wait too long and you're in one of these more advanced classes of symptoms, you're less likely to make a full recovery and have that really good outcome that we shoot for after we fix your valve. You still have to have it fixed, but your long-term life expectancy and your long-term trajectory might not be as good if you prolong surgery too long after you start to develop symptoms.



This leads us to the next question because most people when they find out they have a valve problem, and even probably for some time after that, aren't symptomatic. What if you're asymptomatic? How do we decide? That's where a multidisciplinary heart valve team comes into play. This is really a hugely important concept.



If you're a patient, you're going to have your primary care doctor. You may have a cardiologist that you've seen regularly. You're going to be monitored. You may have a new diagnosis or maybe you are in surveillance and your heart disease is getting a little worse.

That's the time to bring in a whole team of people, whether that's locally, whether it's seeking a second opinion from me, a comprehensive valve center, but bringing a team of experts that includes perhaps other expert cardiologists who have expertise in specific valve diseases, dedicated cardiovascular imaging specialists who are experts in echocardiograms and MRIs and all of these things, interventional cardiologists who may do procedures – you had some questions about the TAVR procedure or you may have heard of mitral clip, some transcatheter options, or surgeons like myself who are really going to be able to look at multiple imaging modalities, understand all the treatment options and come up with really what's the right plan for each individual patient.

Second Opinions for Heart Valve Disease

Role of a Comprehensive Valve Center

- New Diagnosis
- Change in Valve Severity
- Change in Heart Function
- Change in or New Symptoms
- When Considering Surgery/Intervention

This falls into the realm of getting a second opinion about valve disease. I want to talk about that concept for a minute. Here at Northwestern, we're a referral center. Most of our patients come from outside of our system initially. We see people from all over the country, whether it's virtually, on the phone, in person. This is a role that we fill a lot. One question is what is the role – when is it right to get a second opinion about your valvular heart disease? I think the times are when you have a new diagnosis and you're trying to understand what that diagnosis means.

If there's been a change in your valve function, if you've had mild mitral valve regurgitation for some time and suddenly you get an echo and it says it's severe and you're trying to figure out what to do, certainly if you have a change in your heart function, if your heart looks like it's becoming weaker, we'll talk a lot about this in a second, that's a really important time. If you start to develop symptoms or your symptoms are getting worse, or if anybody is recommending that you have surgery or an intervention, it's always a great time to get a second opinion.

Second Opinions for Heart Valve Disease

“Getting a second opinion”

Does not mean...

“Looking for a new doctor”

When we talk about a second opinion, this is the key point... Getting a second opinion doesn't mean you're looking for a new doctor. It doesn't mean you don't like the opinion that you have. It means you're trying to get the most opinions that you can and the most up to date expert advice. We tell our people, our patients who come to us to seek a second opinion all the time because we really believe that having more expert opinions leads to better decision making and better outcomes.

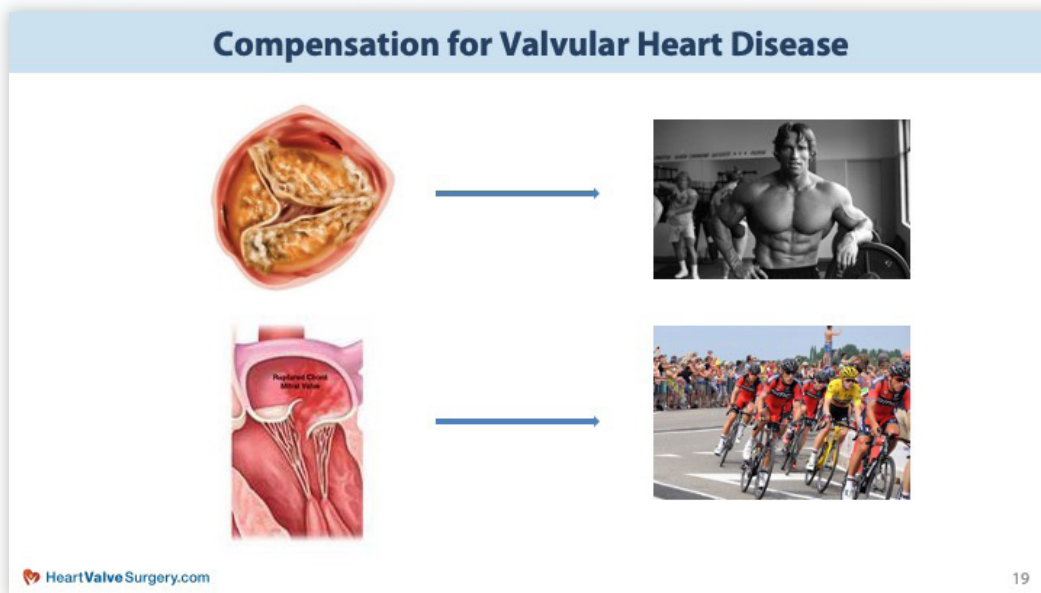
One of the roles that we sometimes fill here is to give a second opinion and give guidance even when we know that a patient may not ultimately have all of their care at a center like Northwestern but we do really think that's an important role that places like this fill is to make sure people have really the right data and advice to go on.

Adam Pick: Dr. Hodges, real quick, as we talked about, we're all about empowerment here for patients. This is really a critical moment, I think, because there is that thought that somebody, a physician might take offense to getting a second opinion. We have some recent data. We did a survey of 100 patients. We asked them the question: "Did you get a second opinion?" 61% of those patients did go ahead and get a second opinion. You are not alone. You're not abnormal if you decide, like Dr. Hodges is saying, to get a second opinion because this is a big deal, right, Dr. Hodges? Heart surgery, it's different than a haircut. I love what you're talking here about getting a second opinion.

Warning Sign #2: Change in Heart Function



Dr. Kevin Hodges: We're out of the range of clear-cut symptomatic valve disease because that's a no brainer. Warning Sign #2 is you have a change in your heart function. This is also a no brainer. We'll talk a little bit about what this means.



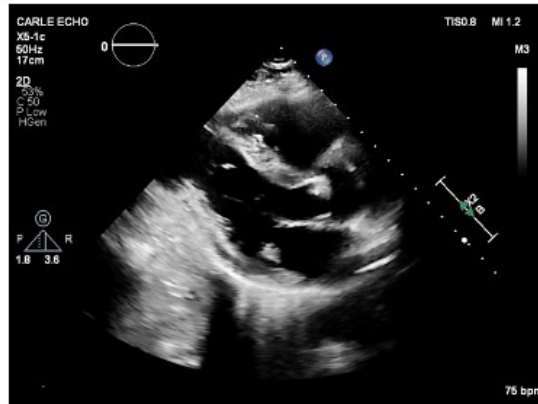
Even if you don't have symptoms, your heart can be feeling the effects of your valve disease. The reason you don't have symptoms is that your heart is compensating.

You have aortic stenosis. Your heart compensates just like any other muscle by bulking up. It gets really strong. Let's see what happens. There it is. That's your heart as it's compensating for severe aortic stenosis. The muscle gets stronger. The muscle gets thicker. The opening of that aortic valve may be very small, even maybe the size of a pin, but the muscle gets strong, it's able to squeeze the blood through it and keep you from having symptoms, even though it's really working very hard.

Let's see the mitral valve. The same thing is through – I don't have a great Arnold Schwarzenegger analogy for this one, but your heart compensates when you have mitral valve regurgitation by pumping more blood with each beat. If a huge amount of that blood is going backwards, the heart has to pump more with each beat so that enough of it is still going forwards. This is my analogy here which is a Lance Armstrong Tour de France biker who's ultra efficient in terms of moving things in the right direction. Let's look a little bit real life what that looks like.

Compensation for Valvular Heart Disease

Left Ventricular Hypertrophy



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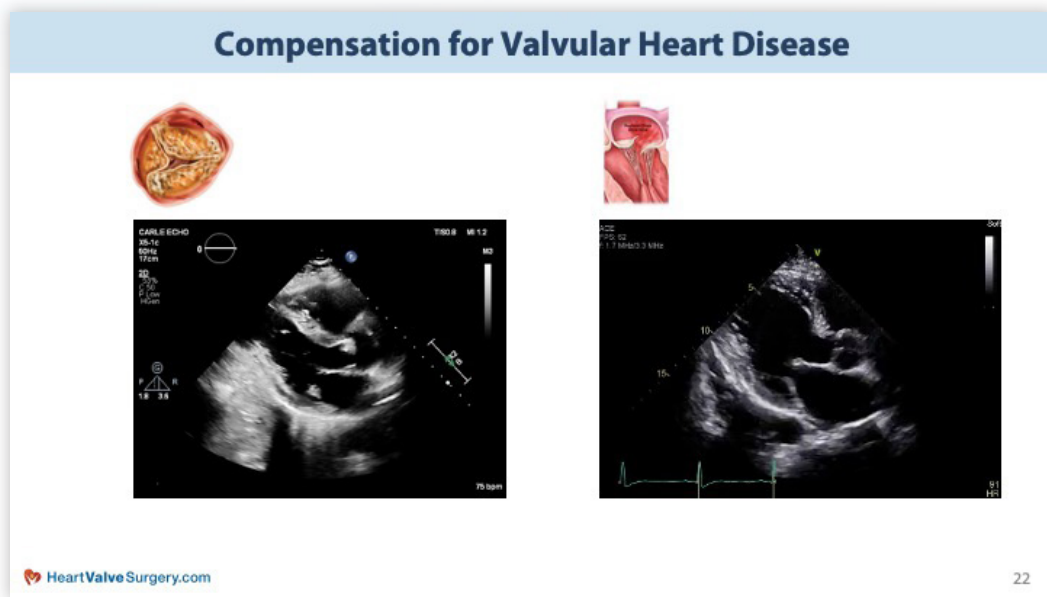
This is a patient who has severe aortic stenosis. Right in the middle, for those of you who may have seen echos... It's not opening and closing much. The left ventricle has adapted to this. The muscle that's squeezing together has gotten very thick. The chamber inside the left ventricle is still relatively small. The heart is squeezing most of the blood out of that ventricle with every beat. This might even be somebody whose ejection fraction is higher than what would normally see. It's a hyperdynamic left ventricle, very thick muscle.

Compensation for Valvular Heart Disease

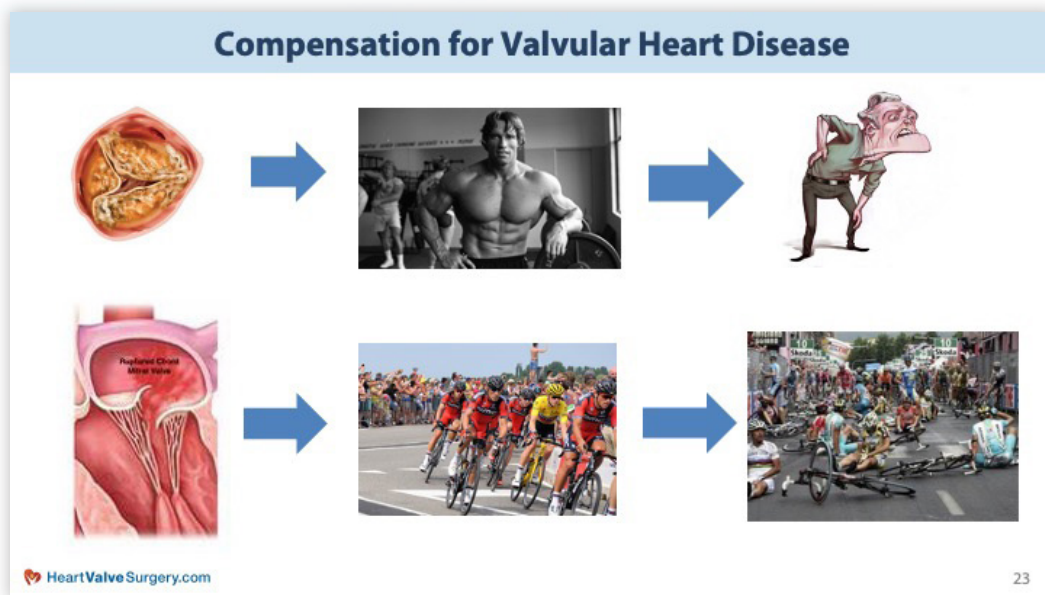
▪ Left Ventricular Dilation



Let's look at a comparison. We'll show a side by side in a minute, but let's look at what happens with a severe mitral valve regurgitation. Down at the bottom opening and closing is the mitral valve. This is a patient with mitral valve prolapse. Those two leaflets don't meet at all so they have, even though we don't have that color, you can tell they have severe mitral valve regurgitation. This ventricle, the muscle thickness is normal, but the ventricular chamber is dilated. The heart is stretching around so that there's more volume in the heart with each beat. As it squeezes, enough of the blood is still going forward, even though a large proportion of it is going backwards into the lung.



Let's look at those two things side by side. I think you'll be able to see the difference. On the left, severe aortic stenosis with a small chamber of the ventricle. Yeah, that's the valve right there. A thick muscle on the right, you have the opposite. You have a big wide-open ventricle that's very dilated to accommodate that leaky mitral valve.



I go back to my cartoons.

The problem is that your heart can't compensate like this forever. Eventually, with all of this work and compensation and straining, this is what happens next. Eventually, you get failure. You run out of steam and then what you can lead to is what you get in this next echo.

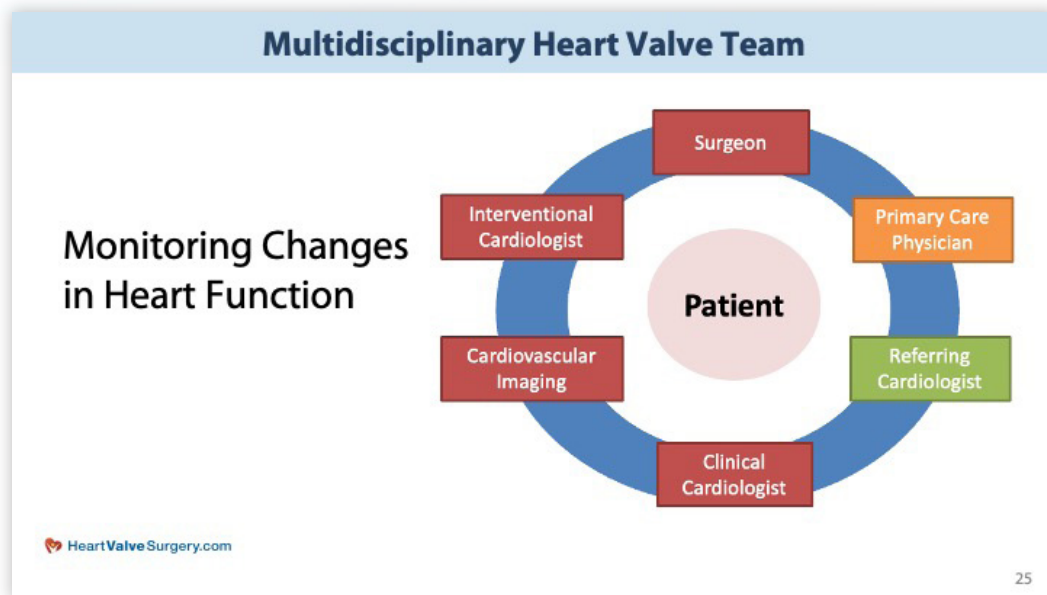
Decompensated Left Ventricle



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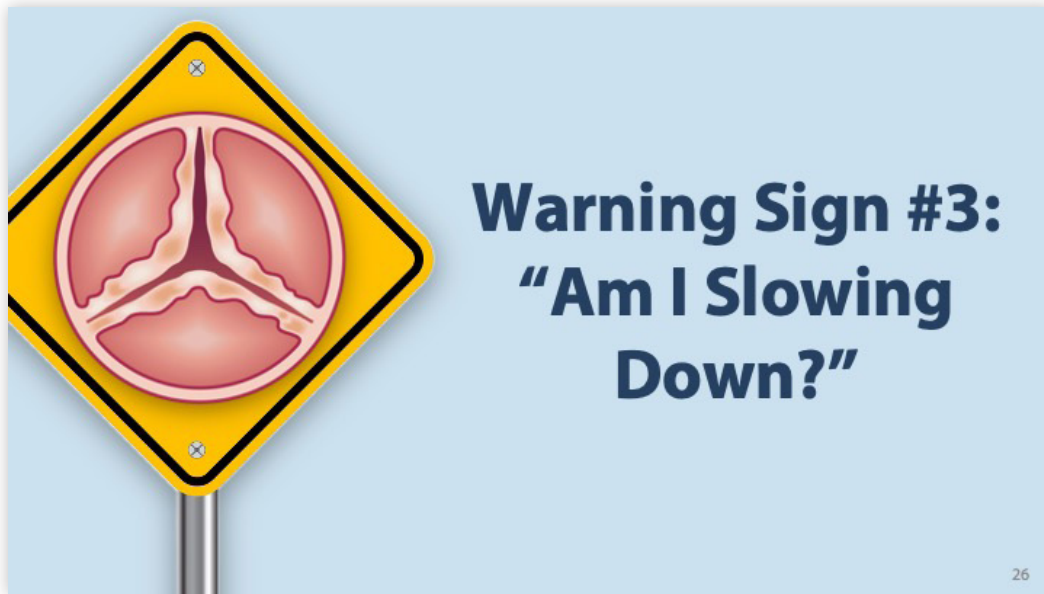
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This, unfortunately, is a patient, actually a patient I operated on, who has severe aortic stenosis that went untreated for a very long time. They have the same bright white calcified aortic valve in the middle. Exactly, yeah. The ventricle, it's no longer thick and squeezing heavily. It's actually run out of steam. It's started to dilate, which is bad aortic stenosis. You really don't see very much movement at all on the left side of the echocardiogram. This is a person whose ejection fraction was about 10%. They came in with bad heart failure and really made for – actually they did very well, but somebody who really was a tricky problem to solve.



This is what we don't wait. Going back to that heart valve team approach, this is where all of these experts come in. If you have a severe valve lesion or severe valve disease and you're not in an immediate operative scenario, and we'll talk a little bit about who are the people we just operated on right away, it's really important that you maintain relationships with these individuals, follow up with regular echo follow-up to make sure that you, when you start to see some of those early changes that we saw in those compensation echos, that you start thinking about a valve intervention. You don't want to wait until you become that last person because your heart, and again, another really insightful question coming up in the Q&A, once you get to that point, your heart is not likely to recover to normal. Even though we can fix the valve, you may never get back on the same trajectory that you started that you would like to get back on to.

Warning Sign #3: Am I Slowing Down?



Dr. Kevin Hodges: That leads us to Warning Sign Number 3. These are patients who don't have clear-cut symptoms. You get an echocardiogram and their ventricular function is normal. They've got a severe valve problem, but they ask you questions like, "Am I slowing down?" This is something that comes up all the time. Let's see.

"I don't have Symptoms but..."

- **"I definitely feel like I am getting older..."**
- **"I do take more naps than I used to..."**
- **"My marathon time was slower than I expected..."**

These are some real comments that we get somewhat often. People say, "Well, I have severe aortic stenosis. I don't really think I have symptoms, but I definitely feel that I'm getting older." Maybe somebody says that. "I'm 65 and I don't feel the way that I did when I was 55, but I don't really think it's heart failure," or "I just notice I take naps in the afternoon now, but I retired and so now I don't have anything else to do so I'm just taking a lot of naps," or in a real patient of mine, a patient went to his primary care doctor because he ran a marathon but he didn't do as well as he did in his last marathon and he said, "There might be something wrong with me."

These are really hard things to tease out. You ask a patient very straightforward, "Do you get short of breath when you exercise?" "No, I don't, but I used to walk every day and now I don't." It's hard. How do we really sort these things out?

Exercise Stress Echocardiogram



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We have some tools. One of the very good tools that we have is something called an exercise stress echocardiogram. This is a test many of you may have experienced this before where you're asked to do exercise on a treadmill. There's a standardized protocol where you start slow and work your way up with increasing levels of strenuousness essentially until you can't exercise anymore. We call that your peak stress. Once you reach that phase, you get an echocardiogram. We're looking for specific things depending on what valve problem you have to understand whether either your valve is worse than we thought it was or maybe the valve is having a bigger impact on you than anybody realized.

Exercise Stress Echocardiogram

- Aortic Stenosis
 - Decreased exercise tolerance
 - Decrease in blood pressure
- Mitral Regurgitation
 - Decreased exercise tolerance
 - Worsening valve function
 - Increased pulmonary artery blood pressure

Let's look a little bit, at least our two poster children, what are the things we're looking for. Let's take aortic stenosis as a first example. The first thing that we're looking for is do you have what we call decreased exercise tolerance. Because it's a standardized exercise protocol, we know on average for people of certain age and gender what would we expect somebody to be able to do on a treadmill, how far into that protocol can they get. Sometimes we're surprised to see that a patient who is supposedly asymptomatic really has a significantly decreased exercise tolerance. That's a big red flag. That's the patient that we talked about before who maybe says, "I don't feel symptoms but I no longer do any of the exercise I used to do." It's a time to say, "Well, hey, maybe this is really the reason why you're not exercising."

It's a good red flag to objectively say, "It's time to think about doing something for your valve." In aortic stenosis, one of the biggest red flags is a decrease in blood pressure with exercise. What happens, you can imagine, if your aortic valve is normally the size of a quarter and maybe it's the size of a dime because you have a severe stenosis, your heart's limited to how much blood it can squeeze out with each beat, even if you're that Arnold Schwarzenegger heart we talked about before, even if all the hypertrophy and strength in the world, it can only pump so much.

When you get on a treadmill, your muscles say, "We need more blood." Those arteries dilate so your heart is being able to supply blood flow to a much larger part of your body than it normally would and it can't keep up. You actually get a decrease in blood pressure. That's a big warning sign that that aortic stenosis is not only getting serious but it's actually dangerous without treatment. When we see that, that's a major indicator that it's time to move forward with a valve intervention.

With mitral valve regurgitation, again, we always look at exercise tolerance relative to peer groups to make sure that we're not missing some symptoms that might have been overlooked, but it's a little bit different what we're looking for in mitral regurgitation. One of the things we're looking for is to see if the valve function gets worse with exercise. Often we have a patient who may be on a resting echo, has what looks like moderate valve regurgitation. The valve's not normal but it doesn't seem to be severe enough to maybe explain some low-level symptoms.

When you exercise, the blood pressure inside of your ventricle goes up. Just like it's fluid leaking through a hole, if you squeeze that fluid harder through the hole, it may leak more. Somebody who says, "Well, boy, I get symptoms when I exercise, but my resting echo looks moderate," if they get in a treadmill and during exercise they have severe mitral regurgitation, then we have our answer. We say, "You know what? Your resting echo doesn't look so bad, but this is really impacting you when you try to exert yourself. It's time to do something." The next thing we look at is actually...

Adam Pick: Dr. Hodges, real quick... I'm sure a lot of other patients are wondering this as well, which is "What percent of your patients get stress echocardiograms before they have surgery?" Because I didn't have one. I was just told, "Hey, look, you've got to get a surgery as soon as possible."

Dr. Kevin Hodges: Yeah, it's variable. I bet it's a quarter or maybe a little less. A lot of times, between all these other things we're going to talk about this evening, we've got the answer that we need. A patient with symptoms, a patient with decreased left ventricular function, or we'll talk about at the very end, a patient who's very low risk for surgery in terms of complications, you don't really need this extra data to know that surgery is the right thing to do, but there's a lot of patients who fall, I would say, a substantial minority of patients who fall onto this gray area where you're not sure what to do. These are tests that help figure that out.

Certainly not everybody needs this, but when you're a little uncertain what to do or – one instance that comes up, I like to think everybody wants to see me in the office, but I understand that maybe nobody is excited about the prospect of a heart operation. Sometimes people come in and say, "Hey, I want to wait six months. Do you think that's safe?" This is a great tool to say, "Well, let's put you on a treadmill. Let's see how you do. If everything looks fine, the chance of developing a complication over the next six months is pretty low." If you get on a treadmill and things don't look good, then we need to have a more serious conversation about doing something sooner. That's another good time to do a test like this.

Blood Tests – Serum BNP and NT-BNP



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- Serum BNP level
 - Hormone released by the left ventricle in response to:
 - Stretching
 - Increased stress
 - Commonly used to track patients with heart failure
- Some asymptomatic patients with severe aortic stenosis have ↑BNP
- Patients with severe AS and elevated BNP have:
 - Higher chance of developing symptoms
 - Higher rates of complications without treatment

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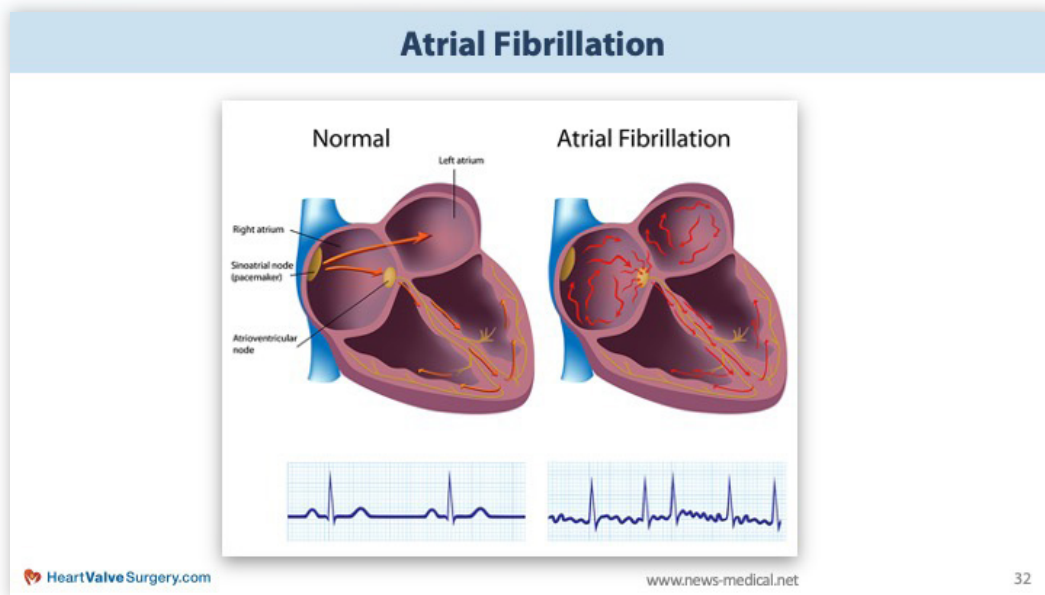
Dr. Kevin Hodges: The other one is a blood test. I want to talk about this specifically in relation to aortic valve stenosis. That's something called a serum BNP level. BNP is a hormone that is released by the left ventricle. It's released when that heart muscle is stretched or experience increased stress. The main thing we use it for clinically is actually to track symptoms on heart failure patients. A patient comes in the emergency room and they're short of breath and we're trying to figure out is this from the heart or some other organ, we can check this blood level and it gives us some sense if the heart is being pushed beyond its limits.

What we're realizing is, especially in patients with aortic stenosis who are asymptomatic, there's a subset of patients where this hormone is elevated. It's a marker that the heart is working harder than it should be. As we're deciding, is it time to do an early surgery for a patient with aortic stenosis, if that lab test is elevated, then those patients have a higher chance of progressing to that symptomatic phase in the very near future and they have a higher rate of complications without having their valve treated. Especially in that patient population, this is being ordered and utilized regularly. You may see this. You may be asked to have this blood test drawn to help determine are we at that stage or not.

Warning Sign #4: New Atrial Fibrillation



Dr. Kevin Hodges: This “Warning Sign” is a little bit of a different one but something that’s a little bit near-and-dear to my heart, which is the onset of new atrial fibrillation. Atrial fibrillation is an abnormal heart rhythm. I think if you turn on any TV station right now, there’s a lot of television ads that are about atrial fibrillation. It’s getting a lot of press lately.

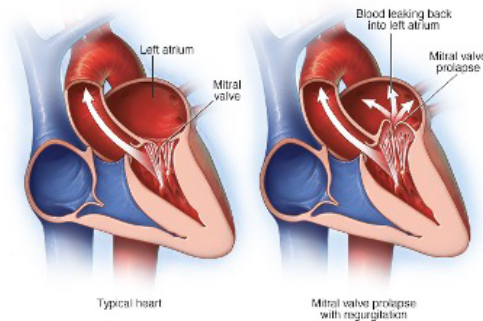


What atrial fibrillation is essentially an abnormal heart rhythm where instead of electrical activity moving from the heart's internal pacemaker, you can call it, called the sinoatrial node, through the upper chamber or the atrium of the heart to the ventricles in a coordinated manner, the electrical activity in those upper chambers or atrium is what we call disorganized.

It's shown on the right here, these arrows moving all over the place. What you get is a couple of things. You get first an abnormal EKG shown at the bottom. You may have symptoms of heart palpitations. Sometimes people get a very rapid heart rate. In some cases, they can even lead to heart failure or pretty significant symptoms.

Heart Valve Disease and Atrial Fibrillation

- Aortic and Mitral Valve disease causes stretching of the left atrium
- Stretching leads to scar (fibrosis) that disrupts normal electrical activity
- Atrial Fibrillation can indicate advanced valve disease



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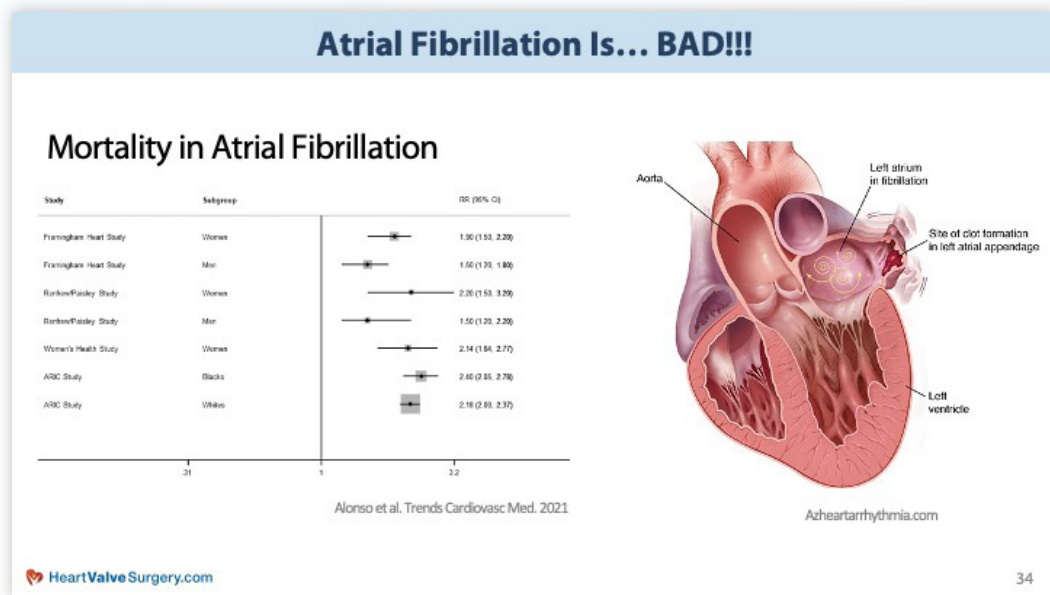
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This is something that is very frequently associated with valvular heart disease. The classic example of this, the best one that's easiest to understand is with mitral valve regurgitation, the pictures on the bottom show two hearts. One if with the mitral valve on the left that looks normally, there's two leaflets that are pointing down attached to the strings that are attached to the ventricle. Those leaflets are meeting in the middle. If you show on the left one, that's the normal, yeah. They're meeting in the middle and there's no leakage.

On the right, you see mitral valve prolapse. Those two leaflets are filling upwards into the atrium and blood is able to leak out in between them. That leaky blood stretches out the muscle on the left atrium. Anybody who's been seen for mitral

regurgitation likely has seen some indication in the echo report that they have an enlarged left atrium. That's from the volume and pressure building up in the atrium stretching that out.

That also leads to formation of fibrosis and scarring in the atrium that disrupts the normal electrical activity of the atrium and can lead to atrial fibrillation. The first thing that atrial fibrillation tells us in a valve disease patient is that that valve disease is pretty significant. In order to get to that stage for the atrium to stretch out to develop atrial fibrillation, it needs to be a pretty significant valve problem. That tells us that it's severe and it's impacting the heart in a negative way.



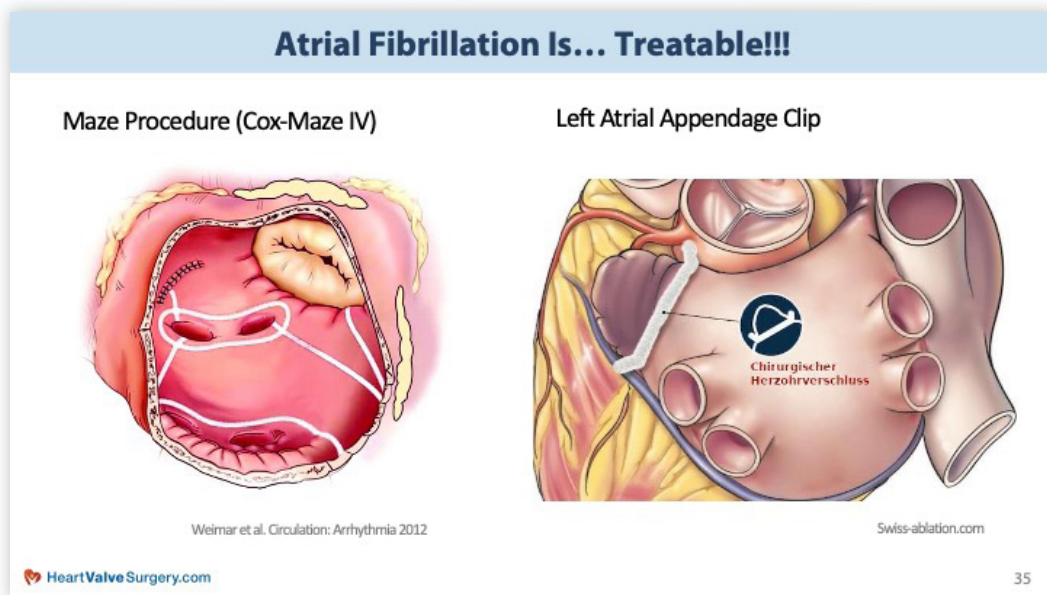
The other important thing to know, and this is very simply put, is that atrial fibrillation is bad. Every study that's ever looked at populations of patients and compared patients with atrial fibrillation to patients without atrial fibrillation has found that even the life expectancy of patients with atrial fibrillation is reduced. Patients have more heart failure, more strokes. It's a really bad actor.

We don't need to go into it, but this chart on the left side, this is a list of big population based studies looking at people with heart disease comparing patients with or without afib and the fact that all these black lines and diamonds and gray boxes and things are all clustered on the right side of that graph means that in every study they found that atrial fibrillation is associated with

worse long-term survival. That's a really big deal.

On the right, we've got another important thing about atrial fibrillation which is that atrial fibrillation is associated with blood clots in the heart and strokes. Because the blood isn't squeezed out of the atrium in a coordinated fashion, that blood can be stagnant. It can pool, especially in something called your left atrial appendage. It can form blood clots. That's what's shown in this cartoon. If that clots breaks loose, it can travel through the mitral valve into the left ventricle out the aortic valve and into your bloodstream, go to your brain and cause a stroke.

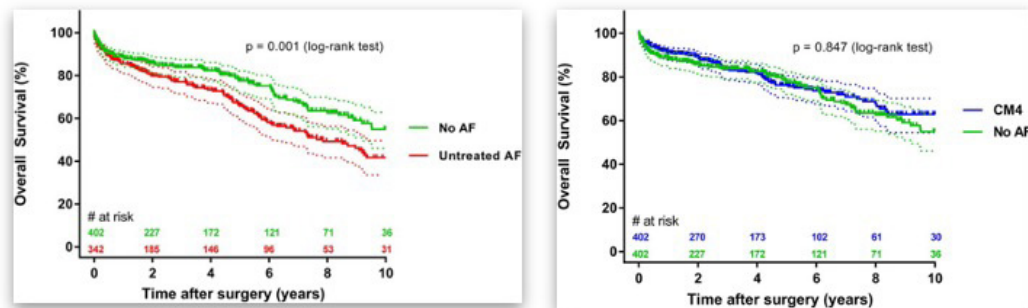
That's why many people who have been diagnosed with atrial fibrillation are asked to take blood thinners potentially for the rest of your life. You've got something that is associated with bad outcomes, potentially strokes, and important lifestyle problems where people are required to take medications including blood thinners. Overall, this is a bad actor if this comes on in the setting of valve disease.



There is good news and that is that atrial fibrillation is treatable. Now, treatment of afib is an entire topic that we could probably spend an hour or more in a separate discussion on, but the important thing to know is that there's a surgical procedure called the Maze procedure which is actually the most effective type of ablation procedure we have in terms of eliminating atrial fibrillation. A Maze procedure has an 80% to 90% chance of curing afib once and for all and it's very easy to add that to a valve operation. In fact, it doesn't significant add to the risk of the operation. In fact, it seems to potentially even make it a little bit safer and it can be done without really complicating what we're doing if we're going to be operating for a valve anyway.

The other thing that the Maze procedure involves is closing off the left atrial appendage. The cartoon on the right has this white angle thing as a representation of what we call left atrial appendage clip. What we do with that is place it in a way to keep blood from moving in and out of the left atrial appendage. That's the spot where blood clots form most commonly if you have afib. If blood can't get in and out of that appendage, it can't form a clot there and it can't lead to a stroke. It doesn't eliminate the risk of stroke, but it significantly reduces that risk. There's more and more data coming out that just doing this improves people's outcomes when they have afib.

Treating Atrial Fibrillation Improves Outcomes



Musharbash et al. JTCVS 2018

This slide, I apologize for two graphs here but I think it makes a really important point. This is to show that treating afib during your valve surgery improves your long-term outcome. This is a really good study that came out of Washington University in St. Louis all the way back in 2018, about five or six years ago now. On the left we have these red and green lines. This is, again, starting all the way on the left, that's at the time of somebody's heart surgery, and going toward the right is over the course of time after ten years. It's looking at the percentage of people who are still alive after their heart surgery.

Now, by the way, this reminds me of a question that we sometimes get in surgery which is, "If I have valve surgery, does that mean I only have 50% chance of being alive at ten years?" No, it doesn't mean that. You have to remember that a lot of people who have valve surgery are having valve surgery later in life where their chance of being alive ten years may be 50% anyway. The not having surgery lines look a lot like this. I want to emphasize that. I've been asked that question before and I think it's a common myth that if you have heart surgery, you're not going to live very long.

That's not true, but the point of these graphs is that patients who come into the hospital, have valve surgery, who've never had any history of afib, have an expected post operative trajectory. Patients who have heart surgery where they have afib that was ignored actually live short – so they have much worse outcomes. That shows us that afib over time is really a detriment to patients, but if you look on the right, this shows that same green line is exactly the same. Patients who had heart surgery who didn't have afib, they did great. The good news is, if you do a Maze procedure like we showed on the last slide, the new line, that's the blue line, people have heart surgery who had a Maze procedure, is identical to the green line, identical from a statistical standpoint, even though they wiggle in and out of each other.

Treating your afib, if you're a patient that has mitral regurgitation, you develop afib, it's a bad problem, but if you have your valve fixed, you have a Maze operation, it puts you right back on that normal trajectory the same as if you had never developed afib in the first place. Again, a little bit busy and I apologize for the statistics here, but I think it's a really important point that, one, afib means you have a severe valve problem, two, if you have a severe valve problem and you have afib, you need to get your valve fixed and you need to have your afib treated because that combination of things is what's going to put you back on normal trajectory. There's a whole other slide under treated of atrial fibrillation heart surgery. I would just put a little public service announcement. If you have a valve problem and you're talking to someone about that and you have afib, please ask them what they're going to do for your afib. That's a really, really important point.

Adam Pick: Dr. Hodges, this is something that we have been working on a lot. It's getting awareness up to these therapies, whether it's a Maze procedure or a left atrial appendage closure, to help patients. I just want to make sure we have this question from Robin on this specific topic. I'm curious. She says, "Can you fix afib at the same time as the valve if you are doing an open-heart surgery?"

Dr. Kevin Hodges: Absolutely, so if you go back, can you go back to the last slide? These are surgical cartoons, but if you looks at the one on the left, that beige thing down in there is the mitral valve. Adam, can you hover over? Yeah, there you go. That's the mitral valve. This is the exact exposure that I use during open heart surgery to repair somebody's mitral valve. The white lines are meant to represent the lines of scar. I didn't go into a lot of detail on what the Maze procedure is but I can. Those are the lines of scar that we make in the muscle to try to cure the afib.

What the Maze procedure is, it's actually named after a maze in a children's coloring book. It's a line of scars that go throughout the left atrium that disrupt all the known areas where atrial fibrillation comes from, but it also creates a path, a so-called maze, for the normal electrical activity of the heart to make its way from the atrium to the ventricle. It preserves the normal electrical activity but disrupts the abnormal. As you see here, especially for mitral valve surgery but for really any surgery, it's very easy to add that because we're working in that area anyway.

If you look at, I mean, there's tons of data on this, we could spend an hour easily, if you look at surgeons in their approach of treating afib, people that do a lot of mitral valve surgery, we're really good at this because we're used to working in that area of the heart. If you have a mitral valve repair and you have afib, 90% of the time anywhere in the country, somebody is going to address your afib. I think the area where we're working on awareness is for other operations, for aortic valve surgery, for coronary bypass surgery, making sure that people are recognizing that this is a bad problem, and you have a unique opportunity to address that at the time of heart surgery and really improve patients' long-term outcomes.

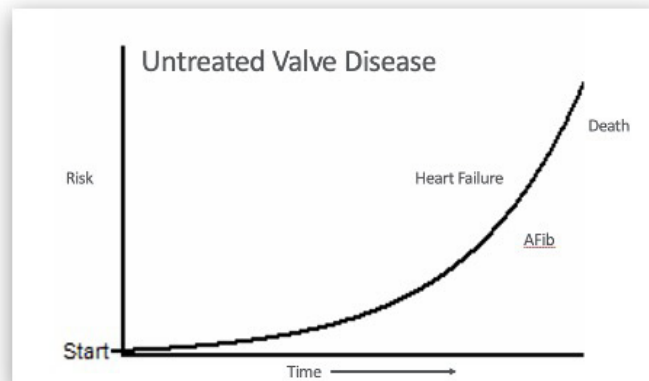
Warning Sign #5: Severe Valve Disease and Low Surgical Risk



Dr. Kevin Hodges: So the last Warning Sign, and this one we're actually probably going to spend the most time on because it's probably the most complicated, most data is that if you are a patient who has a severe valve problem and you're low risk for complications during surgery.

Risk Benefit Ratio

- Lower Risk Favors Earlier Intervention



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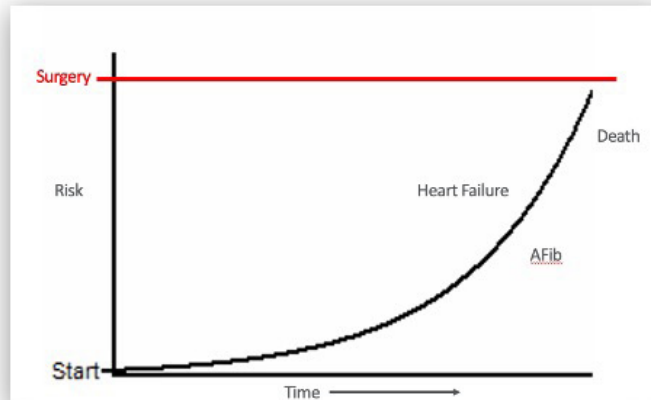
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To understand this, I want to look at this graph. Again, a little bit homemade, so I apologize, which is the concept that timing of treating valve diseases is a risk-benefit calculation. So over time, if you, not ignore but if you're in a watchful waiting period and you're treating valve disease with medicine, your chance of developing complications goes up. Those complications are things like atrial fibrillation, heart failure, or even death. So the longer you wait, the longer chance you have of developing that problem.

Then the decision to proceed with surgery is a comparison, essentially, of the risk of an operation versus the risk of developing a serious complication by not having surgery.

Risk Benefit Ratio

- Lower Risk Favors Earlier Intervention



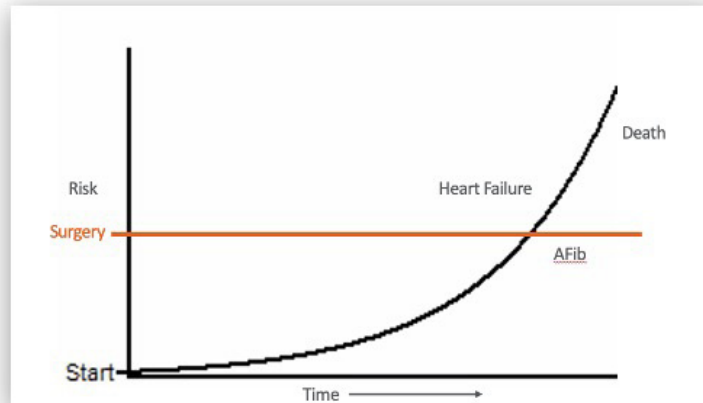
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So, this would be somebody who is high risk for surgical complications. The risk with surgery is way up at the top of the graph. These lines, they never cross because in this hypothetical patient, let's say somebody's a hundred years old and they have renal failure. There's no way the risk of surgery is going to be lower than the risk of continuing to treat with medicines, and it may be the case that we wait until the very end of this path, or maybe surgery never makes sense at all.

Risk Benefit Ratio

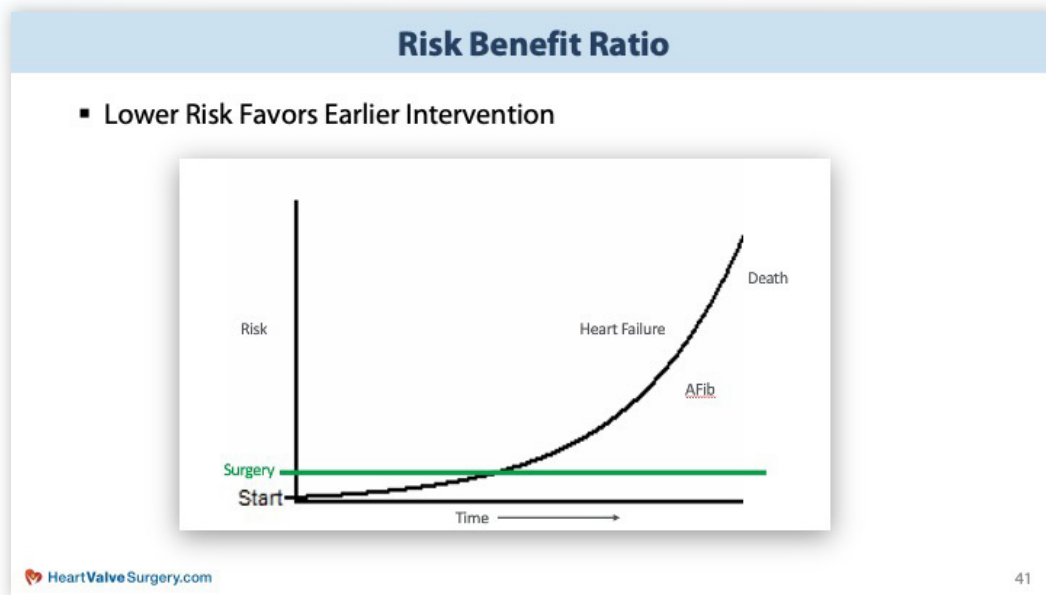
- Lower Risk Favors Earlier Intervention



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Here you see somebody who is maybe a medium surgical risk. Maybe they have a couple comorbidities; maybe they're not so healthy; maybe they've had previous operations. This may be somebody that we know we're going to need to operate because we expect them to have a long life and we need to do something, but maybe we wait until they actually start to develop some of those symptoms. We want to know that they're actually going down that path before we subject them to an operation that may carry some real substantial risk.

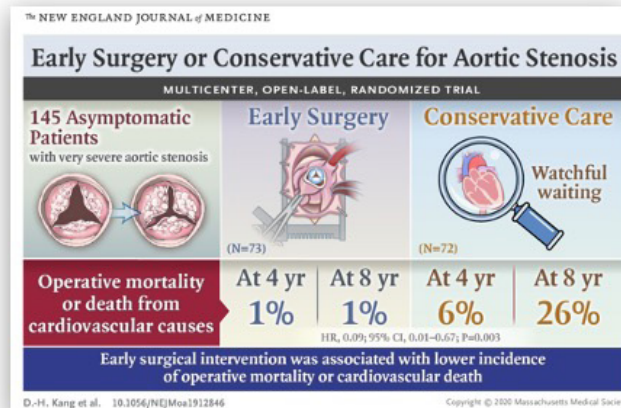


Then, the last category is somebody who is low-risk, and actually I suspect that a large portion of the people on this webinar probably fall into this category because for isolated valve surgery, most people are actually pretty low risk. These are people that we know that they have a severe valve problem. If it goes untreated, eventually, they will develop problems, but they may be way in the future. The risk of surgery is very low. For us, low risk is risk of complications, death, stroke, renal failure, serious things less than 1%. If you are in that category, there's growing evidence that we'll go through in the next few slides that fixing your valve proactively actually improves your long-term outcomes because you never have a chance to develop any of those things.

As much as we can treat afib with the Maze procedure or we can get you through an operation and you'll do well, it'll never be as good as if those things never occurred in the first place. For people who are low risk where we think we can do a really good job surgically, the field is moving more and more toward a proactive, early approach to valve surgery.

Early Surgery for Aortic Stenosis

RECOVERY Trial



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So, this figure comes from the New England Journal of Medicine. It's from a trial for patients with aortic valve stenosis. In this case, it was patients with what they call very severe aortic stenosis. One of the ways this is measured is actually how fast the blood is flowing through the aortic valve, the velocity of blood flow, and you don't need to know these numbers but to put it in perspective, the threshold for severe aortic stenosis is 4 meters per second. These are people with 5 meters per second, so they're even a little beyond the normal threshold for severe, but they were asymptomatic. Even if there was a question, they made them do an exercise, stress echo, to prove they were asymptomatic, so truly asymptomatic patients.

They randomly assigned them to either early surgery at the time of diagnosis or what they called conservative care. That is waiting for traditional indication symptoms or declining left ventricular function. Then they followed them for four years and eight years and they said, what is the chance of death either from surgery or from your valve disease.

If you look at these numbers, they're really, really striking. The early surgery group did way better. At four years and eight years, the chance of death in some way related to that aortic valve disease was only 1%. The people that were watch and waited, it was 6% at four years and 26% at eight years, so a really dramatic difference.

This has pushed us, I think, pretty strongly toward offering early surgery to people. If you come to my clinic and you have aortic valve stenosis and it's significant, even if you don't have symptoms, if you're low risk for surgery, somebody – especially if it's a minimally invasive operation, this is somebody that we're going to have a very serious conversation about having valve replacement because we know over the next really not that long, they're going to have much better outcomes.

Early Surgery for Mitral Regurgitation

Asymptomatic degenerative mitral regurgitation repair: Validating guidelines for early intervention

Anand Desai, MD,^a James D. Thomas, MD,^b Robert O. Bonow, MD,^b Jane Kruse, BSN,^a
Adin-Cristian Andrei, PhD,^c James L. Cox, MD,^a and Patrick M. McCarthy, MD^a

- Long-term survival after mitral valve repair is worse when:
 - Patients develop symptoms (NYHA Class >1)
 - Patients have decreased heart function (LV EF < 60%)
- Risk of isolated MV Repair is very low
- Repair rate and durability are excellent

Let's look at little bit at mitral valve regurgitation and we'll dwell on that a little bit here. This is a research project that was done here at Northwestern. It was headed by my friend and colleague, Dr. Patrick McCarthy, looking at the outcomes of mitral valve repair here at Northwestern; it was hundreds of patients. What this study showed – we don't have to look at any graphs because they're really busy – is that long-term survival after mitral valve repair is actually worse if you wait for patients to develop symptoms or if they have a decreased ejection fraction or decreased heart function at the time of their operation. We kind of touched on this before. Historically, the recommendation was to wait for one of these two things before doing mitral valve surgery. What we've learned over the last several years is that actually people do better in the long-term if we're more proactive. So if you're asymptomatic, we don't have these things and you're a reasonable surgical risk, it makes sense to get your valve fixed. The other thing that this study showed – I'll show you a figure in a little bit – is that the risk of these operations is extremely low and that the chance of having a good, durable repair is excellent.

Early Surgery for Mitral Regurgitation

2a	B-NR	<p>4. In asymptomatic patients with severe primary MR and normal LV systolic function (LVEF $\geq 60\%$ and LVESD ≤ 40 mm) (Stage C1), mitral valve repair is reasonable when the likelihood of a successful and durable repair without residual MR is $>95\%$ with an expected mortality rate of $<1\%$, when it can be performed at a Primary or Comprehensive Valve Center.^{4,13,16}</p>
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I said I wasn't going to show all the guidelines, and I just want to show this one. This is in the latest iteration of the American Heart Association valve guidelines. It just shows that this has finally made it to the point where there's a consensus on early intervention for mitral valve repair. What it says is in asymptomatic patients with severe primary mitral regurgitation – that primary mitral regurgitation means mitral valve prolapse – and normal left ventricular function, mitral valve repair is reasonable when the likelihood of a successful and durable repair without residual regurgitation is greater than 95% with an expected mortality rate of less than 1% – so that's that low risk we talked about – when it can be performed at a Primary Comprehensive Valve Center. So there's a lot to unpack here, but the key point is asymptomatic patient with a normal heart function who's low risk for surgery where you can get a good, durable repair, it makes sense to operate early rather than wait for some of those traditional things.

Importance of Durable Valve Repair

- For Mitral Regurgitation due to Prolapse

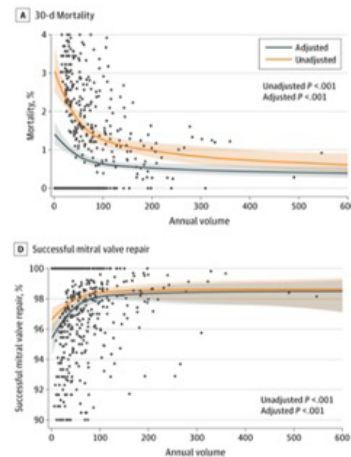


The point of this slide is to say that if you have mitral valve prolapse, you really want to repair, not a replacement. Replacements are great for certain people. Repair means great durability, hopefully one operation in your lifetime, no blood thinners, and lower risk of infection.

Experience Matters

Hospital and Surgeon Volume Predict Outcomes for Mitral Valve Surgery

- Most Centers perform fewer than 100 Mitral Valve Operations per Year
- Higher Mitral Valve Surgery Volume is associated with:
 - More likely to attempt repair
 - More likely to have a successful repair
 - Lower chance of complications or death



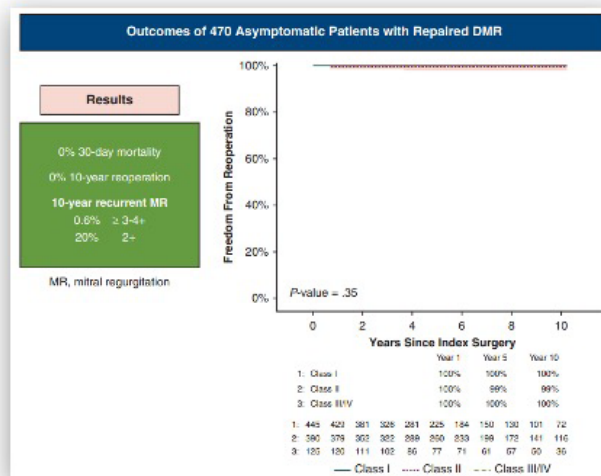
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This slide is to point out that mitral valve surgery ought to be performed at a center that does a lot of it. There's a ton of data to show that most centers in the United States are doing fewer than 100 mitral valve repair operations a year. If you do less than 100, 200 cases a year, your chance of having a high operative mortality rate and a low valve repair rate are much higher, and there's a big step-off. If you look at the graphs on the right, you can see that the slope of these lines – that's kind of what we're looking at – really changes dramatically in between 100 to 200 cases annually. It makes sense. Experience is the biggest thing that guides good outcomes in mitral valve surgery.

Valve Centers of Excellence

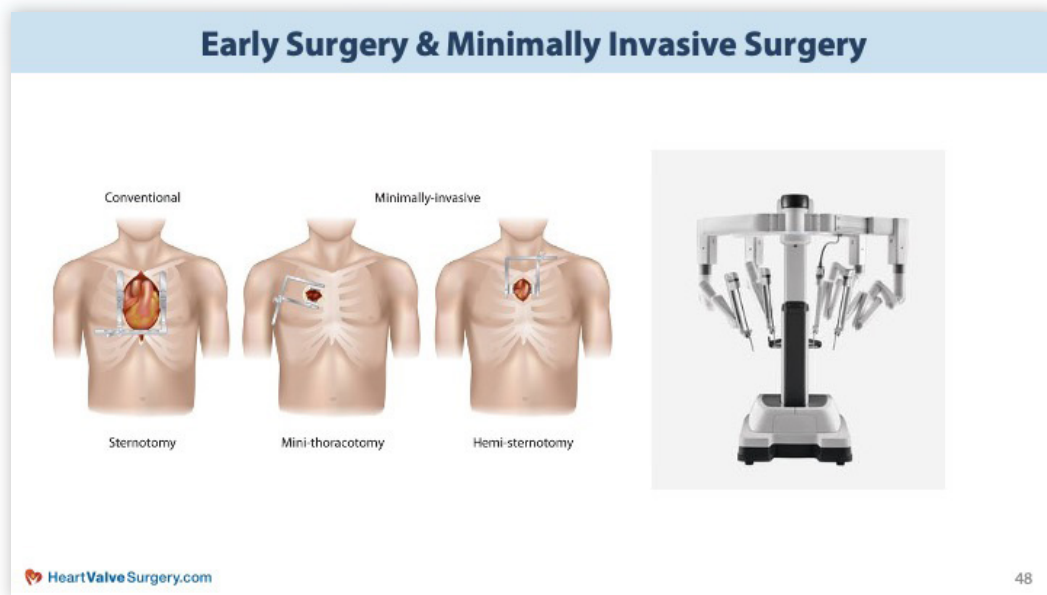
Northwestern Medicine Mitral Valve Repair Outcomes



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This slide is to highlight our outcomes because I'm really proud of them. It's from that same paper, but it shows what a mitral valve center of excellence really looks like. These are people who were asymptomatic. These are the early surgery patients who had mitral valve repair at Northwestern. The operative mortality rate, 0%. The chance of needing a re-operation for your mitral valve within ten years, 0%. The chance of having worse than moderate mitral regurgitation sometime within that ten years is only 0.6%. I'm super proud of what we do at Northwestern. I'd be lying if I said we're the only center with these outcomes. I think we're really, really good. The point is that a mitral valve center of excellence, a high-volume center, is where you want to have your mitral valve surgery.



The other really important thing to touch on is that if you come early for surgery and you don't have these other problems, you haven't developed afib, you're not in heart failure, your ventricle is working well, you have a much higher chance of having a minimally invasive operation.

We can do operations for valve disease that doesn't go through the breastbone, that goes between ribs or is a robotic operation where the recovery time is closer to two weeks instead of the normal six weeks that we quote for a traditional heart surgery. As we talked before we got going in earnest, we only do that if we don't compromise on safety. The more other things come up, the more patients percent with heart failure, the more they have concomitant problems, the less likely we can really do this safely. So early surgery gives you a better chance of a minimally invasive operation and a short recovery.

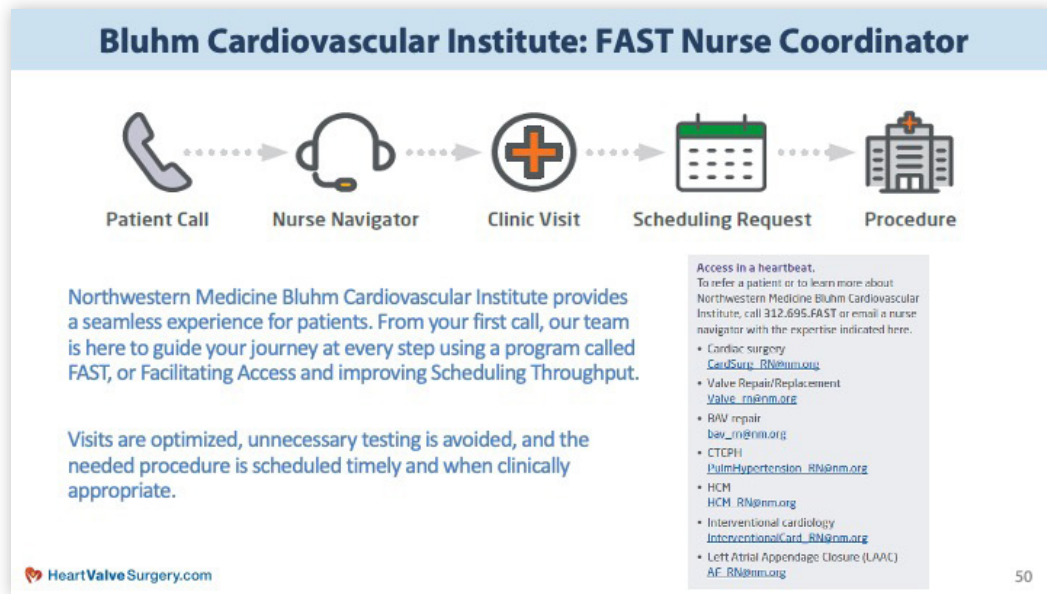
Recovery After Minimally Invasive Valve Surgery

Robotic Mitral Repair, Mini-Thoracotomy Aortic Valve Surgery

- Hospital Stay 3-4 Days
- Lifting restriction < 20 lbs. for 2 weeks
- Resume all normal activity (and work) in 2 weeks


Dr. Kevin Hodges: I just wanted to highlight – this is exactly what I said. This is what we tell people for a robotic mitral valve repair or a mini-thoracotomy aortic valve surgery. They should expect three to four days in the hospital; don't lift anything heavier than 20 pounds for two weeks. Don't drive a car when you're taking narcotics; that's important. Otherwise, you can go back to your normal life in two weeks. Now, you'll be sore, alright? I don't want to oversell it. You'll be a little sore, but you can get on the golf course; you can exercise; you can lift weights; you can do work around the house; you can go back to work. That's a big deal compared to what people are used to thinking about with heart surgery.

New FAST Nurse Coordinator



Dr. Kevin Hodges: This is something that we're really excited about, which is a fast access program for Northwestern that if people have questions, and we know people have questions, if they want a second opinion, or even just to see what we're about, this gets you in contact with a dedicated nurse within 24 to 48 hours of reaching out. Usually you can talk to myself, one of my colleagues in surgery, or whoever the right person is. We try to make an appointment available within the first one to two weeks of reaching out to us. We realize it's sometimes hard to get appointments places, and we want to do what we can to be available for patients.

Questions and Answers

 HeartValveSurgery.com

Warning Signs for Reoperative Patients

**LIFETIME
MANAGEMENT
OF HEART
VALVE DISEASE**

Adam asks, “Many patients in our community have already had a primary procedure... Are there different signs for patients who already had a valve replacement or valve repair that is now failing?”

Roberto asks, “What about paravalvular leak?”

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Adam Pick: Dr. Hodges, we’re going to rapid fire “Q & A” with you. Let’s get started. My question to get this going, many patients in our community have already had a primary procedure. We got folks who are newly diagnosed but a lot of folks are in that watchful waiting in the re-operative stage. Are there different signs for patients who already had a valve replacement or a valve repair that is now failing? Roberto asks what about paravalvular leak?

Dr. Kevin Hodges: Yeah, great questions. So the signs aren't really different but it does point a little bit to the risk-benefit issue that we talked about before. In certain cases, a re-operation is riskier than a primary operation. Sometimes it's not but it can be. We have to weigh those things. Often times, we're more inclined to wait a little bit if we're going to re-operate and do open heart surgery again for a valve than a really early proactive operation, but that's not always the case and every patient is a little different.

The other thing that paravalvular leak gets at is there are often transcatheter options that are better suited to patients that have already had an operation than patients the first time. So a lot of times, paravalvular leaks can be fixed transcatheter therapy, or you can have what's called a valve-in-valve operation where a valve can replace a second time inside of a surgical heart valve. There's a lot of growing experience with that, and it's often a very good option.


Richard asks, “I was recently diagnosed with moderate mitral regurgitation. Can I still exercise – run, pickleball, yoga - while I’m in the waiting room?”




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Adam Pick: Richard asks, “I was recently diagnosed with moderate mitral regurgitation. Can I still exercise, run, pickleball, yoga, while I’m in the waiting room?”

Dr. Kevin Hodges: Absolutely, and I would encourage it. Like anything, pay attention to how you feel. If you feel like your exercise tolerance is decreasing or you get short of breath, talk to your cardiologist and get an echo to see if something’s changed. I absolutely would encourage being as active as you can be.

 HeartValveSurgery.com

Heart Failure



Susan asks, “What percentage of people with heart valve disease develop congestive heart failure?”

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Adam Pick: Moving over to Susan, she asks, “What percentage of people with heart valve disease develop congestive heart failure?”

Dr. Kevin Hodges: This is the hardest one because we don’t really know. We don’t know what number of people are walking around with undiagnosed mild to moderate valve disease. We don’t know in a math perspective the denominator. To put it in some perspective, something like 2 to 3% of the population has mitral valve prolapse. When you think about that, I mean, that’s a huge number of people. Very few of them will go on to develop congestive heart failure and ideally, we treat them all before they get to that point, so maybe none. It’s actually a very small percentage of people who maybe have mild valve disease on an echocardiogram will ever go on to develop heart failure.

HeartValveSurgery.com
Clinical Trial for Aortic Stenosis


Jane asks, “What can you tell us about the EVOID Clinical Trial for aortic stenosis? Is it possible Evogliptin can help with calcium aortic stenosis prior to surgery?”

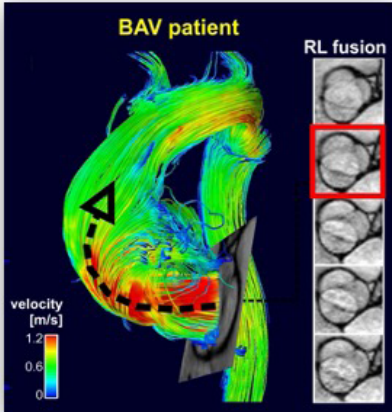


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Adam Pick: This is a very interesting question from Jane, who asks, “What can you tell us about the EVOID clinical trial for aortic stenosis? Is it possible that Evogliptin can help with calcium aortic stenosis prior to surgery?”

Dr. Kevin Hodges: Yeah, Evogliptin is a diabetes medication. It’s being studied in a big trial to see if it reduces the progression of aortic stenosis, if it reduces how much calcium builds up in your valve over time. They’re looking at people with not severe but mild to moderate aortic stenosis and seeing if it makes a difference. There’s been a lot of trials like this over the year with different agents, different approaches to see what might work. I don’t know. To be honest, I don’t know where things stand from a data collection standpoint in that particular trial. I do know that so far, we haven’t found a really good Holy Grail for preventing the progression of valve disease. Even as a surgeon, I can acknowledge that if we can halt the progression of these things and prevent people from needing surgery, that would be the best case.

 HeartValveSurgery.com
Diagnostic Tests



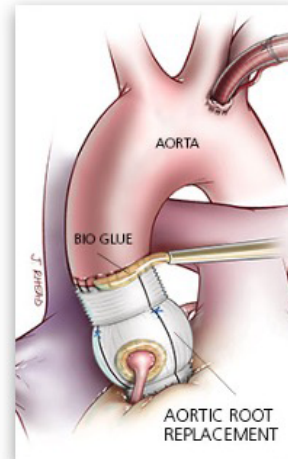
Evan asks, “How would a patient know if the echo being done uses the latest technology? How do I know if the technician is good? Does that matter?”

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Adam Pick: Evan asks, “How would a patient know if the echo being done uses the latest technology? How do I know if the technician is good? Does that matter?”

Dr. Kevin Hodges: Yeah, this is a good question. So good technicians, good cardiologists that are used to reading echocardiograms, that’s all very important. The American Society of Echocardiographers has some resources about echo lab accreditation and that’s one resource. I think just like with surgery, you want to be at a center that does a lot of valve echos, and you want a cardiologist who has seen a lot of valve echos to really know the subtleties of these things.


John asks, “Hi Adam, Can a valve sparing aortic root aneurysm repair (and aortic valve repair) be done through a mini-thoracotomy? I see mention of it being done through a mini-sternotomy but that seems to be the only minimally invasive approach I can find.”



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Adam Pick: John asks, “Hi, Adam. Can a valve-sparing aortic root aneurysm repair and aortic valve repair be done through a mini-thoracotomy?”

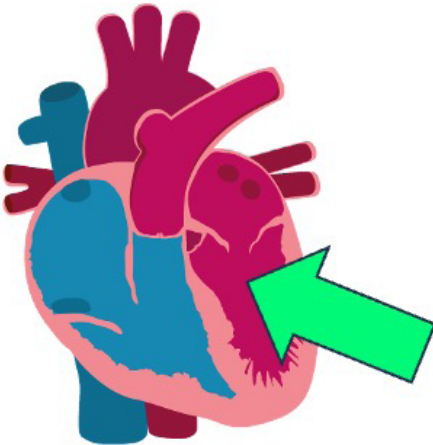
Dr. Kevin Hodges: Yeah, people talk about it. I’ve seen videos of it. I think they’re probably highly selected patients. Our approach would not be to do this operation through a mini-thoracotomy. Personally, again, I only speak for myself and our practice here, I think that we would be compromising on some of the safety to do such a – it’s a big operation. It’s a fun operation; I like to do it and we have great results. I don’t think I’d be being honest if I said I could do it through a mini-thoracotomy with the same safety and outcomes as I could through a full sternotomy or even a partial sternotomy.


Left Ventricle Remodeling

Mehrab asks:

How common is it among the patients to have reduced LVEF% after valve surgery and what are the chances to recover or have increased LVEF as part of the recovery process?

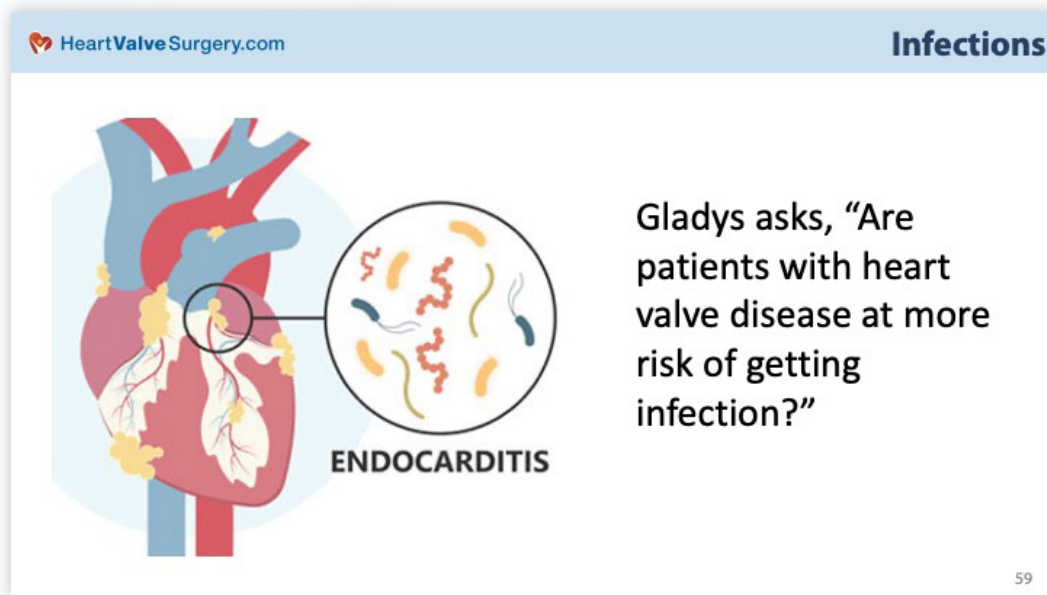
Do the patients with "Severe" MR, low LVEF, and dilated have less chance to gain back or exceed their pre-surgery LVEF%?



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Adam Pick: Mehrab has a fascinating question, set of questions about remodeling. I'm going to summarize it. If essentially you have mitral valve disease and you have some issues with left ventricular ejection fractions, can the heart remodel over time after surgery to restore kind of normal cardiac function?

Dr. Kevin Hodges: Yeah, it's actually a complicated question. It depends a little bit on what the ideology of everything is. I'm going to make an assumption here for the purpose of giving a concise answer, and I'm going to assume this is mitral valve prolapse and the ventricle has dilated as a result of the valve disease. Once the ejection fraction starts to decrease, you often never get back to a totally normal ejection fraction. I think it's worth pointing out that ejection fraction number doesn't exactly equal heart function. It's an estimate. It's based off a 2D echo picture, so if your ejection fraction is 45 to 50%, I fix your mitral valve and it drops to 30 to 35%, you're still going to feel way better at that level because at that 45%, half of that blood is going backwards. Effectively, your effective ejection fraction is much lower.



Adam Pick: Gladys has a great question. "I'm in the waiting room. Are patients with heart valve disease at more risk of getting an infection?"

Dr. Kevin Hodges: Yeah, certain things like mitral valve prolapse, bicuspid aortic disease have been shown to be associate with increased risk for endocarditis, but that risk is probably relatively low. If you take as evidence the American Heart Association guidelines for taking antibiotics during a dental procedure, they've actually stopped recommending that for people with all sorts of things. It's really for people with artificial valves or previously repaired valves, things like that. There is an increased risk, but it's not something that you have to live your life in fear, and you don't necessarily have to take extra precautions.

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TAVR

Kim asks, "I now have Moderate Stenosis of Aortic Valve. Is TAVR suitable for someone with BAV who is below 60 years old. Like most people, I am a bit apprehensive about getting the open heart surgery. My Goal is to try and advance to my late 50's before the surgery needs to be performed."



Medtronic Evolut TAVR

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Adam Pick: Great. I'm going to jump forward to this question from Kim because I get it all the time. Kim asks, "I now have moderate aortic stenosis. Is TAVR suitable for someone with a bicuspid aortic valve who's below 60 years old? Like most people, I'm a bit apprehensive about getting the open heart surgery. My goal is to try and advance to my late 50s before surgery needs to be performed."

Dr. Kevin Hodges: Yeah, TAVR's a fantastic technology, we said at the beginning. It's probably very good for low surgical risk people. I think it's good for really a lot of people, especially for people with normal aortic valve anatomy. The categories of people where maybe surgery is still the right way to go, unfortunately, is probably Kim where bicuspid aortic valve, the seal with the currently available technology is not quite as good. People with bicuspid aortic valve who are younger potentially are going to need multiple operations in the future. There's also some concern about if you can get quite as big of a valve size. These patients probably are still better suited with a surgical valve replacement but the good thing, Kim, as a healthy 50-something year old who has a bicuspid aortic valve is almost certainly going to be a good candidate for a minimally invasive operation. That's somebody that, although they're not excited about heart surgery, it may be coming down the road and probably somebody we can do a very good operation for.

Adam Pick: Well, thank you. On that note, wow, we still have over 200 people on the line. We are now over time and before you go ahead and exit the webinar, please hold on. On behalf of myself and the team at HeartValveSurgery.com, Dr. Hodges, we want to extend a humongous thank-you to you. We have learned a lot today, and we can't thank you enough for taking time away from your very busy practice at Northwestern to help us learn about the five warning signs. Thank you, Dr. Hodges.

Dr. Kevin Hodges: Absolutely. Adam, thank you so much.

Patient Resources

Since 2006, HeartValveSurgery.com has developed several resources to help you better understand your diagnosis, your treatment options and your recovery.

Listed below, please find resources created exclusively for patients and caregivers. We hope they educate and empower you.

- [Adam's Free Patient eBooks](#) - Download 10+ free eBooks about heart valve disease and treatment options for aortic, mitral, pulmonary and tricuspid valves.
- [Heart Valve Learning Center](#) - Visit the Heart Valve Learning Center to access over 1,000 pages of educational information about valvular disorders.
- [Patient Community](#) - Meet people just like you in our patient community. There's nothing better than connecting and learning from patients who are sharing their stories in our community.
- [Surgeon Finder](#) - Find and research patient-recommended heart surgeons that specialize in heart valve repair and heart valve replacement procedures.
- [Heart Hospitals](#) - Learn about medical centers that have dedicated teams and resources that specialize in heart valve therapy.
- [Adam's Heart Valve Blog](#) - Get the latest medical news and patient updates from our award-winning blog.
- [Educational Videos](#) - Watch over 100 educational videos filmed by the Heart-ValveSurgery.com film crew about heart valve surgery.