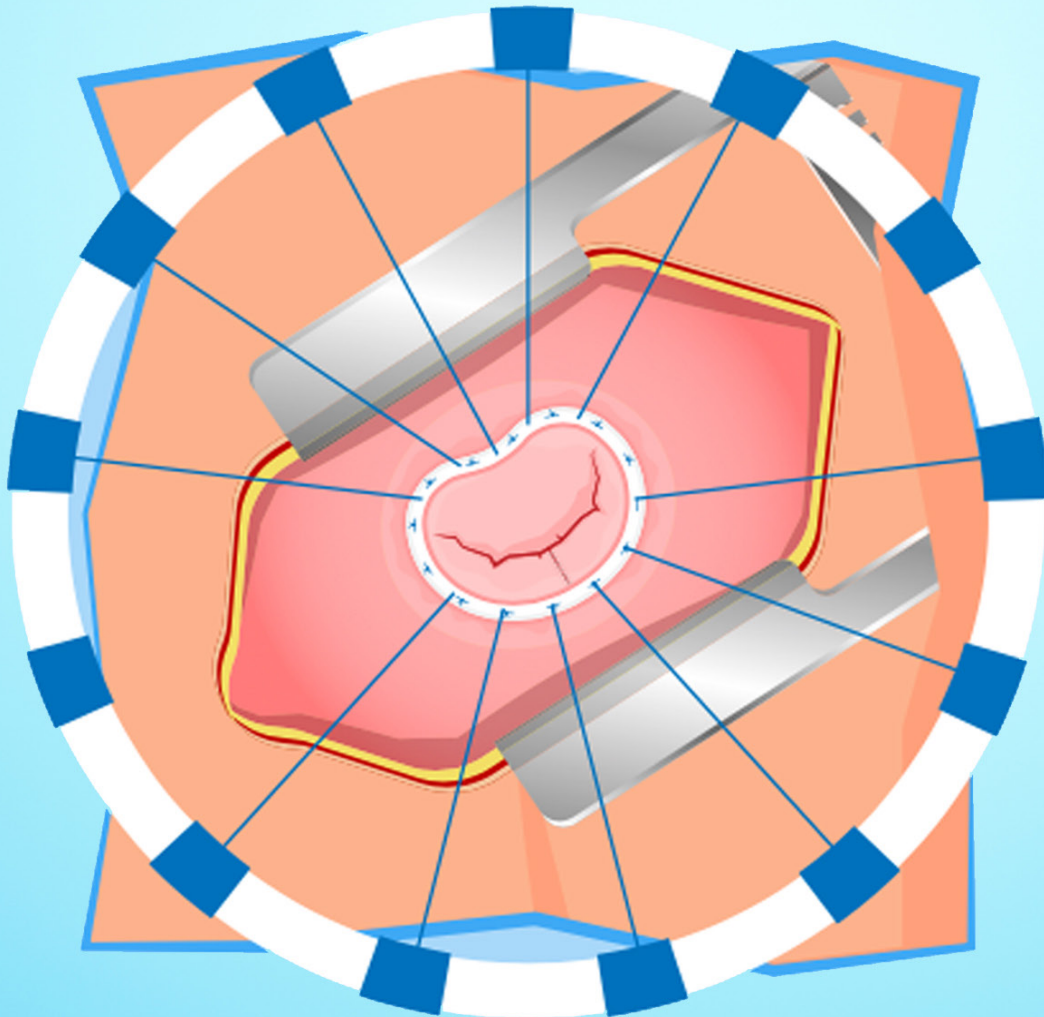


ADVANCES IN MITRAL VALVE SURGERY



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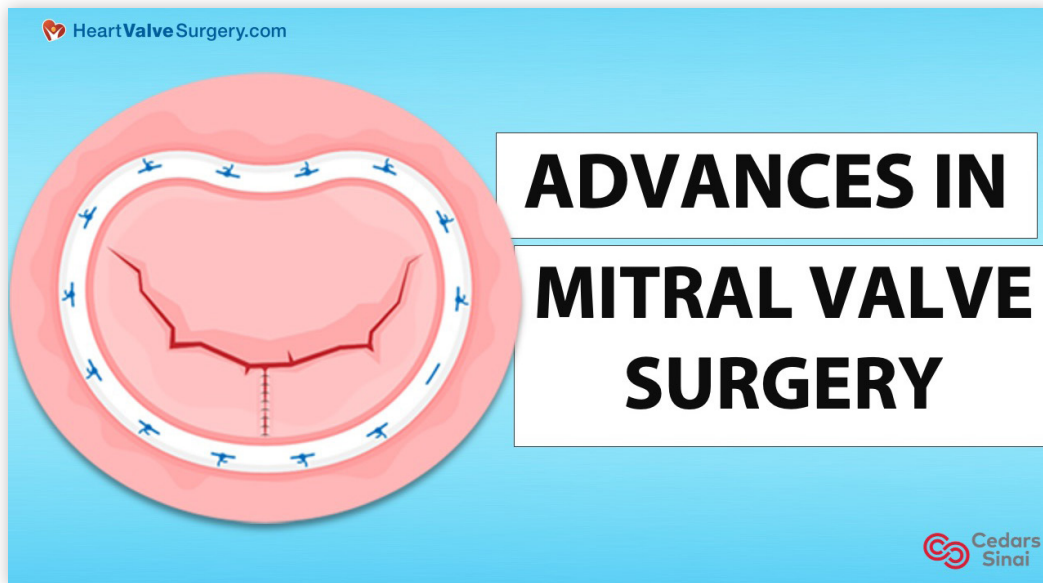
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Table of Contents

Introduction	5
Featured Speakers	7
Dr. Joanna Chikwe	7
Wendy Spector	8
Cedars-Sinai & HeartValveSurgery.com Patient Success Stories	9
Mitral Valve Disease Symptoms & Causes	10
Mitral Valve Disease	11
Life Expectancy After Mitral Valve Surgery	18
Mitral Valve Repair Outcomes	21
Multiple Valve Surgery	25
Minimally Invasive Mitral Valve Surgery	26
Evaluating A Mitral Valve Repair Surgeon	28
Robotic Mitral Valve Repair Specialists	34
Speaking With Your Surgeon	35
Mitral Valve Disease Progression	38
Mitral Valve Reoperations: Surgical versus Transcatheter	39
Understanding Your Echocardiogram	43

The Future of Mitral Valve Surgery	48
Clinical Trials for Mitral Valve Disease	49
Patient Resources	51

Introduction



Adam Pick: Hi, everybody. My name is Adam Pick, and I'd like to welcome you to the webinar titled "Advances in Mitral Valve Surgery". If I have yet to meet you, I'm the patient who started HeartValveSurgery.com all the way back in 2006. Our mission here is real simple. We want to educate and empower patients just like you, and this webinar, which has had over 350 registrations from patients in countries all over the world, was designed to support that mission.

During the webinar, you're going to be in what's known as "listen only" mode, but I'd encourage you to ask your questions using the control panel in the bottom part of your screen, and I'll explain to you why that is.

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Agenda

- Introductions
- Mitral Valve Disease
- Mitral Valve Treatment
- Questions & Answers
- Patient Survey


2

When we look at the agenda for today – I’m going to introduce the wonderful, featured speakers, and then we’re going to talk about mitral valve disease, mitral valve treatment, we’re going to have Q&A along the way, and then we’re going to have a very quick five-question survey.

Featured Speakers

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Dr. Joanna Chikwe



Dr. Joanna Chikwe


- Cardiac Surgeon
- Founding Chair of the Department of Cardiac Surgery in the Smidt Heart Institute at Cedars-Sinai
- Specialties
 - Heart Valve Therapy
 - Minimally-Invasive
 - Robotic-Assisted
- Published numerous articles about cardiac surgery

3

Adam Pick: It is my honor to go ahead and introduce you to [Dr. Joanna Chikwe](#), who is not just the chair, she's the founding chair of the department of cardiac surgery in the Smidt Heart Institute at Cedars-Sinai. Her specialties are heart valve therapy, minimally invasive techniques, and robot assisted mitral valve therapy. She's published not one, not two, but ten, but a lot of articles and research on this very important topic.

I've been fortunate to know Dr. Chikwe – we met in an operating room in New York City - well over 10 years ago. We were watching an aortic root replacement. She was participating in it. She's just a great person. I'm so thrilled to have her on the line. Thanks for being with us, Dr. Chikwe.


Dr. Joanna Chikwe: Thanks so much, Adam.

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Wendy Spector

Wendy Spector

- Mitral Valve Patient
- Treated in June, 2021
- Surgery Performed at Cedars-Sinai
- Wife and Mother of Two



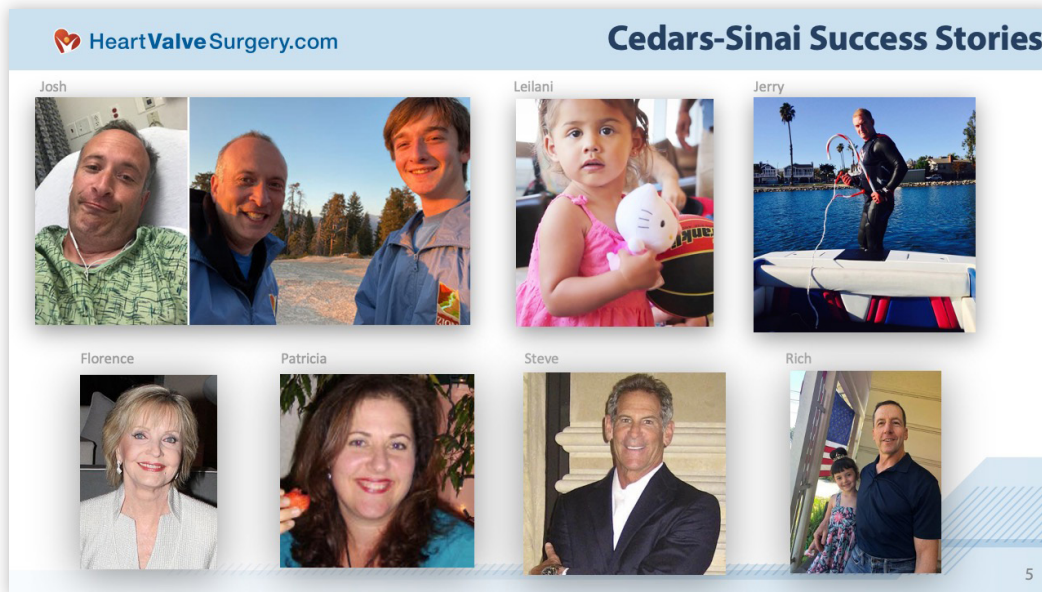
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Adam Pick: Now let's introduce another great person who is Wendy Spector. What do we need to know about Wendy?

She is a mitral valve patient. She was treated by Dr. Chikwe back in June of 2021, so it was being done during COVID. She had the surgery performed at Cedars-Sinai. She's a loving wife and mother of two. Wendy, I can't thank you enough for bringing the patient perspective to this webinar today. Thank you for being with us.

Wendy Spector: Thank you.

Cedars-Sinai Patient Success Stories

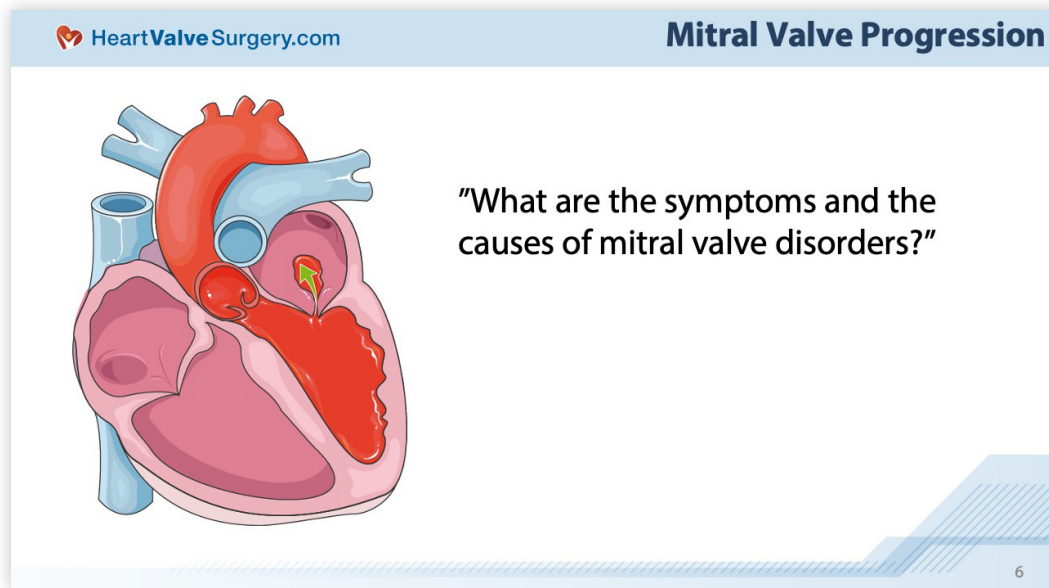


Adam Pick: I could go on-and-on about the achievements of Dr. Chikwe and the entire team there at Cedars-Sinai - whether it's Dr. Trento, Dr. Ramzy, Dr. Esmalian, Dr. Makkar. What I like showing is the smiling faces of the patients in the HeartValveSurgery.com community that have had incredible results at Cedars.

Whether it's Josh or little Leilani or Jerry Andiss or Florence or Patricia, Steve, or Rich... This is what commitment to heart valve therapy looks like. It's the smiling faces of patients who have incredible outcomes.

To learn all about the approach that Dr. Chikwe and her team takes, I'm going to go ahead and turn over the webinar to Dr. Joanna Chikwe.


Mitral Valve Disease Symptoms & Causes



Dr. Chikwe: Adam, thanks so much. I thought it would be great if we could just really answer some of the questions that your community have sent in. Wendy, I think it's just wonderful that you agreed to do this. Thank you for doing it at such short notice. Maybe we could start with this question about symptoms. I often tell people to ask what might I feel from this disease. You might feel nothing at all. You might feel completely fine. From your perspective, what did you feel around the time that you were diagnosed with [mitral valve regurgitation](#)?

Wendy Spector: For me, I had a quirky other issue going on with my sternum, so I don't believe I was feeling anything. However, while trying to diagnose what was going on in my sternum, they found the mitral valve regurgitation. So, at the time I was diagnosed, which was probably four years ago, it was considered moderate. At the beginning of January 2020, I started to have mild symptoms – just little flutters and a little bit of – flutters and erratic. So, that sent me to get an echocardiogram six months later, and they looked at it that it was severe at that point.

Mitral Valve Disease

 HeartValveSurgery.com

Mitral Valve Symptoms

- No symptoms: “I feel fine!”
- Feeling winded or breathless
- Chest discomfort
- Palpitations
- Fatigue

7

Dr. Chikwe: You represent about a third of people I see in the office with severe mitral regurgitation. They either feel fine or just have slight palpitations.

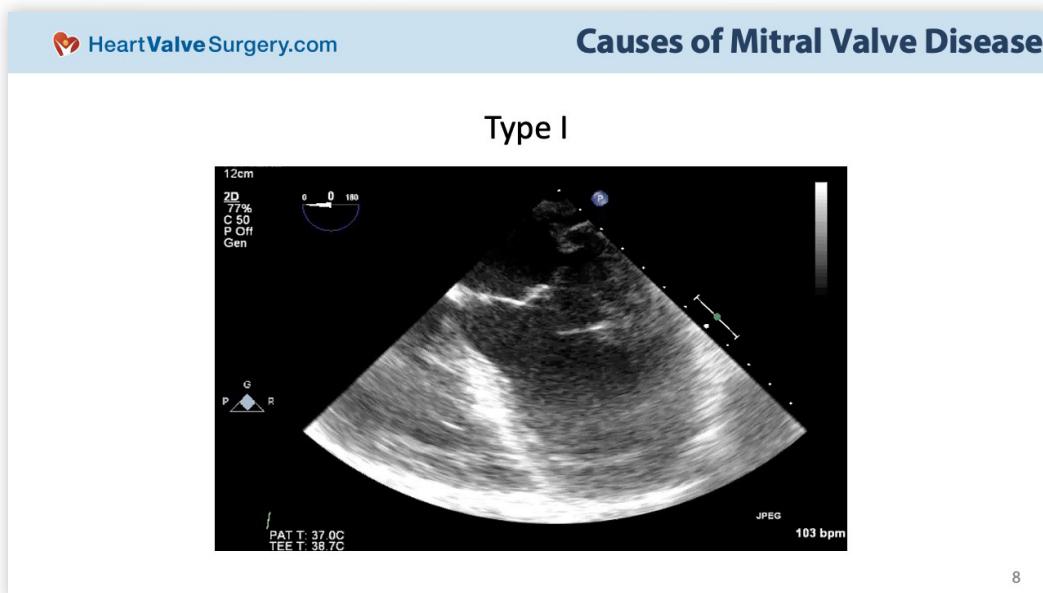
Wendy Spector: Correct.

Dr. Chikwe: The other two thirds are feeling more limitations, so that might be feeling winded when you're just walking, talking or walking up a slight hill. Some people feel chest pressure or discomfort, not usually pain. Then fatigue is a really common complaint. It's amazing the number of people that say I just feel completely de-energized. I would never say that surgery will fix that because there's so many causes of fatigue. But, I always do say I'm surprised at how many people say their fatigue gets better once you fix their mitral regurgitation.

There's one question from Joel Kaplan in the chat about syncope with shortness of breath symptoms.

Syncope means near fainting. It's literally you're blacking out. Syncope can be caused by many things that go on in your heart. One of them is mitral regurgitation, although it's not a common sign of mitral regurgitation. People sometimes feel – they say they feel breathless or dizzy when they bend over.

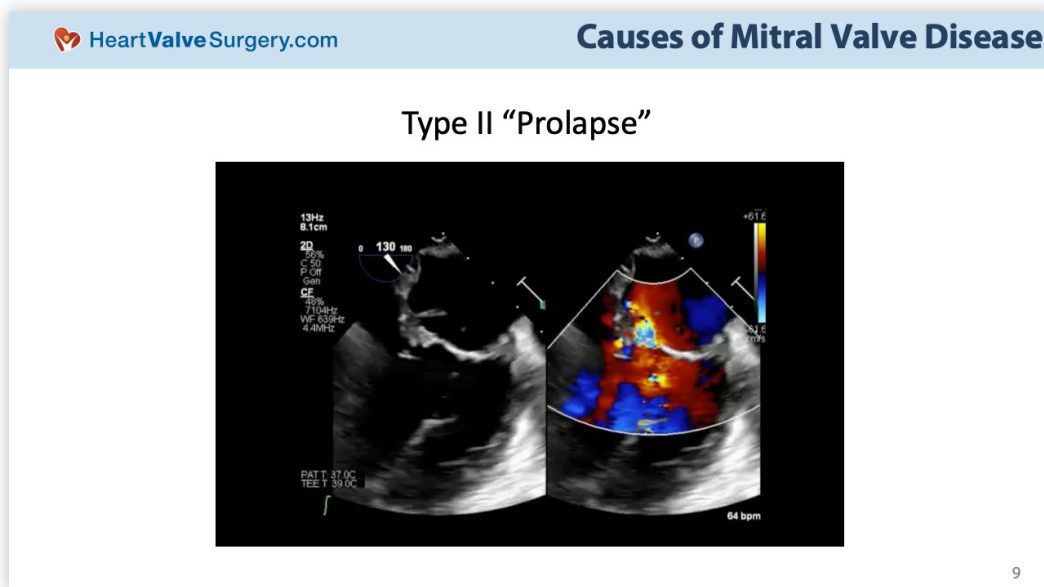
But, if you've got an arrhythmia, that's an irregular heartbeat, that could make you feel like you were about to black out. And, very tight valves can cause syncope.



Dr. Chikwe: The next slide is I think really about what are the causes of mitral valve disease. Here this is a real mitral valve. It's a very normal looking one. The thing that's causing this valve to leak is actually because the framework, the skeleton of the heart is stretched.

So the valve itself is completely normal but the leaflets don't meet. So, the way we fix it is to make that skeleton whole and tight again with this ring. This valve is holding saline under pressure, which tells us in the operating room that it doesn't leak. You can see there's a jet of fluid that comes out. It holds it under pressure. Now this white material beneath that purple line tells us that the amount of valve that is coming together there in the echo shows that that's a beautiful valve. There's no more leak.

That type of valve problem is now treated in many centers by a [MitraClip](#). It's very different to what Wendy had.



Dr. Chikwe: If you're a little bit squeamish, I'm going to tell you to look away from the screen from the next two videos.

This is prolapse. This is what many people searching for a repair had, and it's just caused by floppiness. You see this little bit that's coming up here. In the other video, all of these cords were intact. That's a broken cord. That cord no longer attaches that bit of the leaflet to the skeleton and the inside of the heart. That's why that leaflet flips up, and that's the cause of a leak, and this a beautiful thing to repair. We're repairing it here robotically. This is not Wendy's video, but it's very, very similar. I'm curious, Wendy, what do you think as you're seeing it?

Wendy Spector: I'm so glad I'm on the other side of it.

Dr. Chikwe: I can only imagine.

Wendy Spector: I did a lot of research, but I did not do that.

Dr. Chikwe: We just cut out a little triangle of that floppy bit, and we're now just going to sew the edges back together. The edges are the bit that's normal. We've cut out the bit that had a broken cord, and it's like repairing a parachute. If you imagine a parachute is kept in place with lots of cord and the cords break, you might have a little bit of the parachute flipping up as you're falling down through the sky, and really what we've done is cut out the floppy bit and bring the edges of the bits that are well supported back together. That's how you do a mitral valve repair.

The last thing you'll see in this video is a little band that we place around the valve. That's really important because we really understand that that is what is necessary to avoid this valve leaking in the future. So, you can just about see that band going into place. Now, we test the valve by injecting some saline just to see if it's watertight, and you'll see that it is. It holds the fluid really, really well. The next thing that you see is the echo after surgery. That shows again no leak, and that's really important for us. We want everybody to come out of the operating room without a leak.

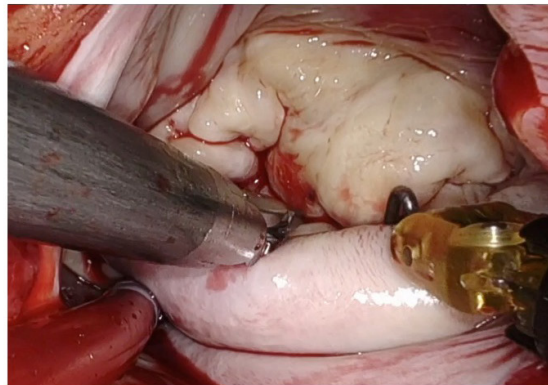
Then again if you're squeamish, don't look at the next video, but what I'm going to show you is a Barlow's valve. This is a really complicated mitral valve to repair. If you remember what you've just seen, you saw the nice, floppy normal valve to start with. You've just seen a really common P2 prolapse we call it. This valve is Barlow's. This is much more complicated, and I think you'll see instantly why.

Adam Pick: Dr. Chikwe, I'm trying to put my thinking cap on for some of the patients that are on the line. They are hearing these terms like cords and prolapse. I wanted to focus real quickly on the cords. The mitral valve as I understand it is pretty unique in that it has cords where other valves may not have valves. Is that true? Can you talk about what is the purpose of those cords?

Dr. Chikwe: Absolutely. It's a little bit like a parachute. The cords are what help the valve work properly, and the other valve in your heart that has cords is the tricuspid valve. That's on the right side of your heart.

There's a very interesting study that's going to be "hot off the press" at the American Heart Association this week is looking at whether the tricuspid valve should be repaired at the time of mitral valve surgery because it often doesn't work very well. Putting in new cords is one way that many surgeons treat the mitral prolapse that we've just seen. That works very well for many patients.

Type II - Barlows




10

Dr. Chikwe: Here's a Barlow's valve which is the most complicated thing that we get to repair. I think you can see here how completely abnormal this valve looks compared to what you've just seen.

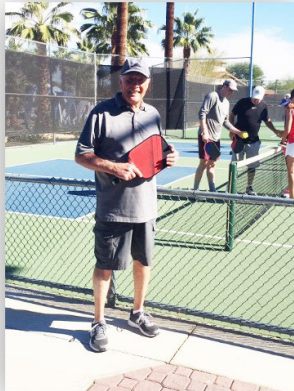
If you've got a diagnosis of Barlow's valve disease, your surgeon's going to have to do a pretty complex repair. You really want to take that to an expert. It's hard to get these valves to work beautifully because as you can see, every single bit of this valve is not normal. It's completely different to those valves that you saw before. The cords are all long. They're not the right length. That's why this valve leaks.

Life Expectancy After Mitral Valve Surgery

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Normal Post-Op Life?

Jon asks, “I was somewhat shocked to learn that I have moderate-to-severe mitral regurg. I’m an athlete and want to continue running, pickleball, and golf. Can surgery eliminate symptoms and get me back to normal?”



Frank

11

Dr. Chikwe: Here’s a question from Jon who says “I was somewhat shocked to learn that I have moderate-to-severe mitral regurg. I’m an athlete and I want to continue running, pickleball, and golf. Can surgery eliminate symptoms and get me back to normal?”

Wendy... I’m curious, could you describe how you feel now – and remember Wendy felt pretty normal at baseline – and what was the trajectory of recovery that you had? How long did it take for you to feel good?

Wendy Spector: For me, the recovery very undramatic, which is a very positive thing. I think the anticipation prior is so much worse than the recovery. My recovery in the hospital was three or four days. Obviously, there was pain, but it was very tolerable. Actually, I never felt like I had major surgery. It was

something that was very surreal to me. It was uncomfortable, yes, but it is very tolerable. I had minimally invasive procedure, which is a little bit easier, a little faster recovery.

I went into it as everybody agreed at a very good time instead of letting anything further progress. So, I want to say the anticipation, which I have heard from so many people, is so much worse than actually going through the surgery.

Yes, you can get back to a very normal life. I'm doing cardiac rehab now for a couple of months. They monitor you for the first couple sessions. Then you can become more confident that you are strong enough to do what you want to do. For me, it's pushing me to actually stay on a regimen to exercise but I feel fine now. I'm good.

Dr. Chikwe: That's just so great to hear. I think surgeons often have an overly optimistic view of how fast the recovery is, and we say things like, "You'll be back to normal in a few weeks." But genuinely, I think it takes people much longer to get truly normal.

Wendy Spector: I agree with that. You feel like you've been through something. To help me, I was walking a lot a couple of days after surgery. I was doing several miles. So again, it was not dramatic.

Dr. Chikwe: To speak to Jon's question – and this is where I turn into a bit of a mitral repair evangelist – the whole point of a mitral valve repair is to get you back to normal.

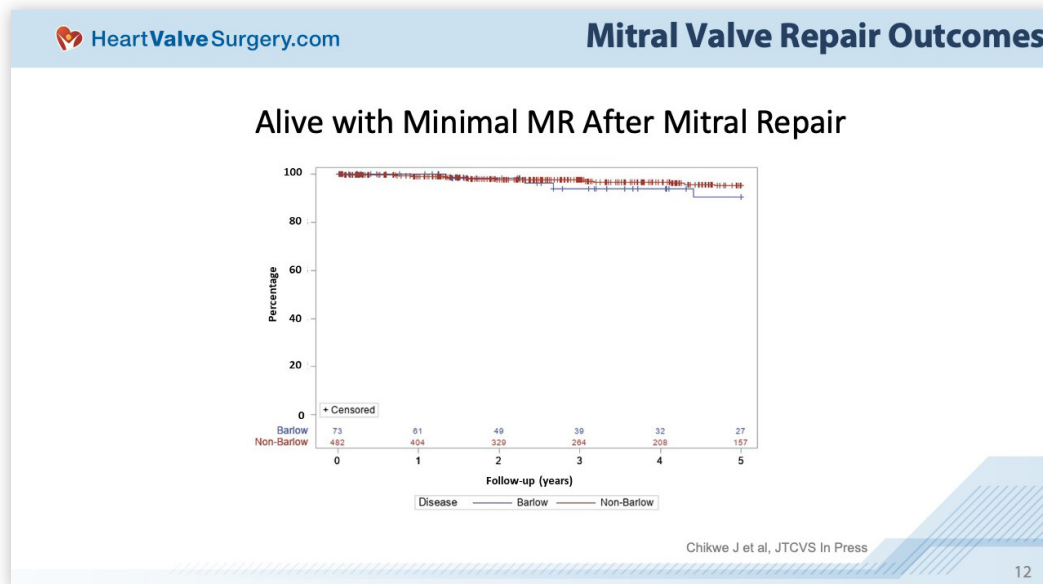
The most important part of normal is a normal length of life. We want you to have a normal life expectancy as if you didn't have anything wrong with your heart, and mitral valve repair is an amazing operation because it's one of the few things we do that if you do it right gets you back to a normal life expectancy, and it should get you back to a normal quality of life.

We've all operated on patients who are older and more limited, and a few of us get to operate on athletes, and it's really rewarding to get somebody back to running their marathon.

It's just completely the goal of surgery. So, I think you should be able to get back to pickleball and golf no problem. The only thing is that you'll be putting for a few weeks and save the big swings until – if you had a sternotomy - until that's really well healed.

I can't say I'll improve your handicap, but you should be able to be back on the golf course no problem.

Mitral Valve Repair Outcomes



Dr. Chikwe: This is a graph that looks at about 500 patients that had robotic mitral valve surgery at Cedars over five years after surgery. What you're seeing is their survival without recurrence of their mitral regurgitation. This answers a couple of questions that are in the chat there. We've looked at patients, and we looked at people that had Barlow's disease and people that just had more straightforward repairs, and oftentimes, surgeons struggle to repair Barlow's disease, so you see slightly worse survival. You see a lower line there in the blue, but in our hands, you can see at about five years, more than 95% of people there are basically alive doing well with minimal, mitral valve regurgitation.

That's the kind of outcome that you want to look for when you're looking at the surgeons in the centers to have your surgery. This really great 90%, 95% freedom, alive from mitral valve regurgitation at five, ten years and longer. We're really shooting for the long-term here.

Adam Pick: We've heard so far about mitral valve repair. But what about mitral valve replacements? As patients we often think of the new, out of the box shiny objects to replace the old defective valve. , I want a new mitral valve replacement. Can you maybe spend just a little bit of time talking about why a repair is so beneficial for patients? I know you've referenced a couple things, but it might also help for patients to compare that to the realities of a mitral valve replacement.

Dr. Chikwe: The reason a mitral valve repair is so much better for you than a replacement is because it's the only operation that gets you back to a normal life expectancy. Mitral valve replacement is better than doing nothing if you have a severe leak. But, it doesn't get you back to normal life expectancy. You're taking a few years off your life.

If you have an animal valve, which is one of the options, a tissue valve, you're probably buying yourself another operation down the line. If you have a mechanical or a metal valve, less likelihood that you'll need another operation. But, you will have to take a blood thinner. Both of those – and this is important – both of those kinds of artificial valves have a slightly higher risk of stroke every single year that you have them than a mitral valve that's naturally yours, i.e. a repaired valve. All in all, there are very strong reasons and important reasons to try and get a mitral repair, and if you can't have one and there was no other option, a replacement is not the end of the world. But, it just isn't as good long term for you as a mitral valve repair.

Adam Pick: Thank you so much. A follow-on might be for patients on the line who have mitral stenosis. Can you talk very quickly about – and I don't know if it's in the slides coming up – about treatments potentially for those patients?

Dr. Chikwe: We can talk about those options coming up. Before we get to that, I'm just curious, Wendy, you traveled quite a long distance for your surgery. Was getting a mitral valve repair a key consideration in your decision making?

Wendy Spector: It absolutely was. Initially, I was given the diagnosis. I went home that night and immediately started researching. I had narrowed it down to three or four of the top institutes that primarily work with mitral valve repairs and/or surgeries.

I was actually scheduled with an East Coast surgeon. I'm on the East Coast. Dr. Chikwe's on the West Coast. However, I kept coming across Dr. Chikwe's readings and writings, and I kept going back to certain things that she had said. I initially had thought a sternotomy was the only way of surgery and because I had problems with my sternum, I didn't want to aggravate anything there if I didn't have to. So for me, I knew I wanted a repair if possible.

I knew that I wanted a top surgeon that could do that repair and was comfortable with repairs. I was referred to somebody locally, and good surgeon, but that was not his specialty. So I knew I did not want to do that. I wanted to do minimally invasive just not to aggravate again the situation. So, I was scheduled with an east coast facility. I decided to take a shot and call Dr. Chikwe's office because I knew she was familiar with a lot of the facilities. She was so well written on the subject.

In my wildest dreams, I never thought I would go to California for surgery.

But, I figured okay, take a shot and see if she could at least give me a recommendation.


I left a message for Dr. Chikwe. If you wouldn't mind just yay or nay with this facility, and her assistant said, "Why don't you talk to Dr. Chikwe yourself?"

Of course, we were scheduled for a half-hour Zoom, which turned into over an hour. By the end of it, I said I'm coming to California. That was it.

Dr. Chikwe was so thorough as she is now in laying out the "pros and cons" of the different types of surgery, the point about doing it now rather than later, still being very moderate in her thinking.

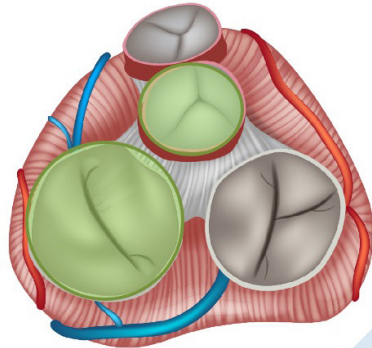
Dr. Chikwe wasn't aggressive, soliciting that I had to have this done imminently.

Multiple Valve Surgery

 HeartValveSurgery.com

Multiple Valve Surgery

Linda asks, "I am told that I may need aortic and mitral valve surgery in the future. Can that be done minimally-invasive?"



13

Dr. Chikwe: The chat panel is exploding on this webinar. So, we'll come to some of those questions soon.

I want to address the question that Adam asked. For those of you like Linda that need aortic and mitral surgery or maybe tricuspid valve surgery, the answer is yes. These procedures can all be done minimally invasively. Although I always use the words "minimally invasive" with a slight eyebrow raise. It's all open-heart surgery, okay? We are stopping your heart and opening it and repairing and fixing these valves. The next slide shows you a minimally invasive incision.

Minimally Invasive Mitral Valve Surgery



Dr. Chikwe: The incisions can be very small. This picture is a patient about three months after this surgery. The incision is actually – it's about the length of the short end of a credit card. It's under his nipple, and you can barely see it. Then he's got a couple of port sites, so those little dimples.

That for us is minimally invasive surgery but it was still open-heart surgery. The only minimally invasive thing is the incision with a slightly better recovery. You can do an aortic valve surgery through a similar size incision more towards the front of the chest. You can certainly do tricuspid valve surgery that way.

For those of you that have maybe had previous aortic and mitral valve replacements, we are definitely increasingly doing more of those through the groin using transcatheter techniques.

That would be [TAVR](#) in the case of aortic valves and TMVR in the case of mitral valves.

That is definitely an option for a large number of patients. I always tell people that for most people redo surgery is not a huge incremental risk. We often do it through the same small incision, but it is really great that there are now transcatheter options, which don't involve open-heart surgery.

The only caveat is we haven't been doing TAVR and TMVR for long enough collectively as a specialty to have the same 10-year, 15-year follow-up data.

We know they're really good for maybe two, three, four years, but the jury is still out on whether these are as great long-term. But certainly, you have a much bigger range of options now to treat any kind of valve disease than we did even three or four years ago.

Evaluating A Mitral Valve Repair Surgeon

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Evaluating A Mitral Valve Repair Surgeon

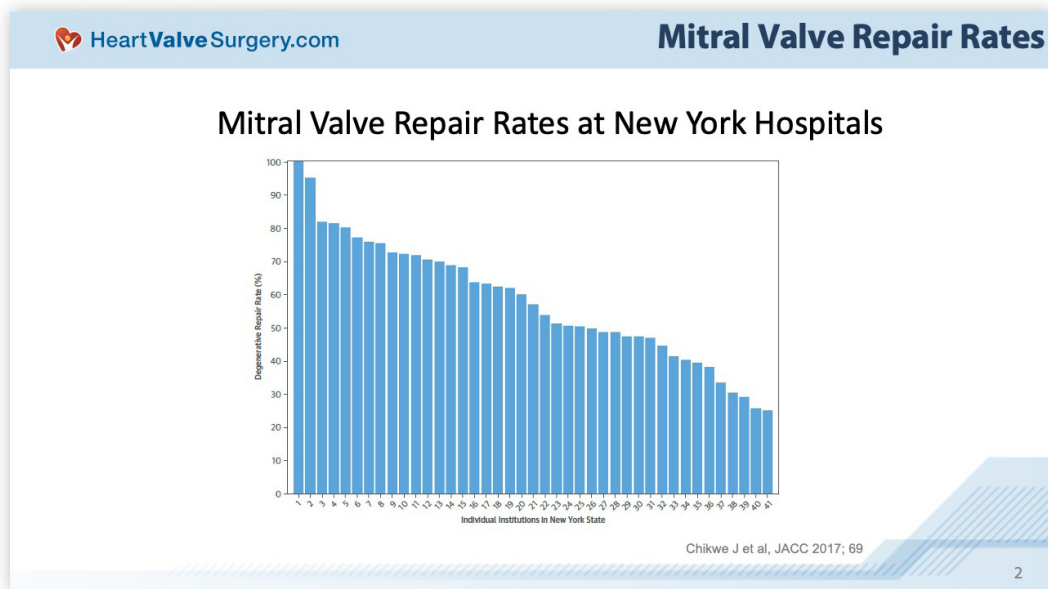
Tina asks, "Given my mitral disease and what I've seen at your website, I'd like to get a repair. What questions should I ask the surgeon to figure out if he is a specialist?"



15

Dr. Chikwe: This was a question from Tina who asks "Given my mitral valve disease and what I've seen at your website, I'd like to get a repair. What questions should I ask the surgeon to figure out if he is a specialist?" I'm going to ask Wendy. How did you get a sense of which of the surgeons had enough specialist interest for you to be confident in them?

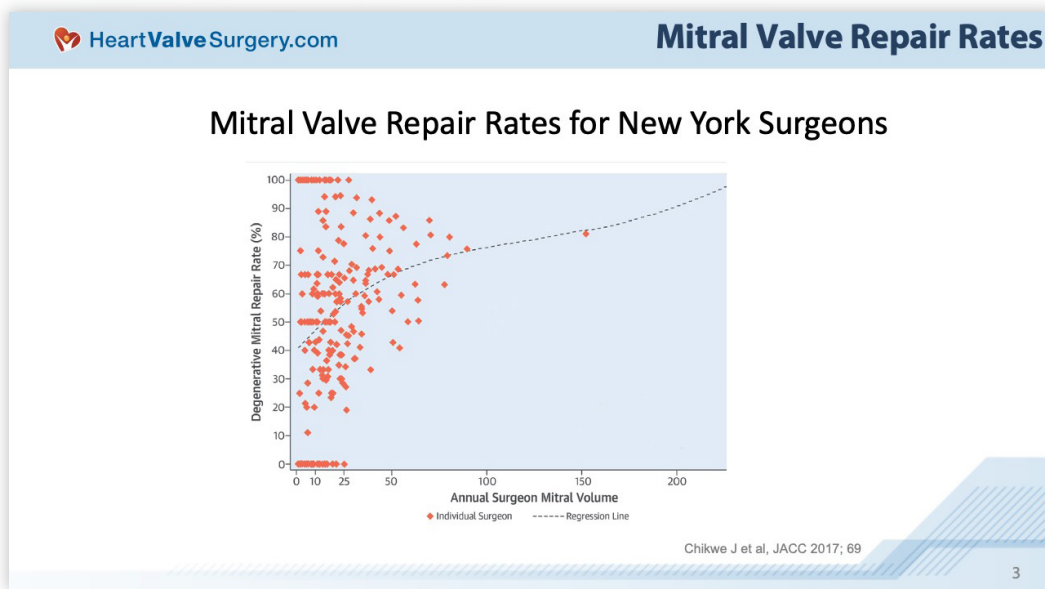
Wendy Spector: I just kept researching each hospital and each surgeon who specialized in mitral valve repair. I sent my scans to different facilities. The only thing I could say you need to be thorough, and you need to go with the surgeon and hospital that you're comfortable with.



Dr. Chikwe: That is really, really helpful. The other thing that people may find very helpful is Adam's website, which has this great list of questions that you should ask your mitral valve repair surgeon.

If you go to the next slide, this is some of the research that helped us formulate these questions. This graph shows you all of the hospitals in New York state that do heart surgery. It shows you the percentage of patients with floppy mitral valves that were saying we should absolutely repair these valves because it's better life expectancy and better quality of life. So, you should have a 99% repair rate.

This chart shows you the percentage of those valves that were actually repaired at each of these hospitals.



Dr. Chikwe: The thing that's really striking about this and really surprised me when I did this research was that there's so much variability. Depending on which hospital in New York state you go to – and this is the same across the country – your chances of getting a mitral valve repair could be almost 100%, or it could be as low as 30%. That's really shocking, and that is driven by this variability amongst individual surgeons. Each red dot on this slide represents an individual surgeon in New York state and on the horizontal axis, you've got the number of times they do mitral surgery on average a year, so 50, 100, 150, and on the vertical axis, you got the repair rates, so the percentage of mitral valves that they repair.

You've got surgeons at the top with 100% repair rates. That's the kind of surgeon that you want, 100% repair rate or 95% repair rate. The surgeons below 50% are not the mitral valve experts. They're replacing an awful lot of valves that should be repaired. That's one of the key things you want to ask your surgeon is how

many valves like mine have you repaired? What is your percentage repair rate? What are your outcomes? What are my chances of getting through the surgery doing well and having a good repair that lasts with you? That's more important than the size or location of your institution. It's astonishing that there's this much variability, and it's quite difficult to find out numbers like this.

Adam Pick: On average, do you know about how many mitral valve repairs a surgeon may do on an annual basis?

Dr. Chikwe: That's a really great question. When we've looked at the national data for the whole of the US, the average number of US that a cardiac surgeon, a heart surgeon in the United States sees the mitral valve every year – well, actually just write it down. Write down how many times you think a heart surgeon might see the mitral valve a year. I will tell you that on this research that you can see in front of you, we felt that there was about an inflection point of about 25 mitral valve operations a year when the repair rates got consistently good and people got really safe. If you did more than 25, you were good. Right now, I think if you want to be an American Heart Association approved mitral surgeon, the number's closer to 50.

Bearing those two numbers in mind, 25 to get consistently good, 50 to maybe get recognized by the American Heart Association, how many times do you think that the average cardiac surgeon in the US sees the mitral valve a year?

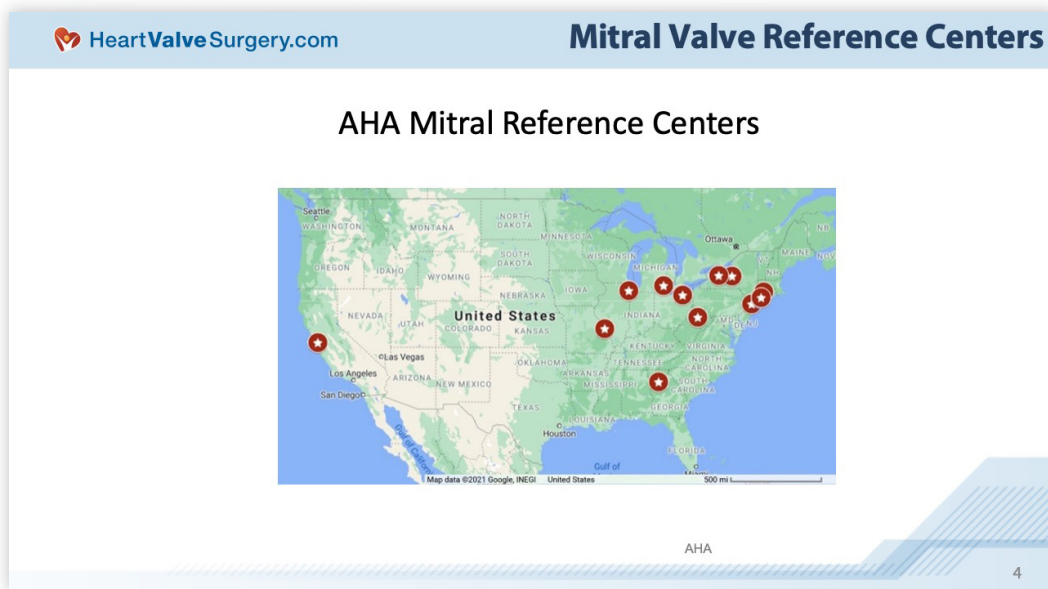
Less than ten times, single digits, and that's just astonishing because you saw the variety of those valves. How can you get good at something that's so variable and complicated if you're only doing it maybe less than once a month? That's why you really want to go to centers where they do a lot.

Look at this graph again, though. Here is a surgeon doing 150 mitral valve

repairs a year as a surgeon who only has a 70% repair rate, so it's not just about volume. It's honestly about the expertise and most of us in one of the slides that I'm going to show you have published our own programs data and our own individual data. We all aspire and are close to 99% repair rates. These are centers that've all done really over a thousand repairs. That's really what you're looking for.


Certainly if you've got a Barlow's valve, certainly if you're young and you really want a repair, those should be real drivers of the surgeon that you pick and it's not just about the convenience and the closeness. It's hard to travel for things like surgery, but this is probably one type of surgery that it's worth traveling for if you need to do it.

Wendy Spector: Absolutely.



Dr. Chikwe: This is the American Heart Association's effort to help make this process easier where you can identify centers that meet some of those volume thresholds. I think this is really, really helpful and really important. These are centers that do mitral valve repair more often than a minimum standard; I think it's about 50 a year. They do it well. They have 90% repair rates, so that's pretty good. Patients often come to Cedars and to me specifically because they want more than just that minimum standard.

Robotic Mitral Valve Repair Specialists

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Robotic Mitral Repair Centers

Most experienced Robotic Mitral Repair Centers

- Cedars-Sinai, Los Angeles
- Cleveland Clinic, Ohio
- Cornell, New York
- East Carolina, North Carolina
- Emory, Atlanta
- NYU, New York
- Penn Presbyterian, Philadelphia

5

Dr. Chikwe: They also want – frankly, they want a robotic repair, and if you show us the next slide, I'll usually tell them these are the centers that I would think about in the US that are experienced robotic mitral repair centers.

Great surgeons that will really maximize your chances of getting a great repair. You can see that you got a good amount of choice on the East Coast, a fair bit of choice in the middle. I should probably put my own clinic on there as well. It's a little bit more limited on the West Coast, but it's select. There are not many centers that do mitral repair well, and there's certainly not many centers – far fewer. It's a handful of us that do robotic mitral repair well.

Speaking With Your Surgeon

Dr. Chikwe: Here's a great question from John from the chat, "Don't all doctors feel that their opinion is always best, and won't they be offended if questioned?"

If somebody doesn't know the answer or can't give you a good answer, you definitely got to think very hard about staying with them for surgery. If the answer isn't right, if the answer is, "I don't know." or "I'll take a look at it in the operating room and then decide it could be a repair or replacement", those are really not the right thing to hear. You want to hear somebody that has done hundreds, has a 90% ideally more repair rate, great safety outcomes, and can look at your echo and say from your echo, I am confident that this will be a repair. That's just really important.

Adam Pick: Speaking with your potential surgeon can be very anxious and nerve-wracking, to say the least. I'm curious to know, Wendy, you seem like you were one of the top advocates out there for yourself. Did you write down all your questions before you talked to the physicians? Did you record your sessions so you could review after those discussions?

Wendy Spector: I wrote them down, sorry. I absolutely wrote them down, and I have to say, I had two or three cardiologists that were not in agreement that I needed surgery. I had one cardiologist I went for a second opinion when I was diagnosed and told me I needed surgery that would not even look at my echocardiogram. He listened to my heart, called himself the "heart whisperer", and proceeded to make noises like a heart and said, "Your heart's in fine shape."

You'll outlive your surgeons," and that was it.

I was absolutely an advocate. I was assertive in my quest. My conversation with Dr. Chikwe was 90 minutes. She answered all my questions and then some, and her follow-up end of conversation was, "Have I answered everything I can answer for you?" which is so reassuring. If I had to call her again, I felt like I could do that. I think that's good.

Dr. Chikwe: The beauty of Zoom and remote conferencing... You can have a very low stakes conversation remotely now with a lot of surgeons, and you can have more than one. You can go away to process it, digest it, run it by your cardiologist, run things by families and friends and then come back. I think that's really phenomenal. It means you don't have to get in a car or get on the plane and then be committed.

Secondly, it opens up the avenue for you to get a second opinion and if it's right for you, a third opinion. There are good people out there that will happily see you and have an intelligent conversation about you and your valve and what are the right options. It's just really important. It's a big thing to get right.

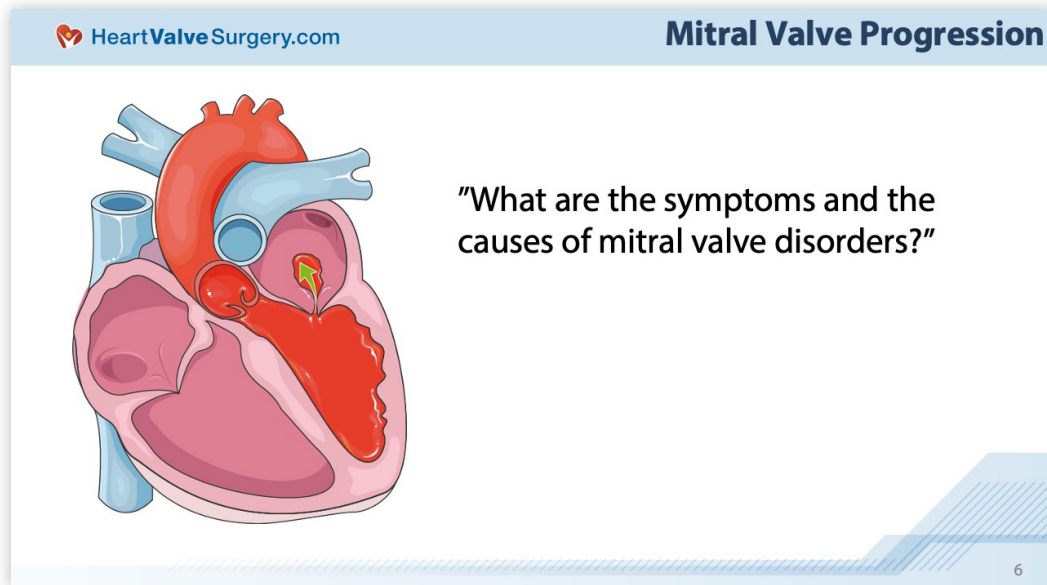
Wendy Spector: I met Dr. Chikwe the day before my surgery in person. I felt like I had known her and for me, what I had said is I know this is a life-changing diagnosis for a lot of people. However, from the surgeon and the staff's point of view, it's a routine that they do every day if you find that skilled surgeon. There is that point where you had to let your anxiety go... Once you've chosen what's correct for you and take that leap of faith and then know you're putting your

hands in a very skilled staff.

That became my mantra. It's not for them, they know what they're doing. For me, this is a one-time in a lifetime prognosis, and you just – you have to turn it over at that point once you're comfortable.

So, I never looked back. I never doubted it. I was actually quite calm with my anxious family the couple of days before. I just had to go into it knowing that I chose well.


Mitral Valve Disease Progression



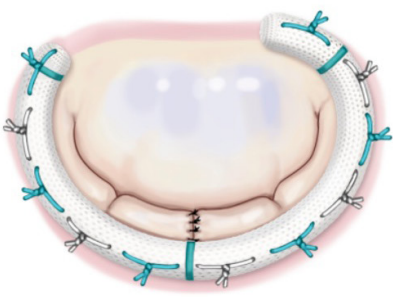
Dr. Chikwe: Jeff asks, "I was recently diagnosed with mild mitral regurgitation, told I could require surgery but not for decades. Is there anything I can do now to stop the leaking from getting worse?"

That's a tricky one, and generally it's the common-sense things like good blood pressure control is probably key. That can stress your heart. You don't want to get any other heart problems so the regular things like cholesterol, blood sugar, great exercise. There aren't really any medications that you can take to avoid mitral regurgitation progressing. The chances are if it's mild is that it will probably stay mild. I'm surprised somebody told you that you could require surgery in 10 or 20 years if you've only got mild regurgitation now. A huge part of the population is walking around with mild mitral regurgitation and they're never going to need surgery. Please don't worry too much about that one.

Mitral Valve Reoperations: Surgical versus Transcatheter

 HeartValveSurgery.com

Mitral Valve Re-Repair



Carla asks, "I have moderate mitral regurg. My question is what happens if a surgical repair fails? Are re-repairs performed surgically or using the catheters? What are the outcomes?"

22

Dr. Chikwe: One question from Carla, "I have moderate mitral regurg," so now we've gone from mild to moderate. Moderate is not needing surgery, but it sounds like Carla may have already had surgery and now she's got a leak. Her question is, "What happens if a surgical repair fails? Are re-repairs performed surgically or using catheters and what are the outcomes?"

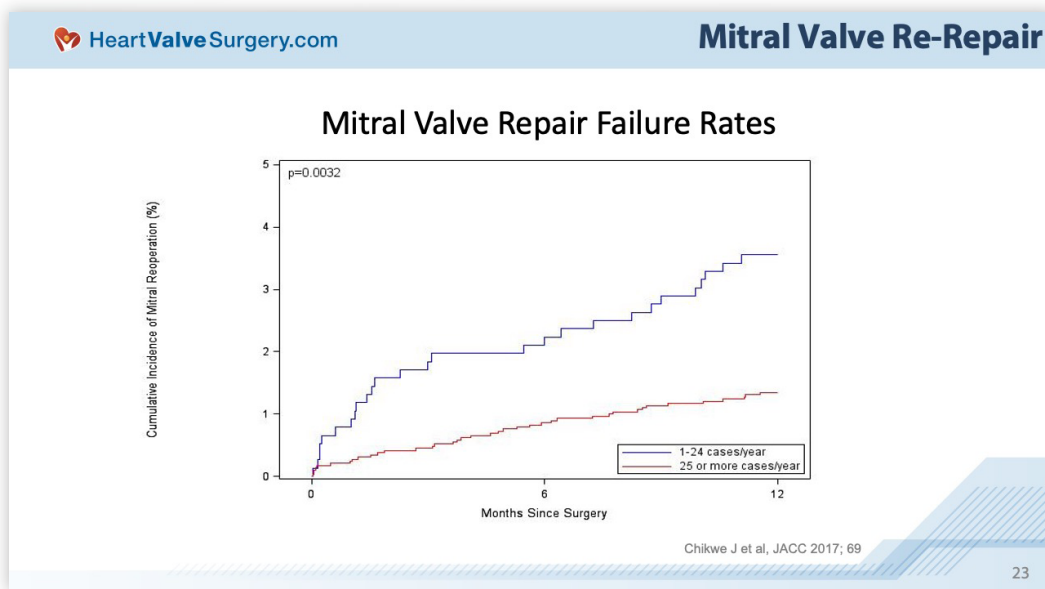
A lot of this depends on what was the cause of your mitral regurgitation in the very first place. If you had a floppy valve and you've had it repaired, it's often possible to re-repair that if that fails. It depends on why it failed. If a repair fails within the first few months after surgery, that's usually because of something technically problematic. It's not usually because disease progressed, and it's not usually because you got an infection. If there's a technical challenge, that can be straightforward to sort out. If it fails very late after surgery, five, six, seven, eight years after surgery, that's often times because the disease progressed, and that often is amenable to re-repair.

The key thing is it's a judgment call. We've talked about before you want a surgeon that can say with confidence based on your echo, I'm going to repair that. This is for first-time surgery. Second time surgery, it's much more of a judgment call in the operating room because you're really trying to balance the chances that this re-repair will last well versus it will just be safer to replace the valve. To maximize your chance of a surgeon making the right decision, you want to pick one of the three or four centers that has really good experience in re-repair and there're not many of us, but I would say Cedars. I would say Mt. Sinai in New York. I would say the Cleveland Clinic. Those three centers have probably got amongst the biggest experience in re-repairing failed repairs, and we get them from, frankly, all over the country.

Adam Pick: Dr. Chikwe, maybe we can shine some light on that because if I'm a patient, I'm hearing oh, I need a re-repair. Okay, they're just going to go back and redo what they did earlier. Are there certain risks or complications that occur for a re-entry into the heart or no?

Dr. Chikwe: Yeah, that's a terrific question, and what I would say there are the risks of just trying to get back in safely. After you've had first-time heart surgery, your body responds by making scar tissue everywhere it, frankly, was exposed to air. It's trickier to get back in second time, and that's why centers that have expertise in doing second time surgery can do it safely. They're very practiced in dealing with all eventualities and that's really important.

Then there's the challenge of addressing a valve that is now completely abnormal. That really does require a higher level of skill and experience to do that successfully. Transcatheter repair where you could have the valve reconstructed via a blood vessel in your leg is increasingly an option for people that may be too high-risk for surgery. It's generally rarely possible to re-repair a valve using a transcatheter approach. There are lots of reasons for that but essentially, it's challenging. Then there's a very small number of patients where you can replace the valve via that blood vessel in going after failure of a previous repair. The outcomes of that have not been great and again, there are a number of reasons why.



Dr. Chikwe: The bottom line is if you can find the surgeon that gives you a durable repair so it doesn't fail, that's front and central, number one.

If it does fail, pick a center that is an expert and that has done a lot of second time surgery because that will really maximize your chances of having a good, long-term result.

A few people have mentioned calcification after valve surgery. It's really common. All calcium is the body's response to an abnormal valve, so your own valve can calcify, and that's why people get stenosis, mitral stenosis or aortic stenosis. After you've repaired a valve, occasionally, because it just isn't normal anymore, it can calcify. That's quite challenging to deal with. We don't have great options and if you've got a calcified valve, most surgeons will be very, very cautious about offering you surgery. We want to do everything we can to maximize your quality and length of life without going in there and digging out the calcium again.

Understanding Your Echocardiogram

 HeartValveSurgery.com
 Echocardiograms

Marie asks, "I have mitral disease. When the doctor shows me an echocardiogram, I have no idea what I'm looking at. What should I know when I'm looking at an echo?"



Mitral Valve Regurgitation (Mitral Insufficiency)

Mild
The multicolor area represents the leak
The bigger the area, the bigger the leak

Moderate

Severe

24

Dr. Chikwe: I think the last few slides I want to focus on are really about echo. Here's a question from Marie, and it mirrors some of the questions in the chat. Marie asks, "When the doctor shows me an echocardiogram, I have no idea what I'm looking at. What should I know when I'm looking at an echo?"

The pictures are hard to look at, and what I'm going to do is show you some reports. You can all ask for the report from your cardiologist. If we go to the next slide, there are really just a couple of things to focus on.

Left Ventricle		LAU (A4C)		LVOT BW	
LVEDV	127.0 ml	Normal	4.9 cm	LVOT CO	209.0 ml (82 - 100)
LVEDV	127.0 ml	Normal	4.9 cm	LVOT CO	18.9 mmHg (4 - 8)
EF (Frax)	55.6 %	(54 - 74)	3.1 cm	AV Pk Vel	3.14 m/s
LVEDV	85.4 ml	(51 - 108)	1.7 mm	AV Pk Grad	35.0 mmHg (<40)
LVOT GSA	47.36 mm ²	(18 - 48)	1.4 mm	AV Mean Grad	22.0 mmHg (<40)
LVOT	7.8 mm	(4 - 8)	1.2 mm	AV VTI	22.2 cm (14 - 22)
LVOT	1.5 cm	(0.6 - 0.9)	7.0 mm	AVA (Vmax)	2.22 cm ² (3 - 4)
LVOT	0.7 cm	(0.4 - 0.5)	7.0 mm	AVA (VTI)	2.8 mm ² (>3)
LVOT	2.83 mm ²	(2.4 - 3.2)	22.40	AVA / BSA	1.49 cm ² /m ² (>1.8)
LV Mass	1.8 g	(0.6 - 0.8)	22.20 mm	AV Index	0.3
LV Mass / BSA	206.2 g/m ²	(87 - 181)	7.0	AV VTI	22.6 ms
LV Pk (m/s)	3.9 m/s	(1.5 - 2.5)	11.18	AV Pk Grad	4.0 mmHg
LVOT	3.8 cm	(1.5 - 2.5)	3.0 cm	Pulmonary Valve	Normal
Right Ventricle	1.8 cm	Normal	3.3 cm	PV Pk Vel	0.8 m/s
Left Atrium	3.0 cm	Normal	0.85 m/s	PV Pk Grad	1.0 mmHg
LA	1.8 cm	(1.5 - 2.2)	24.5 cm	Pulmonary Artery	0.8
LA / BSA	1.48 cm/m ²	(1.5 - 2.2)	(18 - 22)	LA / Ao	Normal
				IVC Dim	1.5 cm (<2.1)

A complete Transthoracic Echocardiogram was performed.

Findings: 1. Left ventricle cavity is normal in size. Normal global wall motion. Preserved lv systolic function, ef 60%. Normal diastolic function. Moderate lvh. 2. Left atrial cavity is normal in size. 3. Right atrial cavity is normal in size. 4. Right ventricle cavity is normal in size. Normal right ventricular function. 5. <u>Likely bicuspid aortic valve.</u> <u>Severe, eccentric aortic insufficiency.</u> Heavily calcified aortic valve, calcified but healed, vegetation. 6. Structurally normal mitral valve with no regurgitation. E-wave dominant mitral inflow. 7. Structurally normal tricuspid valve with no regurgitation. RVSP not estimated due to lack of tr gradient. 8. Structurally normal pulmonary valve with no regurgitation. 9. No evidence of significant pericardial effusion. 10. Borderline dilated aortic root. 11. Normal pulmonary artery. 12. IVC is normal with respiratory variation.	Conclusions: Left ventricle cavity is normal in size. Normal global wall motion. Preserved lv systolic function, ef 60%. Normal diastolic function. Moderate lvh. Structurally normal <u>aortic valve with no regurgitation.</u> Likely bicuspid aortic valve. Severe, eccentric aortic insufficiency. Heavily calcified aortic valve, calcified but healed, vegetation. Borderline dilated aortic root.
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Before surgery

- “Severe” regurgitation or stenosis

Dr. Chikwe: Before surgery, you’re looking for something that says severe, severe regurgitation or severe stenosis, and that’s really the reason for having the surgery.

That’s really all you need to see. If none of the valves have the word severe next door to them, question what the rationale is for valve surgery. There needs to be severe in a sentence next door to your valve.

27

Dr. Chikwe:

2. Moderately depressed right ventricular systolic function.

3. The mitral valve leaflets are status post repair. A mitral annuloplasty ring is present. No mitral regurgitation seen. The peak transmitral gradient is 2 mmHg.

4. A tricuspid valve annuloplasty ring is present. No tricuspid regurgitation seen. Peak PG is 5 mmHg and PG is 2 mmHg.

5. Normal pericardium with no pericardial effusion.

6. The inferior vena cava is dilated. The inferior vena cava demonstrates no inspiratory collapse, consistent with significantly elevated right atrial pressure (>15 mmHg).

Comparisons:
 Compared with previous TEE on 09/09/21.
 Comparison findings: There has been a change since last exam.
 Mitral Valve: The severity of the mitral regurgitation has improved.
 Tricuspid Valve: The severity of tricuspid regurgitation has improved.

Measurements:			Doppler		
2D/M Mode	Value	Normal Range	Measurement	Value	Normal Range
LVIDd 2D	5.6	4.2 - 5.9 cm	AV Peak Vel	63.0	100.0 - 170.0 cm/sec
LVIDs 2D	4.8	2.3 - 3.9 cm	AV Peak PG	2.0	2.0 - 9.0 mmHg
FS 2D	14.3	25.0 - 43.0 percent	LVOT Peak Vel	64.2	70.0 - 110.0 cm/sec
IVSd 2D	0.90	0.60 - 1.00 cm	LVOT Peak PG	2.0	2.0 - 6.0 mmHg
LVPWd 2D	1.20	0.60 - 1.00 cm	MV E Peak Vel	154.0	60.0 - 130.0 cm/sec
RVS/LVPW 2D	0.8	1.0 - 2.0 ratio	MV A Peak Vel	141.0	100.0 - 120.0 cm/sec

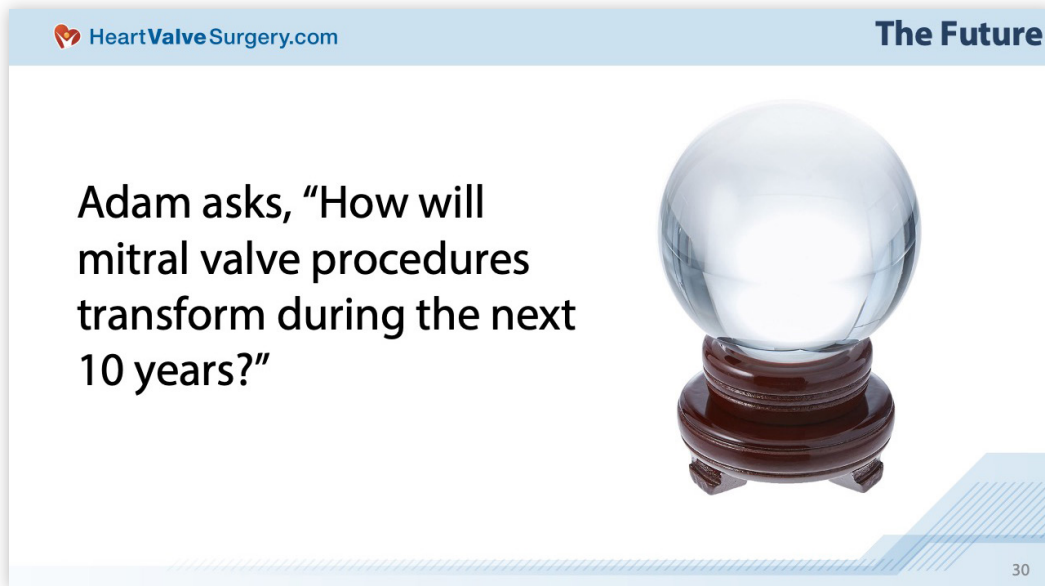
28

After surgery
 • “No” or “Trace”

Dr. Chikwe: The key thing then is to go back and look at your valves. Here’s an echo from after surgery, again, lots of numbers, lots of text. All you want to see is that it says “no” or “trace regurgitation” if you’ve had a repair and that things have improved.

Look for severe before surgery next door to a valve. Look at anything that talks about your left ventricle and see if that’s normal. After surgery, what you want to see is no or trace regurgitation or stenosis. I’ll stop there. People take years to learn how to read echos and me do this in three slides and three minutes is not going to do it justice.

The Future of Mitral Valve Surgery



Adam Pick: When you look out ten years, Dr. Chikwe, how do you see mitral valve therapy transforming?

Dr. Chikwe: So, it ties in with stenosis which, for a long time, we've been able to treat via a blood vessel in the groin, so you don't have to have your chest opened or open heart surgery.

We've only just started extending that to mitral valve regurgitation. This is something I think is exciting. This is the MitraClip, which many of you have already heard of, which is again a way of repairing a floppy mitral valve through a blood vessel in the groin with a clip that essentially clips those two leaky leaflets together.

Clinical Trials for Mitral Valve Disease

Clinical Trials for Mitral Repair

	PRIMARY	REPAIR-MR
Sponsor	NIH	Abbott
Population	All-comers >65 years	Moderate risk
Design	Superiority	Non-inferiority
Treatment	TEER vs. Surgery	MitraClip vs. Repair
Primary endpoint	3-year death, reintervention, heart failure hospitalization, $\geq 3+$ MR	A) 2-year death, stroke, heart failure hospitalization, dialysis b) 2-year $\leq 2+$ MR without replacement or reintervention
Patients	450 - 650	500

Dr. Chikwe: We don't know if that's the right thing for a patient with a floppy mitral valve. It's certainly the right thing for somebody who's too sick for surgery but for somebody who's younger, it's not clear that that's the right thing.

For those of you that are interested in participating in a clinical trial, PRIMARY is a trial that is sponsored by the National Institutes of Health, so that's the absolute gold standard for clinical research in the US. Essentially, we're recruiting all patients over the age of 65 that have mitral regurgitation due to prolapse to find out if a clip or a surgical repair is the best option for them. It's really genuinely exciting, and it's probably the only option for people that want a clip that's not super high-risk for surgery.

Adam Pick: I want to extend a tremendous thank you to Dr. Chikwe for sharing all of her clinical expertise and research with us, and Wendy, I can't thank you enough for being a really an amazing advocate for yourself through your entire surgery journey from diagnosis to recovery. It has been great having you on the webinar. I also would like to thank all the people on the line today. Just by being here, you're making a big difference in your health and our community.

Wendy Spector: Thank you.

Dr. Chikwe: Thank you both very, very much!

HeartValveSurgery.com Resources for Patients

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 dis-ease 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.