



Webinar Transcript

Timing Heart Valve Surgery



Webinar Speakers

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I. Introduction

Dear Patients & Caregivers,

As patients with heart valve disease are often confused about the progression, the management and the treatment of valvular disorders, Northwestern Medicine and HeartValveSurgery.com held a live, online webinar titled, "Timing Heart Valve Surgery", to educate patients.

During this live event, Dr. Patrick McCarthy and Dr. Robert Bonow provided critical information about valvular disorders including aortic stenosis and mitral regurgitation.

Our webinar was an overwhelming success with over 325 registrations from patients all over the world. During the webinar, Drs. McCarthy and Bonow shared their clinical experiences, their research, and their patient success stories.

If you were unable to attend this special event, I prepared this eBook to help you learn more about the timing of heart valve surgery.

Keep on tickin!



Adam Pick
Patient, Author & Website Founder

II. Webinar Speakers

The featured speakers for the webinar are:



Dr. Patrick M. McCarthy

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[Learn about me.](#)



Dr. Robert O. Bonow

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III. Written Transcript & Presentation Slides

In addition to providing you the written transcript of the “Timing Heart Valve Surgery” webinar, we will also provide you the presentation slides shared during the online event.

Webinar Introduction

Speaker: Adam Pick



The slide is a purple rectangular graphic with white and red text. At the top left is the HeartValveSurgery.com logo, which consists of a red heart icon with a white 'V' inside, followed by the text 'HeartValveSurgery.com'. Below the logo, the text 'Patient Webinar' is centered in bold black font, followed by '“Timing Heart Valve Surgery”' in a larger, bold black font. Below that, in red italicized font, is 'The Webinar will begin at 4:30 PM CST'. Further down, the text 'Webinar Speakers' is centered in white. Below this are three headshots of men. Under each headshot is their name and title in white text. The first man is Dr. Patrick McCarthy, Cardiac Surgeon, Northwestern Medicine. The second man is Dr. Robert Bonow, Cardiologist, Northwestern Medicine. The third man is Adam Pick, Patient & Website Founder, HeartValveSurgery.com.

HeartValveSurgery.com

Patient Webinar
“Timing Heart Valve Surgery”
The Webinar will begin at 4:30 PM CST

Webinar Speakers


Dr. Patrick McCarthy
Cardiac Surgeon
Northwestern Medicine


Dr. Robert Bonow
Cardiologist
Northwestern Medicine


Adam Pick
Patient & Website Founder
HeartValveSurgery.com

Adam Pick: Hello, everybody. I'd like to welcome you to the webinar titled, “Timing Heart Valve Surgery”. If I have yet to meet you, I'm a former patient and the founder of HeartValve Surgery.com. Our mission is to educate and empower patients with heart valve disease. This webinar, which had over 300 registrations from patients in countries all over the world, was designed to support that mission. During the webinar, all participants will be in 'listen only' mode. That being said, you may submit questions during the webinar. Simply post your questions in the control panel that is on the top right part of your screen. We'll do our best

to address your questions during the Q&A section of the webinar. Lastly, at the end of the webinar, we're going to ask you to complete a very quick five-question survey about this event.

I am thrilled to introduce the featured speakers of the session. Dr. Patrick McCarthy is the Executive Director of the Bluhm Cardiovascular Institute and the Chief of Cardiac Surgery at Northwestern Medicine in Chicago. Dr. McCarthy has achieved national and international recognition in the fields of complex adult cardiac surgery including valve surgery and atrial fibrillation. He has performed over 10,000 heart operations, of which more than 4,000 involved valve therapy. Dr. McCarthy is also the #1 patient-recommended heart valve surgeon at our website.

Dr. Robert Bonow is a world-renowned cardiologist at Northwestern Medicine. He specializes in the medical treatment of valve disease. Dr. Bonow is a past chair of the American College of Cardiology / American Heart Association Task Force of Practice Guidelines of Patients with Valvular Disease.

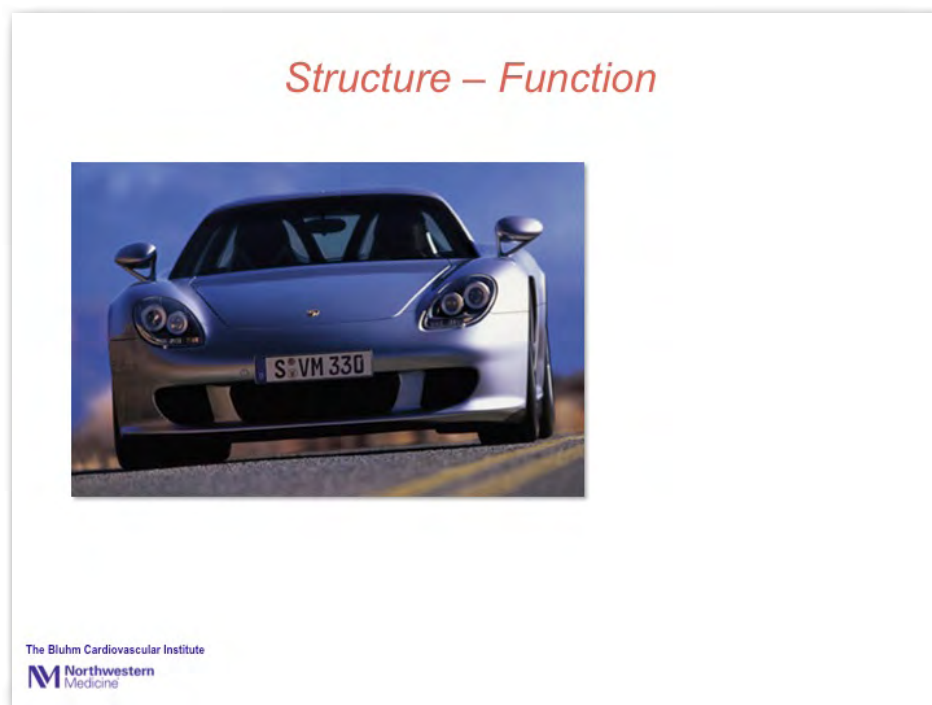


I could go on and on about the careers of Dr. McCarthy and Dr. Bonow and their achievements in cardiac surgery. Instead, I will tell you that these men are celebrated by our community -- and, for good reason. Since launching this website in 2006, Northwestern has successfully treated many patients from our community, including Robert Winter, Sarah Baleakial, Ron Rovin, Gene Cook, Sharon Nickerbocker, Lisa Woods, Mark Herald, John DeFazio, Carole Rice, Charles Woodhartsel, and Debbie Cross.

I am humbled that Dr. McCarthy and Dr. Bonow are taking time away from their busy practices at Northwestern to share their experiences and clinical research during this educational webinar. To start, I would like to introduce you all to Dr. Robert Bonow.

About Your Heart



Speaker: Dr. Robert Bonow



Dr. Bonow: Thank you, Adam. It's a great pleasure to be with you again. We're going to talk about several issues regarding the timing of heart valve surgery. This is a difficult discussion many times for patients and their doctors. One way

to start is to think of your heart as being like a car. I don't drive a car quite like this. I don't think even Dr. McCarthy drives this type of car. The reason I'm showing a car is that this machine is very efficient. It has a motor, fuel lines, valves and an electrical system. Somehow you turn on the car, you put your foot on the gas and... it goes. That's mechanical energy.

Structure – Function

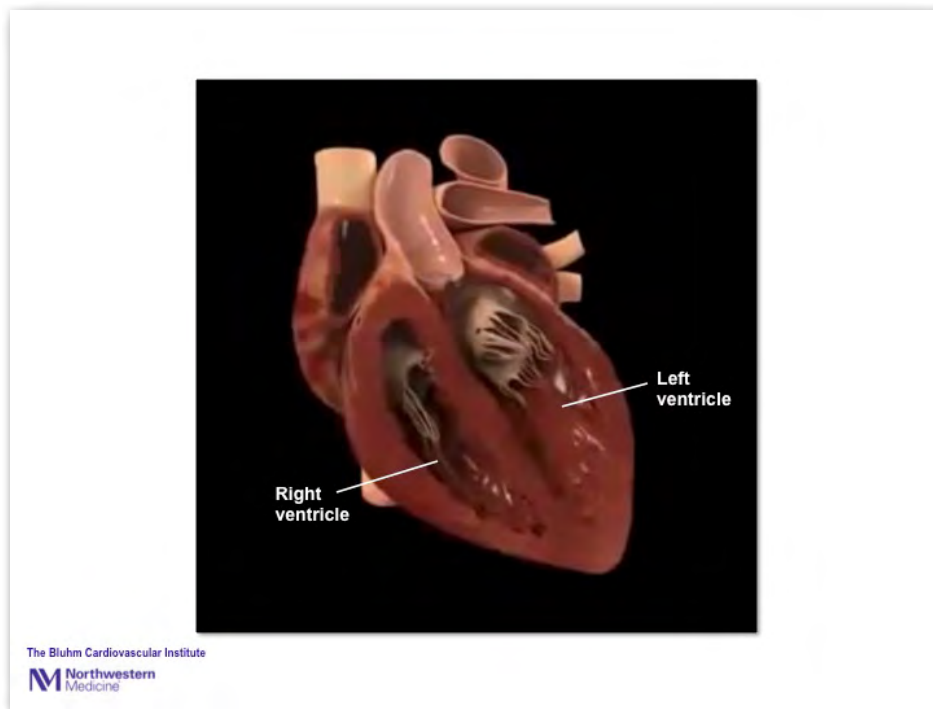


- Motor
- Fuel and fuel lines
- Valves
- Electrical system

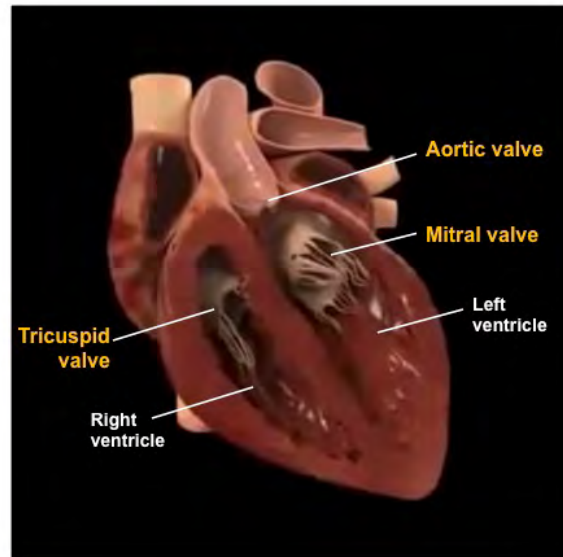
} Mechanical energy

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Your heart works the same way. A heart has all of these same components. When things work well, it's good. Like a car, anything that could go wrong may go wrong. Today, we're going to be talking about the valves. There are four valves inside the heart. On the next page, you will see a view of the heart chambers, the pumping chambers, and the ventricles.



Here, we see the right ventricle and the left ventricle. These are the major parts of the heart. On the next slide, we see three of the four heart valves. Most of the valve disease we see in the United States are disorders of the aortic valve or the mitral valve -- although there has been [an increase in the amount of tricuspid valve disease](#).



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About Your Heart Valves

Speaker: Dr. Robert Bonow

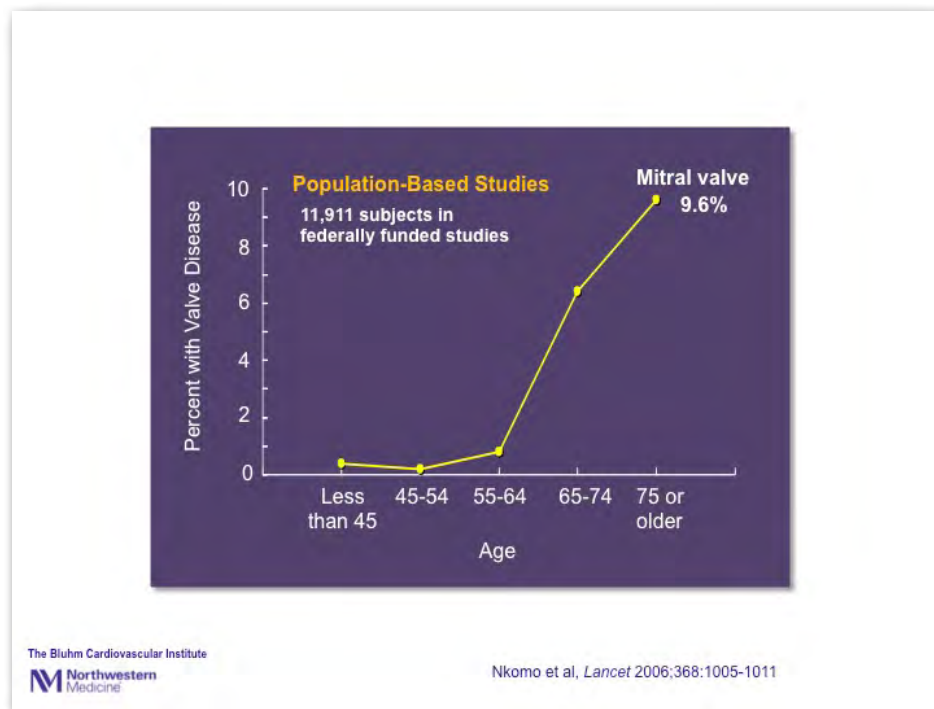
Heart Valves

In the average year:
Heart valves open and close over
40,000,000 times

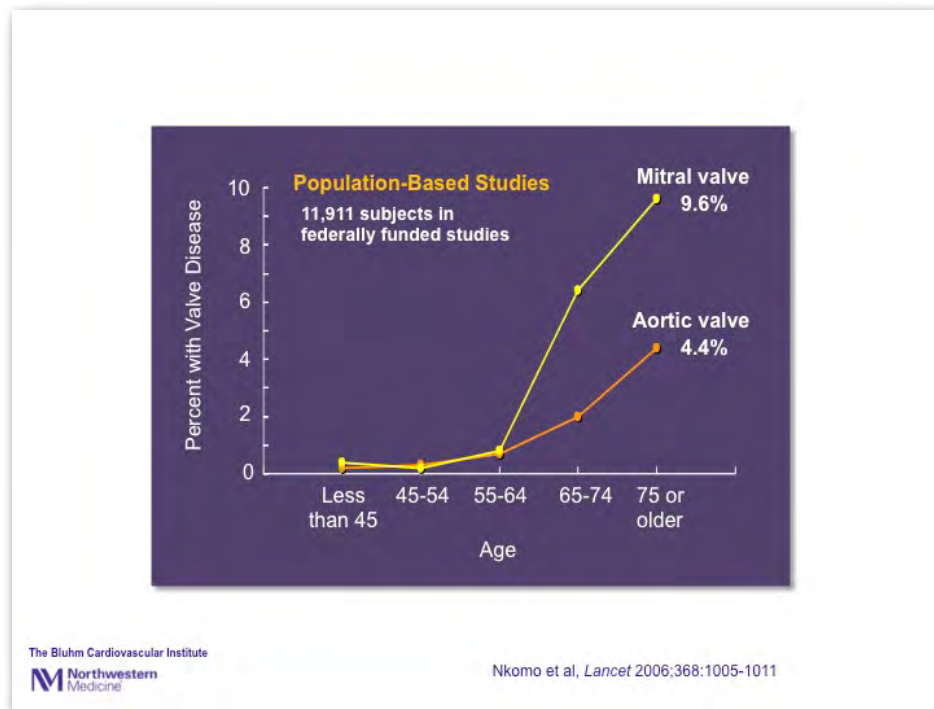
By the age of 65:
Heart valves have opened and closed
over 2.6 billion times

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Heart valves are really important. Your heart valves open-and-close over 40 million times in an average year. By the time you're 65 years old, each valve has opened and closed 2.6 billion times. There's wear and tear that can develop on these valves. Some individuals are born with congenital valve problems (e.g. [bi-cuspid aortic valves](#)). Even a normal valve, through wear and tear, might become problematic. Valves can become **tight like a rusty gait** that does not want to open or valves **may start to leak**.



Given all the opening-and-closing of the valves, it is not uncommon that valve problems may occur. Here is some interesting research that shows that by the time we reach the age of 75, almost **10 percent** of people have a problem with the mitral valve.

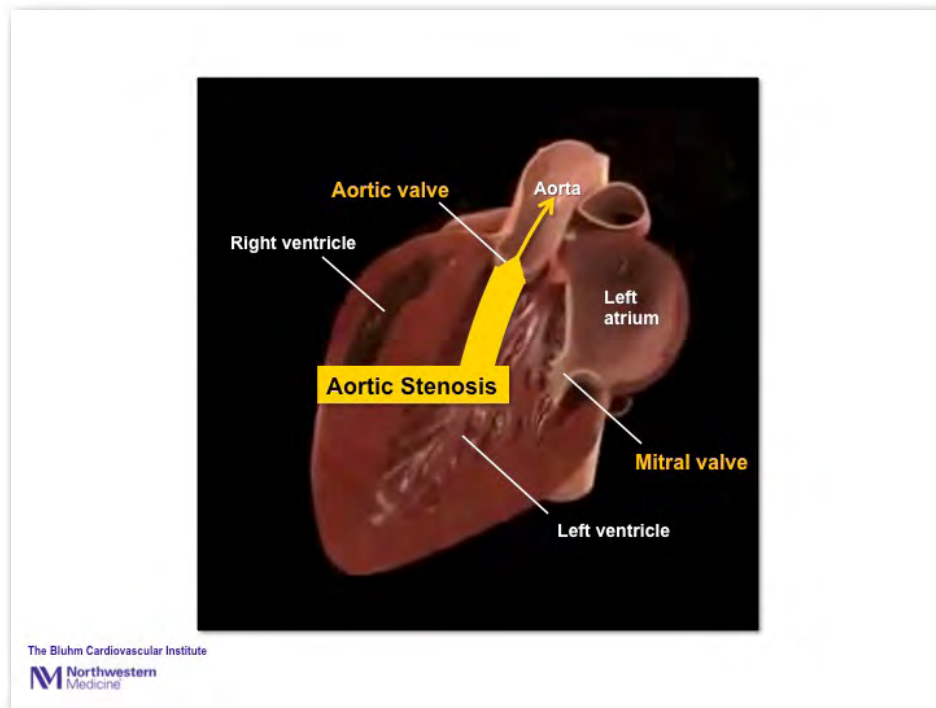


Specific to the aortic valve... As we reach 75 years of age, about **4.5 percent** of people have problems with the aortic valve. Mostly from the wear-and-tear phenomenon.

Now, let's discuss some of the common valvular disorders that we see in our clinic at [Northwestern Medicine](#).

Understanding Aortic Stenosis & Aortic Regurgitation

Speaker: Dr. Robert Bonow



When you develop a disease of the aortic valve, it can act like a rusty gate. It may start getting tight or very narrow -- what we call [aortic stenosis](#). As a result of aortic stenosis, you get a build-up of pressure below that valve as not much blood flows through the valve. It's like putting a nozzle on a hose. You get a higher velocity of blood flowing out that valve because of the tightness of the valve. In fact, that's how we assess how tight the valve is with our echocardiogram -- with the velocity of blood.

Also, the valve can leak ([aortic regurgitation](#)) in which the valve looks like a rusty gate that's stuck open and doesn't close all the way. What happens then is you see blood going back into the major pump of the left ventricle. That's going to make the left ventricle get bigger because of the extra volume going backwards.

Here are the problems that can occur when you've got aortic stenosis. You get a higher pressure in the left ventricle, which causes thickening of the muscle -- as if you're lifting weights. **Over time, that can lead to a weakening of the muscle and cause heart failure.** Because of this problem with those higher pressures, you might get symptoms of shortness of breath, chest pressure or

lightheadedness.

Aortic Stenosis

Consequences:

- Higher pressures in the left ventricle
- Thickening of the left ventricular muscle
- Weakening of the left ventricular muscle (heart failure)
- Symptoms of shortness of breath, chest pressure and/or lightheadedness

Aortic Regurgitation

Consequences:

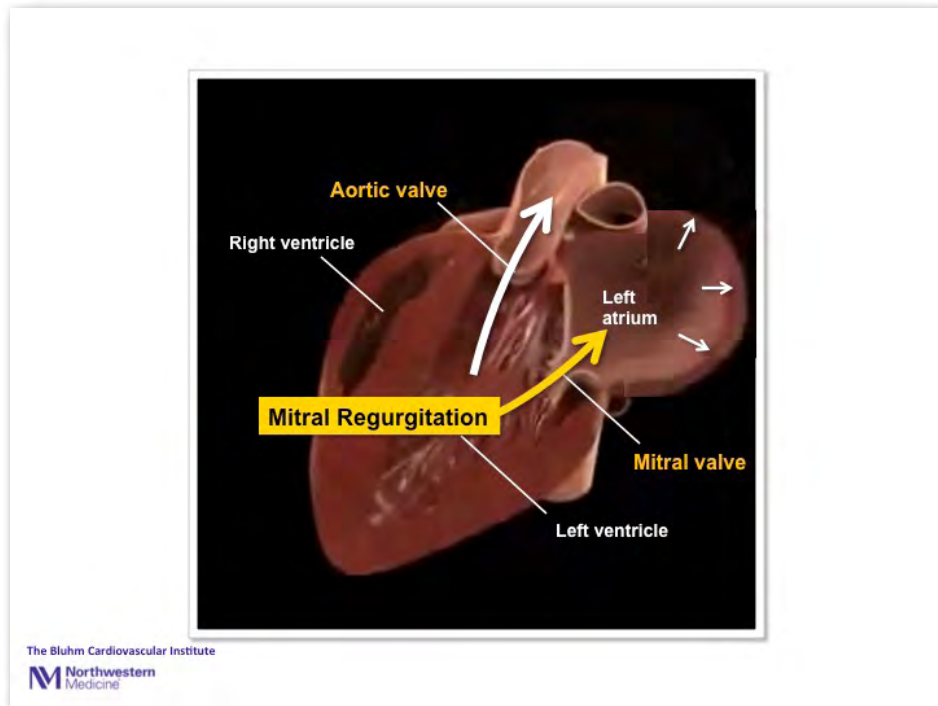
- Enlargement of the left ventricle
- Weakening of the left ventricular muscle (heart failure)
- Symptoms of shortness of breath and/or chest pressure

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If the valve leaks, aortic regurgitation, you get an enlargement of the left ventricle. You've got to keep an eye on how big the ventricle is becoming. That can also make the muscle get weaker over the course of time and the kind of symptoms patients get is shortness of breath and chest pressures. So, for anyone with aortic valve disease -- stenosis or regurgitation -- the symptoms become very important to assessing the valvular disorder.

Understanding Mitral Regurgitation & Atrial Fibrillation

Speaker: Dr. Robert Bonow



The mitral valve can also cause problems. The most common issue is the mitral leaks, known as [mitral regurgitation](#). Because that valve does not close properly, high pressures go back into the left atria which means that not enough blood is going forward. Those heart pressures in the atrium can shift back into your lungs and make you short of breath. In addition, those high pressures also make the atrium get bigger and dilate. When the atrium is bigger, that is a problem because that is when you can start developing rhythm problems in your heart like [atrial fibrillation](#) – that's when the atrium starts to move very fast. Atrial fibrillation can be a cause for strokes.

So the problems with mitral regurgitation are that you can get weakening of the left ventricular muscle because it's working harder to get enough blood going forward, elevated pressures in the lungs, being short of breath, atrial fibrillation from the big increases in the size of the atrium and the risk of strokes. Finally, the high pressures in the lungs can also make the right ventricle begin to malfunction in the tricuspid valve. Dr. McCarthy can talk about that as many times when he repairs the mitral valve, he also has to [repair the tricuspid valve](#).

Mitral Regurgitation

Consequences:

- Weakening of the left ventricular muscle (heart failure)
- Elevation of blood pressure in the lungs (pulmonary hypertension)
- Atrial fibrillation ... and risk of strokes
- Tricuspid valve regurgitation

Goals For Managing Heart Valve Disease

Speaker: Dr. Robert Bonow

Valve Disease

The goal is to operate:

- Late enough in the natural history to justify the risks of intervention

... but early enough to prevent irreversible ventricular dysfunction, pulmonary hypertension or chronic arrhythmias ... **and premature death**

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As cardiologists, it is our job when seeing patients with valve disease to determine the best time for our patients to have surgery. We want to do this late enough that it justifies the risks of intervention. But, we also want to do it early enough to prevent irreversible muscle dysfunction in the ventricle, high pressures in the lungs, pulmonary hypertension or chronic rhythm problems.

In some cases... We want to do it early because if we operate early, you can help patients live longer. We can prevent premature death.

Here are some common questions patients have about timing heart valve surgery:

1. How rapidly does valve disease progress? It's highly variable – it's usually a slow progressor, but we need to keep an eye on this. It's hard to predict exactly

how rapidly a valve deteriorates. You should see a cardiologist frequently – at his or her discretion to have these tests done periodically.

2. Are there medications to delay progression? Not really. Valve issues are plumbing issues. There's no medicines to make things structurally normal and either prevent narrowing or leaking.

3. Do risk factors accelerate progression? They do, particularly aortic stenosis. If you have a high cholesterol or if you're smoking, that can make the aortic stenosis get worse quickly.

4. Is imaging useful? Absolutely. We can do [echocardiograms](#). Sometimes we do magnetic resonance imaging tests. Sometimes CT scans to characterize what the ventricles are doing, how tight the valves are, how weak they are and how often depends upon the severity of the problem and whether things are showing signs of progression. Sometimes we do echocardiograms every two years. Sometimes we do echocardiograms every four to six months.

5. Are there other tests we use? Not really. Sometimes blood tests can help. Blood tests can help tell how hard the heart is working. We can talk about that later. These are called *biomarkers*. The major tests are imaging tests. Second opinions are very important. We see many patients who come here for second opinions. We always recommend to our patients with difficult decisions to get all the information they can. Get good credible advice from people who know a lot about heart valve disease.

6. Do physician guidelines help in managing valve disease? We believe they do. They standardize the care of our patients. The guidelines help you quantify the way that the physicians are talking with their patients and, ultimately, sending our patients to good surgeons like Dr. McCarthy.

I think at this point I'm going to turn the microphone over to him, Adam, so that he can tell you how he addresses many of these questions also.

Surgeon Perspective: Valve Management Guidelines

Speaker: Dr. Patrick McCarthy

The slide is titled "The Impact of 'Guidelines' A Surgeons Perspective". It features a bulleted list of five points. The first two points are in grey text, and the last three are in yellow text. The Northwestern Medicine logo is in the bottom left corner.

- Very Helpful Regarding Timing
- Helpful Regarding Patient Counseling, Especially When No Symptoms
- **Less Helpful; Multiple Valve Disease**
- **Less Helpful; Defining a "Center of Excellence" Especially for Aortic Disease**
- **Less Helpful; Choice of Valve**

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Dr. McCarthy: First, I want to thank Adam once again for all that he does for the patients in this community. Wednesday is my office. I saw ten new patients today and I think three of them were holding [Adam's book](#) when I walked in to see them. Not only is it good to get patients information, but also to get them the right information which is easier said than done. Bob had referred earlier to the impact of the guidelines. I wanted to give the surgeon's perspective.

First, these are essentially a guide that is published by the American Heart Association and the American College of Cardiology. Dr. Bonow was the lead author for years on this. Today, he's still one of the people that is on the Guidelines Committee. It's a group of experts that get together to try to come up with what should, in a sense, be the rules for when patients should have surgery. They are called guidelines, not absolutely laws, or rules, because every patient is different and we have to customize treatment depending on the patient. My perspective is that most of the guidelines are very helpful regarding the timing of surgery. In particular, when we're talking to a patient about when to operate on a patient, it

comes in very handy.

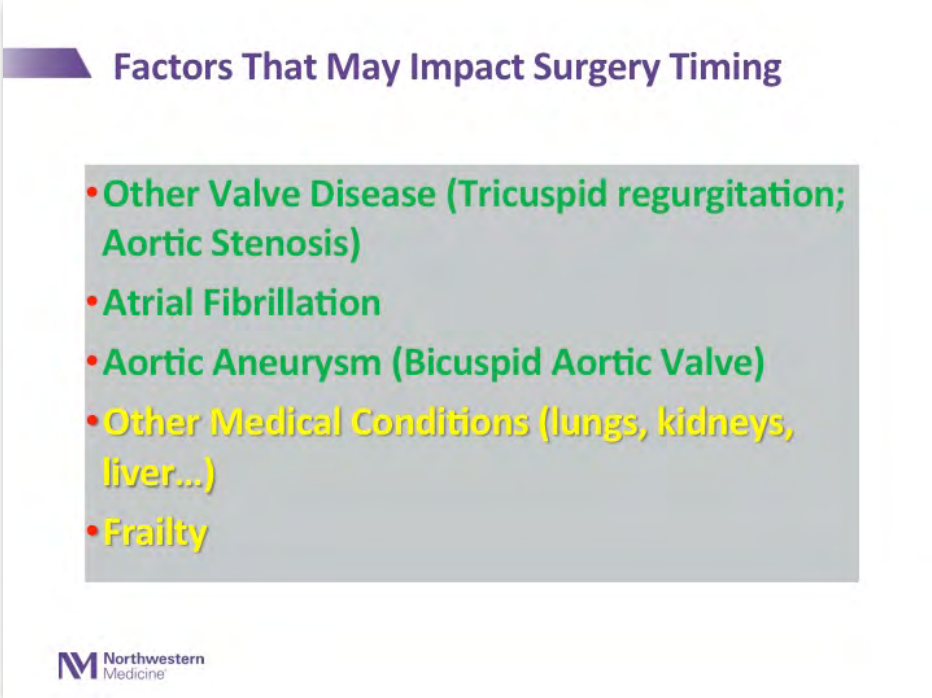
Guidelines for Asymptomatic Patients

The situation where the guidelines are most handy is when patients have no symptoms. They're asymptomatic. They feel fine. I see patients that run two or three miles a day. They've been exercising. They and their spouse, or significant other, say that they haven't noticed anything different -- no symptoms. For that group of patients, they have to go through an open-heart operation. *It helps to know that we've really reviewed this with a group of experts and come up with reasons why people -- with no symptoms -- may need to have surgery.* They're not always helpful. I guess I would say less helpful. The guidelines are described almost as if you only have aortic stenosis, mitral regurgitation or mitral stenosis. Some patients have diseases involving two or even three heart valves. They may have a leaky valve here and a narrow valve there. Sometimes, it's a little bit more complicated to determine the next steps.

Patients may develop symptoms even though each valve may not be so bad that we would need surgery. Also in the guidelines, they talk about a **"Center of Excellence"**. In particular, if you're going to operate on a patient that has no symptoms and put him through a life threatening surgery, you want to make sure that they're going to have as low risk of an operation as possible -- with the best possible long-term outcomes. Especially for the aortic valves and aortic aneurysms, we haven't defined that yet. In addition, the choice of valve, we essentially leave it up to the patient -- if we have to replace the valve. The guidelines provide some perspective on valve choice. But, ultimately it comes down to a discussion with the patient.


Factors Impacting Surgery Timing

Speaker: Dr. Patrick McCarthy



Factors That May Impact Surgery Timing

- Other Valve Disease (Tricuspid regurgitation; Aortic Stenosis)
- Atrial Fibrillation
- Aortic Aneurysm (Bicuspid Aortic Valve)
- Other Medical Conditions (lungs, kidneys, liver...)
- Frailty

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There are different factors that can impact the timing of heart valve surgery. For example, if I see a patient with mitral regurgitation and tricuspid regurgitation, that's going to push me towards earlier surgery because I know that that valve is pretty advanced, the pressure in the lungs must be going up causing that second valve to leak. Where if a patient has aortic stenosis, and we're also seeing a mitral valve leaking related to the aortic stenosis, we know that the other valves can be a symptom that the patient is also developing problems.

Bob mentioned **atrial fibrillation**. The atria are the upper chambers of the heart and they frequently become enlarged in heart valve disease and then they fibrillate -- which means they quiver. They don't contract the way that they are supposed to. You can form a blood clot. The blood clot can break off and cause a stroke. You hear the Pradaxa commercials on the news at night all the time about that. If a patient has enough valve disease that they've formed atrial fibrillation or they've developed atrial fibrillation, another factor that may say it's time to operate on that patient.

There's a specific condition called **bicuspid aortic valve**. John Ritter, the comedian, had that. Two percent of people are born with only two leaflets, or abicuspid aortic valve, instead of the normal three leaflets. They also may form an aortic aneurysm. The aorta is the big blood vessel that leaves the heart and if enlarged, you're at risk for other complications from an aneurysm such as rupture or the layers may split. There's other things that also impact the timing.

Some things may make us less prone to surgery. For instance, you heard from Dr. Bonow about how many patients may be elderly; they're well into their 80s. I saw a 90-year-old patient earlier today. Some of those patients have kidney problems such that we worry that they may go on dialysis if they have surgery. They have emphysema. Earlier, I saw two patients that I thought perhaps had early cirrhosis that also can impact the risk of an operation. Those are the types of factors that we have to take into account as we talk to individual patients about what's the risk and what should the timing be of surgery.

Another factor is **frailty**. Earlier today, I saw an 89-year-old patient who had been chopping wood three months ago. I also saw a woman who was 85 who has a bad back and arthritis. She really hasn't been able to be very active for many, many years. For her, the risk of an operation is going to be higher. She'll have a harder time recovering from someone who may be very vigorous.

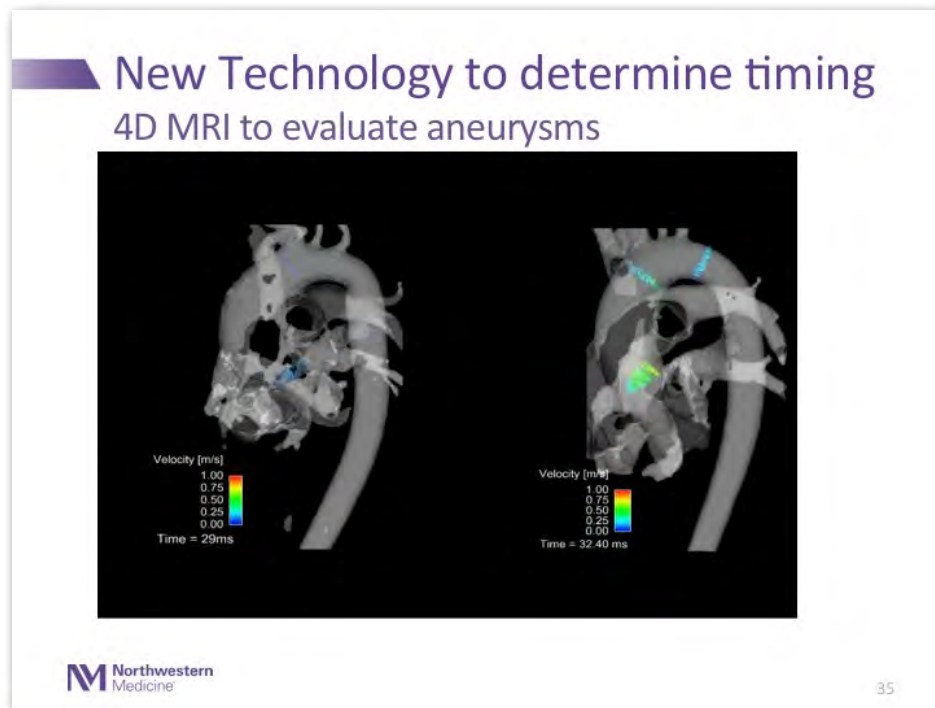
Adam Pick: Dr. McCarthy, it's Adam. I have a quick question for you. Is it common that you operate on patients with more than one valve issue or is it not so common?

Dr. McCarthy: It's actually quite common. I would say probably 25 percent of my heart valve operations have at least two valves. It's not that uncommon that we'll do three. It may be patient referrals that the cardiologist say this is pretty complicated. It's going to be two, maybe three valves and so they send them here,

but one valve can cause a leak or a disease and another valve – like in patients with rheumatic fever, they have more than one valve involved. So, it's not that uncommon that we see at least two valves that need treatment.

Technology Used To Determine Surgical Timing

Speaker: Dr. Patrick McCarthy



Dr. McCarthy: There's a lot of new technology that we use to help us determine the timing of surgery. I mentioned the bicuspid aortic valve disorder. On the right is a patient with a normal aorta. Those different colors are indicating the flow pattern. Think of them as being like jets of blood. Normal, on the right, is as if you have a garden hose and it's just jetting out of there. On the left, is a patient with an aneurysm. You may be able to appreciate how the blood swirls around in there on the left. It's very abnormal and in that group. It's almost like you put your finger over the hose and then there's a jet that comes out of it and it hits the wall of the aorta. It can contribute to forming an aneurysm. It causes wall stress. This is a very new kind of image that we're using them to help us determine the timing of heart valve surgery.

Using Second Opinions

Speaker: Dr. Patrick McCarthy



Second Opinions

- Too Early?
- Too Late?
- More Risk than Benefit?
- Experience?
- Other Issues: Atrial Fibrillation (Maze);
Coronary Artery Bypass (CAB); other
valve?
- Minimally Invasive/Robotic?

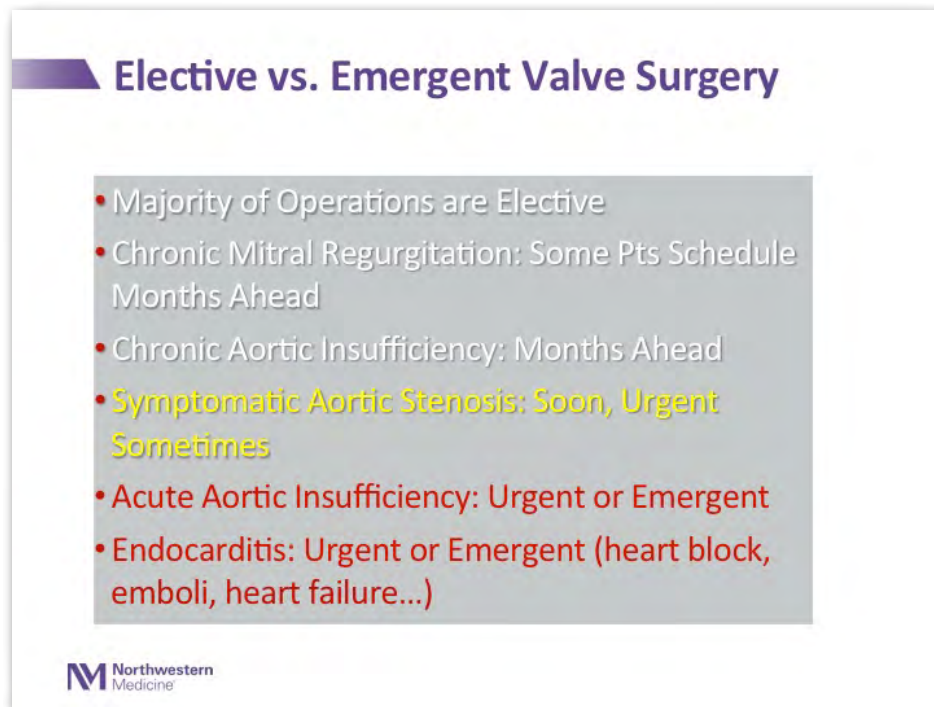
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Second opinions came up earlier. I think three of the ten patients I saw today were there essentially for a second opinion. Are they having surgery too early? Other patients have been turned down for surgery because they were told it was too late. In some, you have to take into account their age and other problems. Is there more risk to the surgery than there is a benefit? You want to [find a surgeon](#) that does a lot of heart valve surgery. Some surgeons do almost all coronary artery bypass. Others do more heart valve surgery.

Some other issues I mentioned was atrial fibrillation. You can treat that with a Maze procedure. Sometimes patients need a coronary bypass. Maybe they do, maybe they don't, and whether they need that second valve or a third valve are other issues that we hear about a lot. People come to us a lot about minimally invasive or robotic approaches. I just always tell people the things I have in mind is, **"What is the safest operation for the patients?"** and **"What's going to be the most effective surgery?"** That's the primary part. Then, we decide whether we can do that minimally invasive or not.


Elective Versus Emergent Surgery

Speaker: Dr. Patrick McCarthy



Elective vs. Emergent Valve Surgery

- Majority of Operations are Elective
- Chronic Mitral Regurgitation: Some Pts Schedule Months Ahead
- Chronic Aortic Insufficiency: Months Ahead
- Symptomatic Aortic Stenosis: Soon, Urgent Sometimes
- Acute Aortic Insufficiency: Urgent or Emergent
- Endocarditis: Urgent or Emergent (heart block, emboli, heart failure...)

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It comes up that most operations are elective or you have an emergency valve surgery. The vast majority of operations are elective. Some of the patients I saw today are going to be scheduling their surgery in a month or two. In particular, a leaky mitral valve – those patients may be pretty much asymptomatic. So, they may be waiting quite a while. The same with aortic insufficiency, that leaky valve. Patients with aortic stenosis, where the valve doesn't open very well – many of those patients may be developing chest pain, which is angina. They may be very short of breath, which is a sign of heart failure, and occasionally they'll even start to pass out. Those procedures can be urgent. Sometimes we even put the patient in the hospital.

For those patients, we'll try to operate within 30 days. If they have a leaky valve like acute aortic insufficiency from an infection – endocarditis – many times that group of patients may need emergency surgery like that night or the next day. That could be from heart failure or blood clots forming which is called emboli or heart blocks. That means that they need a pacemaker.

Elective vs. Emergent Valve Surgery

At NM from April 2004-June 2014

4579 Valve surgeries performed

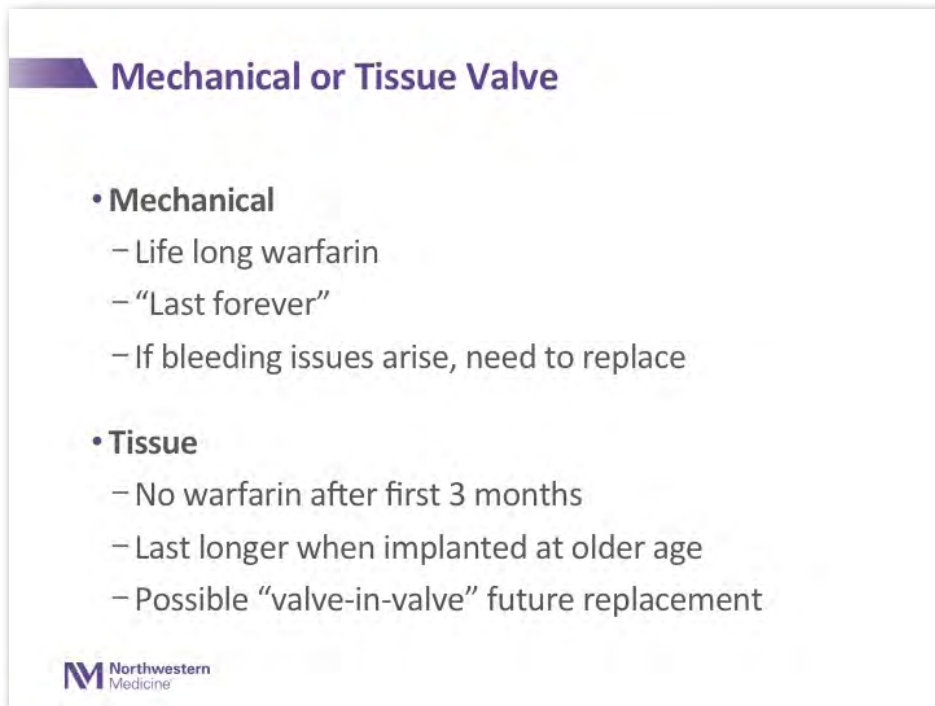
- 3808 (83%) elective—evaluated and scheduled as outpatient
- 671 (14.6%) urgent—in hospital, surgery before discharge
- 100 (2.2%) emergent/salvage



Since I knew that we were going to talk about this, I asked Jane Kruse, our valve clinic coordinator, to pull some data about elective versus emergent cases. For the past 10 years, there's about 4,600 valve operations. 83 percent are elective. About 15 percent were in the hospital for various symptoms. So we needed to do surgery before discharge. Only 2 percent are true emergencies where there's some serious infection or other reason that they need surgery right away.


Heart Valve Replacement Options

Speaker: Dr. Patrick McCarthy



Mechanical or Tissue Valve

- **Mechanical**
 - Life long warfarin
 - “Last forever”
 - If bleeding issues arise, need to replace
- **Tissue**
 - No warfarin after first 3 months
 - Last longer when implanted at older age
 - Possible “valve-in-valve” future replacement

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If we have to replace the valve, which we do sometimes, especially with the aortic valve, patients wonder if it should be a mechanical or a tissue valve. Neither are perfect. Both have their pluses and minuses. With the mechanical valves – the problem is you have to give the patients warfarin (or Coumadin) forever. The good news is that the valve will theoretically last forever. Sometimes bleeding issues come up and then we have to take the valve out and change it because the patient can’t actually be on warfarin. There is a risk of a stroke associated with mechanical valves. In general, mechanicals are not as popular as they were 20 years ago.

With tissue valves, for most patients, you can get rid of the warfarin after three months. **The older the patient is... The longer the tissue valve will last.** We frequently tell a patient of 80, on average it’ll last about 30 years. Come back and find me when they’re 110. For the older patients, almost all of them will receive tissue valves. Even younger patients... Because if you’re in your 50s, you may be able to get a so-called **valve-in-valve procedures** which is a way to replace heart valves without surgery through a catheter. We’re already doing that.

Tips For Watchful Waiting

Speaker: Dr. Patrick McCarthy

Watchful Waiting Advice

- **Watch it! Don't forget to come back**
 - Stay with the Same Center/Imaging; Apples to Apples Comparison
 - Occasional Stress Echo
- **Report new/worsening symptoms right away**
 - Fatigue
 - Shortness of breath
 - Swelling in ankles or abdomen
 - Chest pain
 - Dizziness or passing out
 - Heart rhythm changes

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Some patients that have no symptoms and have a leaky mitral valve enter a phase that we call "Watchful Waiting". **I guess the advice here would be if you're in watchful waiting, make sure you really are watching it.** Every once in a while, we see someone that was told in 2011 that we'll just keep an eye on it. Come back in six months. The problem is they didn't come back for about three years. During that time, their heart may get weak, and they may have developed problems that may be irreversible.


Another potential issue is that patients should probably not shop around. Going to multiple cardiac centers for tests can be confusion. Apples to apples comparison is always the best. We use a stress echo to help determine that. Then, if a patient develops symptoms, they should let us know right away -- in particular fatigue, shortness of breath, any swelling, chest pain, dizziness or passing out, heart rhythm changes which the patients may feel that their heart's pounding, that sort of a thing.

Patient Success Story

Speakers: Dr. Patrick McCarthy & Dr. Robert Bonow

Success Story
Mitral Valve Disorder

- Mitral valve prolapse, severe mitral regurgitation in 33 year old woman
 - 2005-2013: exercised >13 minutes on stress echo
 - Echo every 6 months, stress echo every year
 - Cardiologist visit annually
- 2013 echo showed left ventricle dilating, heart rhythm disorders
- Mitral valve repair by Dr. McCarthy
- Symptom free, left ventricle returned to normal

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Let's discuss an patient that summarizes a lot of this conversation. This was a patient that Dr. Bonow had been following for a few years. She had [mitral valve prolapse](#) which is common. It's in about two percent of the population. When Dr. Bonow first saw her, she was 33 years old. She was a very good patient. She worked with Dr. Bonow. She came back regularly and was doing fine. Then, her heart started to dilate -- so the valve is leaking, the pump is working overtime so to speak, and then she started to develop some irregular heartbeats. I did a heart surgery that was pristine. It was done about a year ago and she's doing well. Afterwards, she recovered. **Her heart muscle, which was starting to dilate, had gone back to normal.** That's an example of a patient that we really followed carefully.

Dr. Bonow: I saw this patient recently. She's returned to kickboxing. She's really very active now since she's had that surgery. She's not competitively kickboxing – she doesn't want to get kicked in the chest. But, she's doing a lot of good exer-

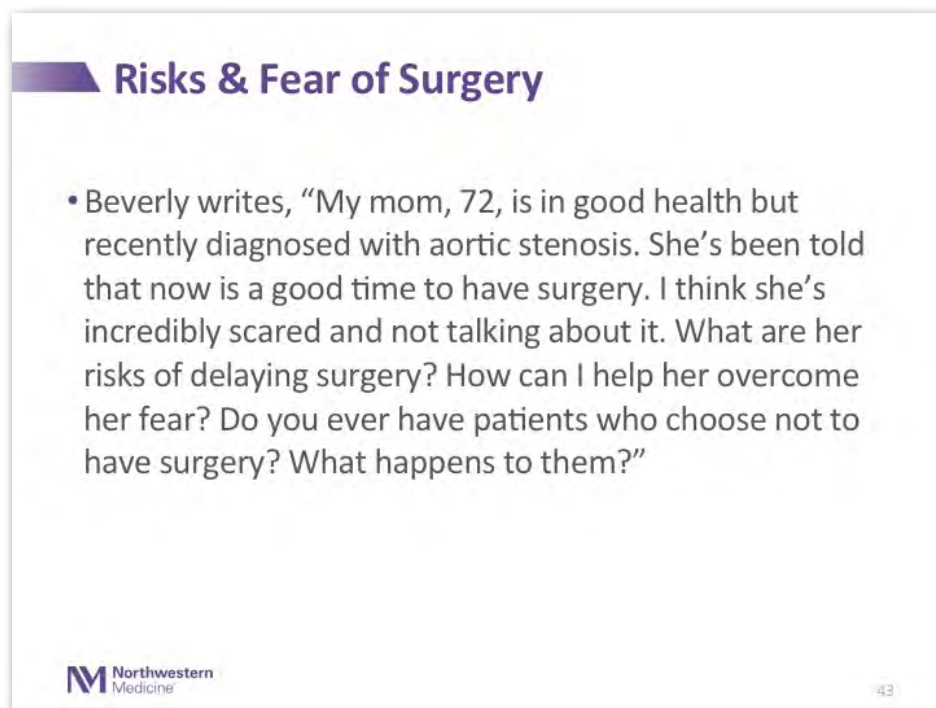
cise now.

Dr. McCarthy: Adam, I think that's our last slide isn't it? We'd be happy to answer any questions.

Questions & Answers


Speakers: Dr. Robert Bonow, Dr. Patrick McCarthy and Adam Pick

Question: Beverly writes, “My mom, 72, is in good health but recently diagnosed with aortic stenosis. She’s been told that now is a good time to have surgery. I think she is incredibly scared and not talking about it. What are her risks of delaying surgery? How can I help her overcome her fear? Do you ever have patients who choose not to have surgery? What happens to them?”



Risks & Fear of Surgery

- Beverly writes, “My mom, 72, is in good health but recently diagnosed with aortic stenosis. She’s been told that now is a good time to have surgery. I think she’s incredibly scared and not talking about it. What are her risks of delaying surgery? How can I help her overcome her fear? Do you ever have patients who choose not to have surgery? What happens to them?”

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Dr. Bonow: This is a great question and it’s a real life example of what we deal with every day. I’ll try to say not too much specifically about Beverly’s mother -- since we don’t know all the details. But, let’s assume that she’s otherwise healthy, doesn’t have a whole lot of other medical problems going on. **I have a very low threshold for sending a patient who’s got severe aortic stenosis to Dr. McCarthy because the risk in a person such as this of having a major complication for dying with surgery is under one percent. If you wait instead until people have heart failure or more severe symptoms, you may**

be waiting too long.

Now if she already has symptoms, then she definitely needs to have surgery now. Because most people who have symptoms, there's a risk of dying from this. We don't want to scare people. This is why we look for symptoms because once people have symptoms with aortic stenosis, there's a clock ticking and a dark cloud that begins to grow over your head. We don't want to wait too long. Now if she decides not to have surgery, I think it will depend again on the circumstances. If she has symptoms and is not having surgery, I'd be really concerned about that. What happens is then that the patients may die or the symptoms get worse. When we do do the surgery, you may have gotten to the point where you don't get the kind of result you would hope for otherwise.

If she has no symptoms, then this is where getting good opinions from other people about the real indications for surgery, might be helpful. Is it really the right time or not? This is where you'd want to have good input from a lot of good experts and trust the people you're dealing with. The most important thing is you have good trust in the doctors that you're working with, that they have expertise and the best treatments available and to give you the advice you need.

Dr. McCarthy: Adam, I think this is a good question. I'll actually speak to the fear part of this because I told people I'd be a little worried if someone weren't a little afraid going into open heart surgery. We see this question all the time. What I tell people is probably the best way to deal with it is to just go and actually meet a surgeon and talk to them about it. The reason being that people kind of have it in their head about how risky surgery is. They may be thinking of things from 30 years ago. Or, a friend-of-a-friend in 1990 had a bad outcome or something they saw on TV.

For instance in this patient, without knowing what the full story is, as Dr. Bonow said, **the risks to her life would be less than one percent**. Surgery would take about three hours. She'd probably be in the hospital about four or five days. The risks for complications, like infection, is less than one percent, bleeding about two percent, heart attack or stroke for a pacemaker about one percent.

A lot of times people come in and they're very scared and then they hear about the process and what it's like. They go home feeling a lot better and they're okay and have an attitude of, "Let's get this over with".

Dr. Bonow: **Normally the discussion we have with patients is that this is not going to go away and it's not going to get better. It's only going to get worse with time.** If she's in good health, now at age 72, and we wait until she's 78 or 80 and she's older and has more clinical problems and her heart disease has gotten worse, the risk to surgery is going to go up. This may be a better time to do it now -- when the risks are quite low.

Adam Pick: You both referenced the mortality rates here being very, very low at one percent. Is that standard across all cardiac centers? Is that at [Northwestern Medicine](#)?

Dr. McCarthy: That is data published from Northwestern. Dr. Chris Malaisrie wrote that up a few years ago. I think our mortality rate was 0.8 percent. I did refer to that Center of Excellence idea earlier where it's practice makes perfect. If you do it a lot, you get better at it. I think we do have very good results. A lot of places do though. But, if you look across the entire United States, and that's called the STS database – you'll hear about that – but that operation, they appear to be at 3 percent. Three percent is certainly higher than one percent but for a patient who is otherwise facing a life-threatening condition without surgery, a three percent risk is still safer when having surgery.

Question: Brad writes, "I understand your webinar is about timing surgery, but I want to know when and what technology might develop to eliminate the need for surgery. Any thoughts?"

Technology Updates

- Brad writes, “I understand your webinar is about timing surgery. But, I want to know when and what technology might develop to eliminate the need for surgery. Any thoughts?”

Dr. Bonow: We're in a stage now of transitioning. We're beginning to develop techniques to replace valves or repair valves without open-heart surgery, using techniques with catheters. Dr. McCarthy is heavily involved in a lot of that technology, developing many of the trials. We've had great experience here. At the current time, these techniques are being used on patients who are considered too sick for surgery or who have a high risk for surgery. As we get better with these techniques, we either replace valves or repair valves – undoubtedly in the future the threshold is going to come down to the point where we're getting to do this on people who are less sick.

That's one of the reasons many times where we wait for somebody who's got some valve condition that not's severe. Maybe we don't want to do the surgery now if we can wait safely for another five to ten years. Maybe some new technology could come along. Right now, I still have great confidence sending my patients to an excellent surgeon, like Dr. McCarthy, because of the results we have. It's a proven technology that we have with surgery while some of these new techniques still need to be worked on.

Dr. McCarthy: Adam, I'd say over ten years ago, we first started to [replace the aortic valve without surgery](#) by using a catheter (TAVR) that goes up through the leg. It began in France. TAVR's been growing across the world. When we first heard about it, we thought that it was science fiction. Now, it's approved in the US, but only for patients who are very high risk because there's a risk for a stroke associated with the procedure. There's a risk that you can leak around the valve and that may impact the survival of the patients. We don't know how long the valve itself will last. So, there's still a lot of unknowns about it. It's like 1965 with heart valve surgery. It's just beginning. Right now it's an option for patients that otherwise would have to go through open-heart surgery. Ten years from now, we'll have worked through some of the current issues that we have, it's going to be a little safer, and the technology will be a little bit better. It's not often that I see a patient and say, "There's a technology coming that would show up within a few months. You can afford to wait for it." Because the time line on these technologies usually takes years. So, for a specific patient, many of them usually need an intervention pretty soon and they can't wait for that kind of a technology to change.

Minimally Invasive Surgery

- Patty asks, "I will be having my aortic valve replaced in early December. I am hoping to have the mini surgery. What are the deciding factors for this? I am 56, female and relatively healthy."

Question: Patty asks I'll be having my aortic valve replaced in early December. I am hoping to have the mini surgery. What are the deciding factors for this? I am 56. I'm a female and I'm relatively healthy.

Dr. McCarthy: The deciding factor is going to be who the surgeon is. There are surgeons that do minimally invasive aortic valve replacement and there are others that it's just not something they do. There are procedures that you wouldn't want a mini. For instance, if you also needed a coronary bypass. That's sort of on the bottom of the heart while the aortic valve is up on the top of the heart. It's just that you can't get there from here. If you needed also a mitral valve operation. That may be a little bit harder to do. I would just ask your surgeon.

Can this be done minimally safely? Today, we're probably about 80 percent of the patients are minimally invasive for aortic valve operations. If it's for a patient that weighs 300 pounds, it may be very difficult to essentially see and get in there through a small 2-inch incision. You have to make the incision 3 or 4 inches bigger. In general, for this operation, that's a nice safe operation to do minimally invasive surgery, but not everyone does it.

Valve Tethering

- Alan writes, "I've been diagnosed with severe isolated tricuspid regurgitation. A TEE performed on 9/2/14 shows tricuspid **valve tethering** of septal and anterior leaflet. Heart function still low normal/good with left and right ventricle ejection fractions at 50-55% and I still routinely exercise. I'm asymptomatic. There is some right ventricle/atrium dilation.

- Question: What is tethering?
- Do some of the newer repair techniques for this condition show promise for a long-term fix and under what conditions would a surgeon do a valve replacement for tethering (assume there is probably some annular dilation as well)?"

Question: Alan asks, “I’ve been diagnosed with severe isolated tricuspid regurgitation. A TEE was performed that shows I have valve tethering of septal and anterior leaflet. Heart function is still normal with ejection fraction at 50 to 55, I exercise, and I’m asymptomatic. What is tethering? Do some of the newer repair techniques for this condition show promise for a long term fix and under what conditions would a surgeon do a valve replacement for tethering?”

Dr. Bonow: This is an important question. It’s somewhat technical. We have the mitral valve and the tricuspid valve – they’re complex structures where the valve leaflets are also attached to the muscle of the ventricles through these cords. Now, a valve can leak either because you have a disease of the valve leaflets that we’ve been talking about with mitral valve prolapse or tricuspid valve prolapse. The valve can also leak if the ventricles aren’t behaving properly because these cords pull the valve in funny ways. Even when a valve is structurally normal, if it’s being pulled in a funny way -- this is what we call tethering -- the valve can’t close normally. It’s restricted in its ability to close normally.

It’s like having an old-fashioned army tent with flaps. The flaps are normal, but you stake it in a way that its cords with the flaps out of position. A stiff breeze comes along and you haven’t staked out the tent well enough. The flaps themselves are okay. It’s a problem with the cords and that’s why the valves – the leaflets in this case are not closing normally. They’re pulled or tethered out of position. Usually it occurs in people who have symptoms. Again, we can’t speak to exactly what’s going on here with Alan, but it could be an issue there. Those valves can also be repaired and maybe Dr. McCarthy can talk about how he would approach a problem like that.

Dr. McCarthy: Tethering of the valve with normal right ventricular function and size is unusual. Usually when there’s tethering of the valve, it’s because the right ventricle is dilated and it’s essentially pulling the valve down causing tethering. One of the first things would be to find out is there a different cause for the tethering. Sometimes, there’s inflammatory reasons like rheumatic fever, an old history of that or endocarditis, which is an infection, and there’s an unusual tumor or carcinoid of the liver that can affect the tricuspid valve. If it’s just simple tethering that is doing it, essentially then it’s going to depend on the amount of tethering. There may be just a small amount of tethering and may be pulled down a little bit, but if the [annulus](#) is dilated and if you [put a ring around it](#), you make the annulus smaller and the leaflets will hit back together and they’ll overlap properly.

But, if there's a huge amount of tethering and if there's been destruction of the valve leaflets themselves from rheumatic fever or endocarditis or carcinoid or something like that, that type of patient may need a [heart valve replacement](#). Those are the kind of things we cover with a patient individually before surgery and sort of prepare them for both. It might be a repair depending on what we find, but we might have to replace it.

Smoking & Heart Surgery

- Louise asks, "I've been told I may need surgery in the next 1-2 years. My aorta valve is narrow. I smoke. Is that going to have a negative impact on my surgery and/or recovery?"

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Question: Louise asks, "I've been told I may need surgery in the next one to two years. My aortic valve is narrow. I smoke. Is that going to have a negative impact on my surgery and/or recovery?"


Dr. Bonow: Yes, the good news is that the operation is a ways away. You can quit smoking and get rid of that. I always ask patients, "Do you smoke?" Patients have to go on the heart-lung machine, there's a general anesthetic, you have a breathing tube and the patients that are smokers, that affects the cilia, or the lining of the lung. Their heart may be totally fine, but sometimes their lungs have trouble afterwards. Now, if I see a patient and they're a smoker and they need surgery, we really would like them to quit smoking for at least two weeks before.

If she's told, she may need surgery in the next one to two years, this is a great time to really work at stopping smoking, and doing whatever is available to stop that.

Dr. McCarthy: I would stop now. I would not wait until one to two weeks before hand. That's not a time to stop. Get those lungs all nice and healthy.

Aortic Stenosis

- Linda asks, "I am point eight opening in the aortic valve. All my other valves are healthy. Is it time for me to have surgery?"

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Question: Linda asks, "I have a 0.8 opening in the aortic valve. All my other valves are healthy. Is it time for me to have surgery?"

Dr. McCarthy: Did I hear point eight, Adam?

Adam Pick: Yes.

Dr. Bonow: That's how we would define [severe aortic stenosis](#) and this is a dif-

difficult question, even for someone who has no symptoms. When the valve is that tight, the likelihood of needing surgery over the course of the next five years is very high. Not everybody, but almost everybody, over the next five years is going to start developing something that would push you to do the surgery. It's usually a symptom and if the likelihood is that high, you really don't gain much in waiting. You may lose something in waiting. It's a difficult decision. If you're really doing fine – but as I said before, it's not going to go away. If it's already 0.8 when compared to a normal valve that opens to about 2 to 4 square centimeters. You can start looking at the inside of a fountain pen and that's what it looks like. It's a very small opening. It's only going to get worse and it may get worse quickly. It would not be wrong to have the discussion now about having the surgery while you're healthy.

Dr. McCarthy: Adam, I think Dr. Bonow made in his assumption that there weren't symptoms. **If that patient has symptoms and it is 0.8, it's really time to have surgery because the risk to that patient's life in the next year is actually quite significant.** Even when we have patients that say that they're asymptomatic... When you talk to them for a while they say, "I used to be able to do this but now I'm older and so I don't do that." You're thinking well they're only 75 and so what we do is an **exercise echo** frequently. What we'll do is that we put them on a treadmill and do an echo before. We have someone there to actually watch them as they go through it. We look for how the heart responds to exercise, but also we look to see if their blood pressure drops because that narrow opening is about the size of a dime (or smaller) and as you start to exercise, your blood pressure should go up. If you have that obstruction to the flow, your blood pressure may actually drop when you exercise and in that case, you really should have surgery -- even though you feel pretty good. Again, remember this is a patient population that frequently tell me, you know, I think I must just be getting a little old because I'm tired and I can't do this or that.

Dr. Bonow: It is amazing how many people who say they feel absolutely normal before surgery, feel a lot better afterwards because as Dr. McCarthy said, people stop doing things. They think they have decreased their activity level, sometimes very subtle ways – they think they're just getting older and out of shape. Many times, it's their heart talking to them.

Travel After Surgery

- Tam Nguyen writes, “I currently have bicuspid valve with an aneurysm 4.7. I am planning to have my operation about 8 hours away. Is there any restriction on travel after operation? And how should I plan for follow-up after the trip?”



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Question: Tam Nguyen writes, “I currently have bicuspid aortic valve with an aneurysm of 4.7. I’m planning to have my operation about eight hours away. Is there any restriction on travel after the operation and how should I plan for follow-up after the trip?”

Dr. Bonow: We see this a lot where patients fly to Northwestern for surgery. It’s not uncommon to do that. What we typically do, and obviously it depends on the age of the patient and the condition, and the family members with them... But, if it’s an otherwise healthy patient, frequently what I’ll tell them is they get discharged from the hospital after about five days after surgery; they usually spend a few days here in Chicago. It’s not bad to go to Michigan Avenue and go shopping for a few days anyway. Then, there’s nothing wrong with an airplane. The planes are all pressurized so that’s fine, but they are going to be tired. I tell everyone – that’s going to take a lot out of them to make the trip. The second is they can’t lift anything over 20 pounds. So, either they have to check their luggage or have somebody with them that’s going to do all of that for them.

They’re not supposed to raise their arms over their heads. They shouldn’t be lifting their luggage in the overhead. Sometimes people want to go to Thailand on

vacation a few weeks after surgery. That's probably not such a good idea. But, if it's a young, healthy patient and they can manage the logistics of travel, then we typically let them out of the hospital, see them in two or three days afterwards, and then clear them to fly home.

Question: Roseanne ask, "My son, 18 years old has a bicuspid aortic valve with aortic stenosis and his aorta is enlarged and slight thickening of the heart wall. He also has regurgitation. His stenosis is now in a serious category. He's restricted from lifting weights. The doctor is still waiting for symptoms. He has occasional lightheadedness when standing and doctor knows this, but isn't concerned. He recommends a stress test this spring. We've been monitoring this for five years. I'm concerned that he isn't having surgery soon enough and will miss the symptoms. Thoughts?"

Dr. Bonow: Adam, I hate to weight in from a long distance on this one, but it gets back to this whole point of getting all the opinions you can. It sounds like the mother is appropriately concerned about her son and from what you're describing I would be concerned too. Get all the opinions she can – what's going on with this lightheadedness? That's like you've got tight aortic stenosis and the patient is lightheaded, that sounds like symptoms to both Dr. McCarthy and me. We were looking at each other when you were describing this. I'd be concerned too. Again, I don't want to tell you what to do from long distance, but I strongly would tell you to get all the opinions you can to feel reassured.

Preserving Surgically Treated Valves

- David Clarke asks, “Two weeks ago I had replacement of my aortic root and aortic valve. My question is how do I prevent infection of my pig valve and what precautions should I take to care for it?”

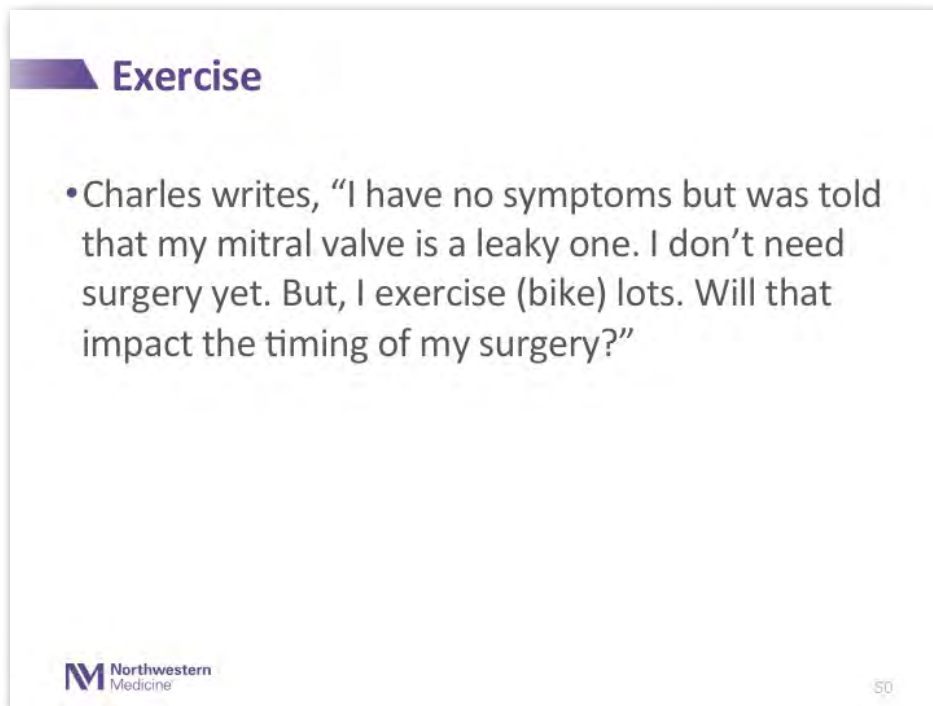
Question: David asks, “I had replacement of my aortic root and aortic valve. My question is how do I prevent infection of my pig valve and what precautions should I take to care for it?”

Dr. McCarthy: Well, this is a great question and goes back to why we just don't recommend replacing valves in everybody who have valve disease. We wait until there's a real indication for it because there is a risk of infection and the infection is somewhat greater after you have had valve surgery done before. It's not that great a risk, however. Therefore, I wouldn't be overly concerned about this. **What we do recommend is that you take antibiotics whenever you're in a situation where you're going to put bacteria in your blood stream and the leading cause for that is seeing a dentist.** We do recommend that you take antibiotics one hour before seeing a dentist. If you can take penicillin without an allergy, it's pretty simple. You take two grams of a drug called amoxicillin, which is a kind of penicillin. That does pretty good at preventing this. It's never 100 percent effective, but the risk is generally in the ballpark of one in a million of getting an infection when you see a dentist. It's not zero, but it's quite low. You can also reduce that closer to zero with antibiotics.

Dr. Bonow: I tell my patients that basically any time they go in to see a doctor,


or ER or anyone that's going to do a procedure, to let them know that they have a heart valve because the dental profession, the medical profession – we're all pretty in touch with that. If someone came in with a fever and a concern for infection somewhere and we knew they had a heart valve, we'd probably be a lot more aggressive about treating it with antibiotics.

Dr. McCarthy: Any time you have a fever, chills, and things – we take that seriously because it could be an infection on the valve. Again, I would not be overly concerned about this. It sounds like you had a good operation, for a good reason. That took a dark cloud away from you and now you've got very little of the dark cloud hanging around you related to the risk of infection.



Exercise

- Charles writes, "I have no symptoms but was told that my mitral valve is a leaky one. I don't need surgery yet. But, I exercise (bike) lots. Will that impact the timing of my surgery?"

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Question: Charles asks, "I have no symptoms, but I was told that my mitral valve is a leaky one. I don't need surgery yet, but I exercise (bike) lots. Will that impact the timing of my surgery?"

Dr. Bonow: Probably not at all. I'm assuming from what you've said here,

Charles that the valve is not leaking severely. That's why they're not recommending surgery yet. If the valve is not leaking severely, exercise will have really no effect on this. We would recommend you don't do a whole lot of heavy weight lifting, but biking and other forms of aerobic activity are quite safe and they're not going to make the valves get any worse any more quickly.

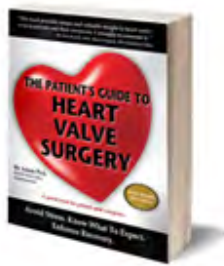
Adam Pick: With that response, as we're running out of time here, we're going to conclude the webinar, but please don't exit just yet. On behalf of the entire community at HeartValveSurgery.com, and all the patients with valve disease, I'd like to extend an extraordinary thank you to Dr. McCarthy and Dr. Bonow for sharing their expertise with us today!!!



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