MARC R. KATZ: The mitral valve is one of the four main heart valves. And mitral valve disease is one of the most common heart problems in the country. The mitral valve can leak, and when it does, it puts extra pressure on the lungs, makes the patient become short of breath, and over time leads to heart failure.

So it used to be that me, as a heart surgeon, wouldn't see patients with leaking mitral valves until they had heart failure. And then we'd have to replace their valves, but as we've learned newer and better techniques for repairing valves, the recommendations from the main societies like the American Heart Association, the American College of Cardiology is that now even if patients don't have any symptoms, if they have a valve that leaks severely, it ought to be repaired.

Currently, my preferred mode of treatment in patients who are eligible is a robotic approach to repairing mitral valves. This affords me better views, better visualization of the valve because the scope is sitting right next to the valve, and the valve looks like it's 10 feet tall. We're able to see parts of the valve using this technique that are not easily seen in traditional open heart approaches, and able to achieve better repair rates because of the better visualization of the valve. Additionally, the patients hospital stay is less than half of what it is with traditional open heart surgery.

So I've spent the last decade and a half working on techniques to improve mitral valve repair. My techniques for repairing the mitral valve include mainly replacement of any ruptured chords and placement of an annuloplasty ring. Only very rarely do I ever resect any leaflet tissue.

Traditional open heart surgery for mitral valve repair, it's an incision through the breastbone. The usual stay in the hospital is about seven days. The patient is then not allowed to drive or lift anything for a month, and no heavy lifting for three months. So in that circumstance, someone who has a job that requires significant manual labor is out of work for three months.

With robotically assisted surgery, we make small ports that are a half an inch to an inch in size, not cutting through any bone. And most of the patients are out of the hospital within about two to three days, and can get back to their full activities within a week or two, with really no physical limitations whatsoever.

I had the third robot in the United States in 2001, and was part of the initial clinical trials that led to its approval for general utilization. I've been working with the system in a variety of modalities since that time. I have gone up through the different generations of the robotic system, have used it in the past for bypass surgery. I use it now most commonly for valve repair surgery, but have used it not only for the mitral valve but tricuspid valve, closure of some holes in the heart, and repair of the tricuspid valve as well.

So robotic-assisted surgery the robot is not operating by itself. It's not some futuristic creature. In reality, it's a tool. And it's an interface that helps-- it's really a computerized interface that is between the surgeon and the patient. The surgeon sits at the console, and the robot does what the surgeon's hands do. And it just follows it. It allows us to translate our normal motions in through tiny incisions into the chest.

So the most common utilization of robotic heart surgery in my practice is for leaking mitral valves, and most of those we're able to repair the mitral valve on. One of the administrators had pulled my data for the last six years, and we were able to repair 99% of the valves that we had intended to repair.

There are some instances where valves require replacement, usually for narrowed valves as opposed to leaking valves. And those we usually know about ahead of time. We're able to do that using the robotic-assisted approach as well. We've also been able to use this approach to repair tricuspid valves, take out some heart tumors, masses that are there, and close some holes in the heart, specifically in the atrial septum, known as ASDs.

So robotic surgery is indicated mainly for isolated mitral valve problems. Patients who need multiple valves still require open surgery, or if they need valve repair plus multiple bypasses, for example, that would require open surgery. We have done some hybrid approaches in patients who have, for example, a blockage in the single artery to their heart where one of the cardiologists works with us. We do the mitral valve repair using the robotic system, then they come into the room and put a stent in the valve at the end of the procedure. So we're able to take care of both things still in a very minimally invasive approach.

I'm excited to offer minimally invasive robotically assisted surgery at MUSC because currently there's no one else in the state doing this. I think it's a great thing to offer the patients in this region a way to achieve both excellent results with shorter hospital stays and quicker recovery. It's something that's been lacking, it's something that these patients deserve, and that I'm glad that we have a great team that we can offer this.