
How are robots improving cardiovascular medicine?



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Robots were first used in cardiovascular medicine in the late 1990s as a part of the [digital revolution](#). Since then, robotics have been applied to endovascular surgery, minimally invasive cardiac surgery, and interventional cardiology, to name a few fields.

Robots give [medical professionals](#) the ability to diagnose, treat, and intervene more efficiently than ever before. Here are some of the amazing ways robots are being used in today's fields of cardiovascular medicine and surgery.

Robots assist in training doctors

Robotic devices are used to help train medical students in a wide range of treatments and surgical techniques. Medical students can practice these techniques on robots without the risk of hurting an actual patient if they make a mistake. Robotic devices can simulate beating hearts, breathing, dilating eyes, and childbirth. Students use these devices to learn how to check vital signs, insert an IV, and deliver babies.

Robots help to diagnose cardiovascular diseases

It's no easy process to get a diagnosis. Masses might be too small to be observed on an X-ray. Trace elements might go undetected on a blood test. In some cases, a diagnostic procedure may be too invasive for an early evaluation. Robotic devices give doctors precise, less invasive diagnostic opportunities. For instance, an echocardiogram is commonly used to diagnose mitral valve regurgitation. A wand-like device (transducer) is held to a patient's chest to produce video images of the heart using sound waves.

Robots allow for less invasive surgeries

An invasive surgery is a procedure involving a large incision. These procedures can take longer to recover from. Robotic surgery allows doctors to perform minimally invasive procedures using very small surgical instruments that fit through quarter-inch incisions. This minimises the risk of infection and reduces recovery time.

One robot that's commonly used in cardiovascular surgeries is the [HeartLander](#). The HeartLander is used to conduct heart surgeries without the doctor needing to open a patient's chest. The robot can sense, map, and treat issues on the entire surface of the heart.

Other cardiovascular surgeries robots can assist with include

- Mitral valve repair
- CABG surgery
- Atrial septal defect repair
- Myxoma resection

Doctors can use robotic technology to perform aortic, visceral, and peripheral artery disease. Robotics can also be used in electrophysiology to conduct ablation procedures for atrial fibrillation.

Robots can regulate a problematic heartbeat

One of the most common cardiovascular conditions is a cardiac arrhythmia. Your heartbeat is regulated by electrical signals that flow through the heart. Arrhythmias are caused by a misfiring of these electrical signals, causing an irregular heartbeat.

When your heart beats irregularly, it causes blood to flow inefficiently throughout the body. Left untreated, arrhythmias can increase the risk of heart failure, cardiac arrest, and stroke.

Robotics have given doctors the ability to treat arrhythmias using implanted devices such as pacemakers. A pacemaker is a small device that's implanted in the chest. Pacemakers deliver the electrical pulses the heart needs to pump at a measured pace. Robotics have also assisted in cardiac ablation procedures. In these procedures, a catheter is navigated through the patient's blood vessels into the heart. The catheter is used to deliver energy to specific areas of the heart to normalise its electrical signals.

Robotic Magnetic Navigation (RMN) allows for safer cardiac ablation procedures because the physician no longer needs to move the catheter by hand. RMN uses magnetic fields and robotics to carefully navigate a magnetic catheter through the blood vessels.

Robotic technology has transformed the way we treat patients and conduct surgical procedures. Future advancements in robotics will not only make medical procedures and diagnoses even more efficient but will also make recovery times that much shorter so patients can return to their daily lives.

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