

First heart patients implanted with next-generation mechanical heart pump

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Three patients at New York-Presbyterian Hospital/Columbia University Medical Center were among the first in the United States to be implanted with a next-generation artificial heart pump called the DuraHeart™ Left-Ventricular Assist System. The surgeries took place earlier this year. New York-Presbyterian/Columbia is one of only three centers in the U.S. currently enrolling patients in a clinical trial studying the device.

The DuraHeart is designed to sustain [patients](#) with severe left-ventricular heart failure while they wait for a heart transplant. Without intervention, they are at risk of death.

The surgeries were led by Dr. Yoshifumi Naka, director of cardiac transplantation at New York-Presbyterian Hospital/Columbia University Medical Center and associate professor of surgery at Columbia University College of Physicians and Surgeons. He elected to implant the device without stopping the heart and putting the patient on a heart-lung machine. This "off pump" approach reduces risk for bleeding and stroke associated with putting a patient on bypass.

"In this clinical trial, we hope to show that this device can help patients retain a healthy and meaningful quality of life while awaiting a heart transplant," says Dr. Naka, one of three national co-principal investigators of the DuraHeart trial. "Eventually, the DuraHeart may also prove to be a long-term solution, even for those ineligible for transplantation."

There are fewer than 2,500 hearts transplanted each year in the United States, while 500,000 to 800,000 patients have advanced heart failure; many do not qualify for transplantation due to other health issues. The average wait for a transplant is nine months due to a shortage of donor organs.

In patients with advanced heart failure, their heart isn't strong enough to pump sufficient blood for normal activities, leaving them greatly fatigued and frequently bedridden with difficulty breathing; [heart failure](#) is the number one reason for hospitalization. Mechanical heart pumps like the DuraHeart are designed to help the heart pump blood from the left ventricle to the aorta, increasing flow throughout the body. Previous research has shown the approach can help alleviate symptoms and improve survival.

The first left-ventricular assist device, or LVAD, became available in the mid-1980s. Since then, the technology has improved, becoming more compact and with fewer moving parts -- including through clinical research at New York-Presbyterian/Columbia leading to the FDA approval of Thoratec's HeartMate® and HeartMate® II. The DuraHeart is considered a third-generation device, with unique features -- including a paddlewheel-like component called an impeller that is suspended by an electromagnet -- eliminating any bearings or contact points and allowing it to work at slower speeds, potentially reducing device wear and risk for blood cell breakage.

Source: New York- Presbyterian Hospital ([news](#) : [web](#))

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