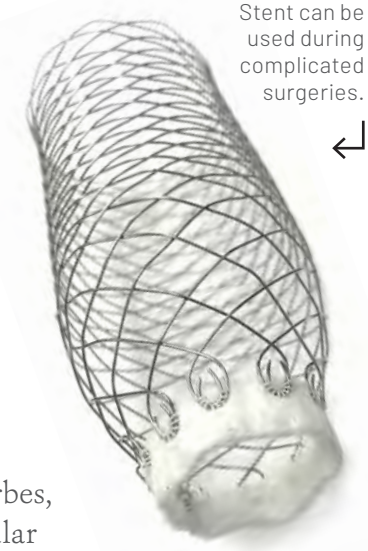
LIFE-SAVING DEVICES

They restore hope and confidence, and they give people a second chance at life, but these devices aren't cheap.

BY DIANE PETERS

"Saving lives does not wait for coverage," says Dr. Thomas Forbes, R. Fraser Elliott Chair in Vascular Surgery, Division Head of Vascular Surgery, Peter Munk Cardiac Centre, UHN Sprott Department of Surgery. This mantra is critical, especially when it comes to the many mechanical devices doctors implant on an almost regular basis. Since the 1990s, the Centre has been outfitting patients with devices that drastically improve their quality of life, but if it weren't for philanthropy, surgeons wouldn't always have access to these costly pieces of equipment.

While the government eventually covers some of the cost, it's because of donors that the Centre's team can perform such complex operations. "We don't turn anybody down for surgery," says Dr. Forbes. This sense of responsibility has become synonymous with the Centre's global identity, and it's also why it's routinely chosen to provide cutting-edge equipment for patients who need it most.



The Ascyrus Medical Dissection Stent can be used during complicated surgeries.

"We would not be able to use the needed devices without philanthropic support."

Dr. Maral Ouzounian

"We're using the best equipment, the best techniques and the best people."

Dr. Thomas Forbes

Repairing ruptures

ASCYRUS MEDICAL DISSECTION STENT (AMDS)
COST: $20,000

Last summer, Emily Keizer, 57, was about to set off into the bush to find chanterelle mushrooms with her husband. As she sat down to put on her boots, a searing pain tore through her chest and up through her shoulder blades. "It was horrible," she says. The professional artist was rushed to the hospital in nearby Timmins, Ont.

A CT scan revealed that an aneurysm in the chest section of her aorta had ruptured and was limiting blood supply to the right side of her brain. Without immediate surgery she would have a severe stroke or die.

Keizer was helicoptered to the Peter Munk Cardiac Centre, where a team led Dr. Maral Ouzounian, cardiac and aortic surgeon, Peter Munk Cardiac Centre, Division of Cardiovascular Surgery, UHN Sprott Department of Surgery, was ready even before she arrived. "When you tear the main blood vessel in your body, every branch that comes off it can be affected by the tear," she says. Surgeons have always struggled to repair this part of the aorta, which supplies blood to the rest of the body. It wasn't going to be an easy operation.

Fortunately, Dr. Ouzounian knew of a device that could make a difference: the Ascyrus Medical Dissection Stent, a dissection-specific hybrid prosthesis. The device, which is approved by Health Canada for use at the Centre but is not yet funded by Ontario's Ministry of Health, resembles a tube of chicken wire made of fabric and metal that gets implanted into the branched-off section of the aorta to help it heal and keep blood flowing through the proper channels.

It's so new that only a few sites in Canada have access to this specialized device. It was this access that enabled Dr. Ouzounian to successfully use this device to repair Keizer's aorta after an intensive five-hour surgery. Had it not been for philanthropy, and the expertise of the Centre's team, they wouldn't have been able to use the stent that allowed Keizer to walk out of the surgery alive. After a week, she went home, where she picked up where she left off: hunting for mushrooms. "I can't believe someone gave me the chance to be here," she says.

DEVICE PHOTOS BY: EDWARDS LIFESCIENCES LLC (SAPIEN 3 VALVE), ABBOTT MEDICAL DEVICES (HEARTMATE 3 LVAD), ASCYRUS MEDICAL (ASCYRUS MEDICAL DISSECTION STENT)

Keeping hearts beating

LEFT VENTRICULAR ASSIST DEVICE (LVAD)
COST: $130,000

When Lina Amaral was just 44, she began to feel sick. "I couldn't breathe," she says. "When I bent down, I felt like I would explode." She was diagnosed with congestive heart failure – doctors suspected it was caused by a virus that had attacked her heart.

By age 51, she was being treated at the Peter Munk Cardiac Centre with end-stage heart failure. "They didn't think I was going to make it," says Amaral. A transplant seemed to be the only way to help her, but she needed a perfectly compatible heart since her antibodies were so high. Unfortunately no such hearts were available. In 2009, Dr. Vivek Rao, Division Head of Cardiovascular Surgery, offered Amaral something else: a left ventricular assist device (LVAD).

This "mechanical heart" – a metal, battery-operated pump that gets implanted directly into the heart – has traditionally been used as a temporary bridge to a transplant, keeping a patient alive as they wait to receive a new heart. Now, they're often used as a permanent support for those who have been deemed ineligible for a transplant. People with LVADs find it life-changing. "They have the energy to resume their daily activities and even do things that were once out of the question," says Dr. Rao.

It was only in 2017, 16 years after the Peter Munk Cardiac Centre opened its mechanical heart program, that the government started funding the device for patients not eligible for transplant. It now funds 45 implants a year at the Centre. Before then, it was solely philanthropy that funded the first 200 devices, including Amaral's.

While Amaral is no longer a candidate for a transplant, her LVAD will keep her alive for many more years. "I got a second chance at life," says Amaral, who is the Centre's longest-surviving patient with an LVAD.

Last fall, she became a grandmother of two and is grateful she can see her grandchildren grow. "It's a great sense of satisfaction to see Lina," says Dr. Rao. "She was so sick before and I know how this device has changed her life for the better."

TAVIs save lives by replacing diseased valves.

The LVAD is a metal pump that helps the heart do its job.

"I thank God I'm alive every day."
Lina Amaral

Transcatheter aortic valve implant (TAVI)

COST: $25,000

When the valve that connects the heart to the aorta becomes calcified, the opening narrows and prevents blood from flowing properly to the body. "That's a problem," says Dr. Ouzounian. "Once the narrowing is severe and patients develop trouble breathing, 50 per cent die within two years." Fortunately, patients can undergo a TAVI procedure to replace the diseased valve without open-heart surgery. This device gets implanted via a catheter threaded through a blood vessel. The complex and life-saving procedure is only partially covered by the province.

Custom-made branched and fenstrated endografts

COST: $35,000

An aneurysm is fatal if it ruptures. Those who have an aneurysm in the aorta in their chest must get it repaired so it doesn't burst, but blood also needs to continue flowing through the aorta's branches to the legs, kidneys, brain and more. To repair these complex aneurysms in a minimally invasive way, doctors use an endovascular graft, which fits inside the aorta and looks like a "fancy toilet paper roll with branches," says Dr. Forbes. Since this graft has to fit perfectly, the manufacturer makes a custom device for each surgery. That requires careful imaging of the patient and extensive planning between the surgeon and the manufacturer.