



Toronto General Hospital
University Health Network

The LVAD: When the Heart Needs a Hand

Toronto General Hospital, University Health Network, is home to both the largest heart failure and mechanical heart pump or heart assist device program in Canada.

TGH currently implants about 18 patients per year and has the largest selection of mechanical heart devices in Canada, enabling the program to tailor each device to unique patient needs, e.g. implanting smaller patients and ensuring a better quality of life.

TGH had had considerable experience with cardiac assist devices. Dr. Vivek Rao, Cardiovascular Surgeon and Head of the Ventricular Assist or Heart Pump Program at TGH and Associate Professor of Surgery at University of Toronto, implanted the first HeartMate device in Canada in 2001. Since then, the team has implanted almost 30 heart failure patients at risk of imminent death with a longterm Left Ventricular Assist Device (LVAD). In addition, another 30 short-term non-portable devices were implanted to provide emergency support to patients at imminent risk of death. Patients have been supported for an average of 132 days, and more than half were able to go home and resume most activities of daily living. Twenty percent of those who went home were supported for more than six months.

Aaron Knox, 30, is Canada's longest recipient of a portable heart pump. He was implanted at TGH and supported for 18 months (567 days from Aug. 11, 2003 until February 28, 2005) on the device until a suitable donor heart became available.

Dr. Rao estimates that about 1,700 patients could be helped by a portable heart pump. About 500,000 patients in Canada have heart failure, and of those, 2,000 could potentially benefit from a heart transplant, but due to limited organs, only about 200 actually receive one.

What is an LVAD?

It is a surgically implanted mechanical device that helps the heart pump blood throughout the body.

Who needs and gets an LVAD?

Patients who have heart failure, a condition whereby the heart is unable to pump adequately to meet the needs of the body, may be eligible for an LVAD.

The LVAD is aimed at improving the patient's quality of life while the patient waits for a transplant and preventing deaths on the waiting list; it is considered a "bridge to transplant."

The recipient of the LVAD and a 24-hour companion must pass a training course on the use and care of the device, with particular attention to emergency interventions before having the LVAD implanted.

How does the LVAD work?

The LVAD either takes over or assists the pumping role of the left ventricle, which is the heart's main pumping chamber; this ventricle supplies oxygenated blood to the entire body, and accounts for 80 per cent of all heart failure. Once the device is attached, blood flows from the left ventricle through a tube into the device, the device then pumps it through another tube into the aorta and out to the brain and the body, like a healthy heart would. In this way, the weakened ventricle is bypassed.

