

Collapsible valve offers hope to those too weak for open heart surgery.

Right now, inside your chest, inside your heart, your aortic valve is opening and closing. Controlling the flow of blood to your body. Over an 80 year life span, the valve will open about once every second or 2.5 billion times.

technology overview

The transcatheter heart valve is a tissue valve replacement that can be compressed down to the diameter of a pencil. It can be placed inside a beating heart using a catheter threaded through the patient's circulatory system or through a small incision between the ribs. Once inside the heart, the valve can then be opened into its natural position by the inflation of a balloon and deployed within the patient's diseased aortic valve.

Advanced age or heart disease can cause the aortic valve to thicken, narrowing the opening through which blood flows. This condition, called aortic stenosis, can leave patients weak, short of breath and exhausted after even minimal exertion. Recommended treatment for advanced cases is surgical valve replacement.

Normally, this type of surgery requires opening the chest, stopping the heart, removing the old valve and replacing it with a new, prosthetic one. While many patients do well with this type of surgery, others may not be able to tolerate such a major, invasive procedure. Patients who are weakened by age or other complicating illnesses may be poor candidates for conventional "open heart" surgery. Doctors are often forced to tell these patients that, regrettably, there is "nothing that can be done."

"There is a need for an alternative (procedure) that might lower morbidity and mortality in these high-risk patients," says Dr. John Webb of St. Paul's Hospital in Vancouver and a leader in the development of this procedure.

Fortunately, a new technology is currently undergoing clinical trials that may offer hope to those who would otherwise have limited or no treatment options. Half of these untreated patients with severe symptoms will die within two years.

A new procedure is now being tested that uses a high-tech replacement heart valve that can be compressed and manipulated into place using a catheter inserted into the patient's body through a major blood vessel. Once the catheter is in place, the valve is opened into its natural position by the inflation of a balloon and positioned within the patient's diseased aortic valve. It then takes over the work of the diseased valve.

Clinical trials suggest this new device may offer hope for patients who are too high-risk for conventional heart valve replacement surgery. The procedure has the potential to shorten post-operative recovery time because the procedure does not require the physician to open the chest or put the patient on a heart-lung machine.

"We know the transcatheter valves are lasting several years and for patients who are very ill, this seems to be a good solution for them," reports Dr. Webb.

Clinical studies are currently underway at leading centers of excellence in Canada, the U.S. and Europe. The device is already available commercially to patients in Europe.

