

Increased implantation of artificial heart valves

The Vancouver plant of Mitral Medical International Inc. of Denver, Colorado, a manufacturer of implantable cardiovascular devices, has developed a number of artificial products that are increasingly being tested and applied throughout the world.

Some of the plant's main developments include an artificial mitral valve, an artificial artery and an artificial cardiac membrane patch, based on polymer chemistry technology.

The new artificial heart valve, which was the first product developed in the Vancouver laboratories, has recently received the approval of the United States Food and Drug Administration (FDA) to be tested on humans in the US. Over the next six months, the

valve will be implanted in 100 humans by surgeons in up to eight hospitals.

Unique heart valve

Mitral Medical's valve differs from other implantable mitral valves in composition and construction. It is the first to use bovine pericardial tissue (taken from cattle) and to be clinically tested in humans. The construction of its frame also distinguishes the device from earlier porcine or silicon rubber valves.

According to Keith Gilding, president and chief executive officer of Mitral Medical, the new valve "is much easier to sew on the frame and is less bulky than porcine tissue". He added that "it essentially maximizes the

working orifice of the valve and its hemodynamics are much improved".

Hemodynamics is the physics of blood flow. Clinical tests on 1 600 patients in Europe, Canada and Japan over the past two years have indicated that the bovine valve requires the heart to expend less energy than other valves to achieve the same blood flow.

Improved polymer formula

Mitral Medical's proprietary polyurethane formulas, marketed under the trade name Mitrathane, could also position the company for a role in the development and implantation of artificial hearts. Two such devices have been implanted to date in the United States.

"We have developed an improved polymer formula which is made to the rigid specifications of an artificial heart, and is the second focus of our clinical testing and research and development. It is based on polyurethane and polyetherurethane urea," Mr. Gilding said. The properties and molecular structure of the polymer differ from Dacron (a polyester-based chemical) and silicon rubber, other substances used in cardiology. Because the molecular construction of Mitrathane is a step-by-step process, Mr. Gilding said, there is greater quality control.

Mitral Medical is using this polymer to make artificial arteries and patches for the pericardial membrane — the thin sac — that surrounds the heart. These implants are being tested outside the United States but the company expects FDA authorizations for testing in the United States early this year.

The artificial artery has been implanted recently in three critically ill patients in Europe by heart surgeons who had no other way of performing coronary bypasses. Mr. Gilding said they expect to be able to develop an artificial skin with polymer.

Formed in 1979, Mitral Medical takes its name from the mitral valve of the heart, the thin membrane between the left atrium (upper chamber) and the left ventricle (lower chamber) of the heart. The valve prevents blood from flowing back into the atrium. The most common cardiac defects that require mitral valve implants are congenital defects and mitral stenosis (narrowing of the valve) in adults.

Mr. Gilding, who is a polymer chemist and head of the company's research and development efforts, began as a researcher in 1960 at the National Research Council in Halifax, Nova Scotia. Before being asked to head Mitral Medical's research and development team in 1979, he worked for Johnson and Johnson of New Brunswick, New Jersey, on the development of a polymer chemical, called Biomer, that is used on the Jarvik-7 artificial heart.

New uniforms for Canada's armed forces

While retaining their unified structure, Canada's armed forces will be issued with three distinctive uniforms — green, dark blue and light blue — for the land, sea and air elements. Lighter weight summer versions will be in tan, white and light blue.

The cuts of the land and air uniforms will remain the same as the present uniform but with the addition of epaulettes for the former. The sea element will wear double breasted jackets.

Rank symbols will remain the same to signify the unified force.

All regular and reserve personnel will receive an initial free uniform. Issuing will begin by summer 1985 and it is expected that all members of the regular forces and primary reserve will be outfitted in winter uniforms by autumn 1987 and in summer ones by spring 1988. Uniforms for the supplementary reserve and the cadets will be issued at a later date.



Four of the new armed forces uniforms are (from left to right): Army, summer; Army, female; Air Force; and Navy, winter.

Canadian Forces photo