Metal Implants Help Hip Victims Walk Better

Metal implants that must respond to the demands of the human body are being developed with new and improved materials for greater effectiveness

By Faye Marley

➤ THE HIP of an elderly woman will break under a load of 1,200 pounds, whereas a person under 65 can bear a weight of between one ton and a ton and a half, the American College of Surgeons was told in San Francisco.

Engineers in the American Society for Testing Materials (ASTM) have "stumbled" onto improved metal implants that are expected to help persons with broken hips walk better, Horace Grover of the ASTM told SCIENCE SERVICE.

"Our work began when an engineer 'stumbled' and broke his hip," Mr. Grover said. "The implant failed and we began testing better materials."

The best material so far used for implant has been refined stainless steel, but cobalt alloys have also been tested and engineers are exploring titanium. Zirconium fell by the wayside because it failed during testing.

"Abuse" of metal implants has been due not only to patients who disobey their surgeons and walk too heavily, but to surgeons and nurses as well as engineers who use the wrong materials.

The gathering of surgeons also heard the term "artificial heart" described as one which misleads the public.

"It will be years before a real artificial heart can be placed successfully in the chest cage of a human being," Dr. Adrian Kantrowitz of Maimonides Hospital, Brooklyn, N.Y., told a news conference. "The known problems have so far proved insurmountable and the unknown problems have not yet been faced. Dr. Michael DeBakey's artificial heart is not intended as a permanent organ but as temporary assistance to a patient in need of help."

Dr. Kantrowitz has been actively engaged in research with partial heart replacements for the past 12 years. Along with his brother, Dr. Arthur Kantrowitz of the Avco-Everett Research Laboratory, he has developed the "Kantrowitz Ventricle." This internal prosthesis is implanted in the patient's heart so as to bypass the aortic arch and perform the function of the left ventricle, the chamber of the heart which does approximately 85% of its work.

The support device is externally operated through the use of a pneumatic pump, tied to an electronic amplifier and power supply.

Also promising has been the work of Dr. Tetsuzo Akutsu, who works with Dr. Kantrowitz in Brooklyn. His artificial hearts have worked in the normal heart space of 21 dogs, but the longest survival of any of the animals was 27 hours.

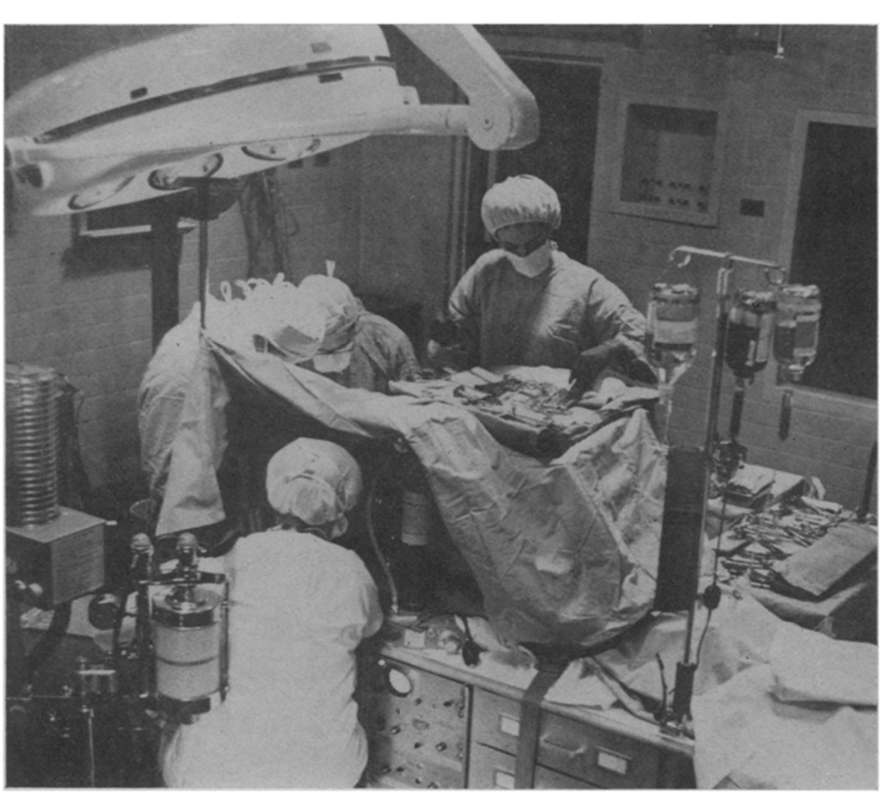
"It is not simply a matter of pumping blood," said Dr. Kantrowitz, "the true artificial heart will have to respond to the needs of the human body. Signals to slow down or increase action as in exercise will have to be taken in consideration."

The power sources for artificial hearts must at present be outside the body, the Brooklyn surgeon said. Dr. Kantrowitz opposes use of money to send a man to the moon when the amount saved could help to put an artificial heart into a human being.

Adair Rogers, an engineer in the University of Pennsylvania School of Medicine, reported on an engineering heart model that he has been testing for fluid volume and atrial pressure.

"It will be 50 to 75 years," he said, "before he will have a model that can be placed in the human heart space. We have achieved input pressures but we cannot make our hydraulic system perform in response to all the body signals that come from flow rates, chemicals in the blood and from nervous origin.

"For example, when the blood pressure goes up at the sight of a beautiful blond passing by, the artificial heart might fail completely."



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MAX—Max is the nickname of a new mobile life support system that hospital personnel may be using to give emergency treatment to patients suffering from such problems as cardiac arrest. Developed by Dr. Joel Nobel when he was a resident at Pennsylvania Hospital, Philadelphia, it was built by Corbin-Farnsworth Inc., Palo Alto, Calif., and was displayed at the American College of Surgeons meeting.