

MEDICINE

New Heart Pacemaker

A cardiac pacemaker implanted under the skin has an outside battery that can be recharged without surgery and turned off when the patient's heart begins to work again.

► AN IMPLANTED HEART pacemaker that has the advantage of an outside battery will be ready for use on humans as soon as clinical tests are completed.

This miniature broadcasting station is tuned to an insulated pick-up coil, or "antenna," placed underneath the skin in the chest area.

The "radio frequency stimulation" device can be adapted for use for paraplegics whose bladders have become infected by numerous continued catheterizations and for persons with chronic respiratory problems—even for some iron lung patients.

Lawrence Eisenberg, research associate in electronics, Rockefeller Institute, New York, told SCIENCE SERVICE that the advantage of the outside battery in the new cardiac pacemaker is that it can be changed without surgical operation on the patient when the battery wears out, which is about every six months.

The cardiac pacemaker of the implanted type now in use is a battery-operated transistor device implanted in the abdomen with wires running to the heart to correct an irregular pacing of beats. The device is preset at a precise amplitude level, and the heart muscle, or myocardium, is pulsed 60

times a minute to simulate the typical heart beat.

The new pacemaker, now being manufactured by Airborne Instrument Laboratories, a division of Cutler Hammer Corporation, Deer Park, Long Island, N.Y., generates at two megacycles a second. It generates radio frequency pulses at one-thousandth of a second.

Another advantage of the outside battery is that it can be turned off if the patient's own pacemaker system begins to work again, Dr. Eisenberg said.

The implanted coil is circular, about one and three-eighths inches in diameter and one-half inch thick.

Mr. Eisenberg explained that the implanted unit contains a coil, a capacitor and a diode, with a pair of electrodes that run to the heart muscle.

Detailed explanation of the possibilities of radio frequency stimulation as a research and clinical tool was given in Science, 147: 578, 1965, by Mr. Eisenberg, Dr. Alexander Mauro, also of Rockefeller Institute, Dr. William W. L. Glenn and Dr. John H. Hageman, both of the Yale School of Medicine, New Haven, Conn.

• Science News Letter, 87:114 February 20, 1965

MEDICINE

Cancer, Clotting Linked

► PREVENTION OF CANCER spread, or metastasis, by interference with blood clotting is an exciting possibility, researchers have found.

Much evidence from animal experiments has shown that blood-borne cancer cells spread when they are trapped by the sticky lining of blood vessels. When anticoagulants such as heparin or dicumarol are given, the frequency of metastasis is reduced without affecting cell growth.

Nutrition Reviews, 23:41, 1965, lists recent studies with anticoagulated humans, supporting the suggestion of a direct relationship between the blood clotting system and the formation of "metastatic lesions" in cancer.

In Lancet, for example, a study was reported last year of 399 men and 141 women who had received one of the coumarin anticoagulant drugs from three to 111 months. The researchers found only one cancer death among these 540 patients, who were followed for 1,569 treatment years. Surprisingly, they said, only two organs were found involved with metastases in patients whose deaths were not directly related to cancer.

A recent study in the United States, reported in the Journal of the National Cancer Institute by Drs. Eugene E. Clifton and Domenico Agostino of Memorial Sloan-Kettering Cancer Center, New York, showed lack of cancer metastases in a number of animals that had been injected with cancer cells.

The possibility of surgery freeing cancer cells into the human blood circulation has long been under study. The Sloan-Kettering researchers point out that "if this could be prevented by the use of a fibrinolytic agent (an enzyme that causes the solution of fibrin clots) or by anticoagulants," then the removal of a tumor that happened to spill cells at the time of operation would be more likely to result in a cure.

Control of excessive hemorrhage is a factor in the successful use of anticoagulants during surgery, these researchers emphasize. They say that there are "variations in the clotting mechanism at the time of surgery and in the immediate postoperative period." In a few cases dangerous hemorrhage occurs because of the lack of blood coagulation.

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Excessive Drink Causes Heart Muscle Disease

► TOO MUCH DRINKING can lead to a kind of heart disease not due to any other disorder, two London Hospital scientists report.

Non-coronary myocardial, or heart muscle, disease causing faulty rhythm and heart failure was found in 50 patients, 49 men and one woman, who drank excessively.

One-third of them drank beer only, but the average consumption was 15 pints a day. One-fourth drank hard liquor at the rate of one bottle or more a day. The rest of them drank both beer and hard liquor in large quantities.

Unlike the progress of heart failure in coronary disease, high blood pressure and valvular disease, there were phases of spontaneous remission in some patients.

One man aged 46 who had started regular beer-drinking at the age of 15, drank 36 pints during the 24 hours before he was admitted to the hospital. He was in severe congestive heart failure with massive edema, or swelling.

Digitalis and diuretics produced little response during the first four days, but on the fifth day 100 milligrams of aneurin, also called thiamine and vitamin B-1, brought about the necessary diuresis, and after the doctors continued the aneurin in the same dosage for a week, he recovered. After a long period of not drinking he was free of symptoms.

Response to aneurin is associated with beriberi, a form of polyneuritis due to vitamin B deficiency, which occurs chiefly in eastern and southern Asia.

The effect of this occidental beriberi on the heart was reported in 1929, and after that time the same condition was recognized in the West as being mainly the result of alcoholism.

Drs. Wallace Brigden and John Robinson reported their further findings in the British Medical Journal, Nov. 21, 1964. They said cardiac beriberi occurred only in five of their patients, two of whom had had a previous stomach operation that was thought to provide an additional adverse nutritional factor.

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DIETETICS

Food Industry Advised To Sell Leaner Meats

► THE FOOD INDUSTRY should promote general use of leaner meats, a report on cardiovascular diseases stated. Also needed are low-fat dairy products, frozen desserts and baked goods.

The second National Conference on Cardiovascular Diseases included diet as a possible cause of atherosclerosis, the form of hardening of the arteries responsible for most heart attacks and strokes.

The conference was sponsored by the American Heart Association, the National Heart Institute and the heart disease control program of the U. S. Public Health Service.

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