MEDICINE

Recent Heart Research

Second World Congress of Cardiology told about latest advances in the battle against heart disease, the number one killer in the United States. Interlingua used for abstracts.

➤ A BLOOD test for heart damage that may save patients weeks and months of unnecessary invalidism was announced at the Second World Congress of Cardiology meeting in Washington.

The test was developed by Drs. John S. LaDue, Felix Wroblewski and Arthur Karnen at the Sloan-Kettering Institute, research unit of Memorial Center for Cancer and Allied Diseases. New York. It is a by-product of cancer investigations.

The test will be used to determine whether the patient has heart damage due to a heart attack of the kind doctors call coronary thrombosis, meaning a block in one of the blood vessels nourishing the heart muscle.

Usual diagnostic methods for determining this are sometimes inconclusive and, in such borderline cases, patients now may be put to bed for weeks or until the doctor is sure their hearts are not damaged. The new test will avoid this.

It is made on a sample of blood and can be performed in the doctor's office or the patient's home. The test depends on the amount of an enzyme, glutamic oxaloacetic transaminase, found in the blood. Normally, this enzyme is found in highest concentration in heart muscle. When the heart muscle is damaged, it is liberated into the blood stream.

Tests on 50 patients with heart damage showed two to 25 times the normal amount of the enzyme in the blood within 12 to 24 hours after the heart attack. Every patient tested who was known to have heart damage (myocardial infarction) showed above normal amounts of the enzyme in his blood.

Patients with arteriosclerotic and other types of chronic heart disease, however, all had normal amounts of the enzyme in their blood.

Pressure Test Needed

Most needed now for treating high blood pressure is a test for telling which basic mechanism is producing the high pressure in each patient, Dr. Irvine H. Page of the Cleveland Clinic, Cleveland, Ohio, said at the Congress.

Doctors now have a score of drugs that reduce blood pressure, but they do this by acting on different mechanisms in the body. The big problem is to find the right drug for each patient.

For example, reserpine and other drugs from the snakelike root of the Indian plant, *Rauwolfia,* act on the brain and central nervous system. The quieting or tranquilizing effect of these compounds seems to be what some patients need to reduce their high blood pressures.

Apresoline, or hydralazine, acts on another part of the nervous system and also inactivates a pressure-raising substance in the blood.

Acting to block sympathetic nervous system impulses at the ganglia, well back of the blood vessels, are still other chemicals: hexamethonium and a newer one, pentapyrrolidinium.

Many doctors at the Congress are enthusiastic about pentapyrrolidinium, known also as M. and B. 2050 and Ansolysen. One of its advantages is that it can be taken by mouth and another is that its effect lasts longer.

All the blood-pressure-reducing drugs seem to have some unpleasant side effects. These range from drowsiness to impotence and even production of a disease like arthritis. Doctors prescribing them, consequently, must find not only the right drug for the particular patient, but also the delicate balance in size of dose between that needed to reduce pressure and that which can cause unpleasant or serious side effects.

Interlingua Used

First major use of the international language, Interlingua, in an international congress took place at the Second World Congress of Cardiology.

Each abstract of the many papers being presented during the meeting was printed in the easily-read "standard average European" Interlingua as well as in the language of the speaker.

"Interlingua has been developed primarily upon the basic words of the romance languages," Dr. L. Whittington Gorham, of the Congress, explained. "It is hoped that our efforts to facilitate understanding will make the barrier of languages less formidable than it otherwise would be."

Potent Heart Poison

Discovery of a powerful heart poison in a chemical from the streptococcus germ was reported by Drs. Aaron Kellner and Theodore Robertson of New York.

This poison may be the cause of the heart damage following rheumatic fever attacks, the New York doctors believe.

Doctors have known since 1934 that an attack of rheumatic fever almost always was

MILLIMETER WAVES—Scientists at Stanford University, Calif., have now filled a gap in the electromagnetic spectrum by generating millimeter waves about six-thousandths of an inch long. Here Dr. Hans Motz of the Microwave Laboratory adjusts the echelette spectrometer, a key part of the millimeter wave generator he invented. Other components are an accelerator and an "undulator."

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preceded by certain types of streptococcus infection. The exact relation between the strep. infection and rheumatic fever and rheumatic heart disease, however, was not known.

Now it appears that the missing link has been found in this strep. germ heart poison. The heart poison is a protein-digesting enzyme. It was isolated in crystalline form in 1950 by Dr. S. D. Elliott of the Rockefeller Institute, New York. He called it streptococcal proteinase.

Drs. Kellner and Robertson injected this strep. germ enzyme into the veins of rabbits, mice, guinea pigs and cats. It caused "striking" damage to the muscles and valves of the animals' hearts, with an inflammatory reaction. With only a few exceptions, the enzyme's destructive action was confined to the heart, other parts of the body being unharmed.

When the enzyme was added to the fluid in which an isolated rat heart was being kept alive and beating, contractions soon decreased in strength and frequency, and heart failure occurred within a few minutes.

Rheumatic fever attacks 30,000 Americans yearly, most of them between the ages of five and 15. It is responsible for an estimated 1,000,000 cases of rheumatic heart disease in the United States.

Alcohol and Tobacco

Alcohol and tobacco were reported as probable causes of heart disease.

Hardening of the heart's own blood vessels was 20% to 50% higher in men who started to use tobacco and alcohol in their 20's and continued to use them throughout life than in men who did not use either, Dr. Noboru Kimura of Kyushu University, Fukuoka, Japan, found in autopsy studies of patients dying at the university hospital.

Dr. Kimura said he is not sure whether the difference depends only on the effects of alcohol and tobacco.

"Usually," he said, "the men who have these habits lead a more irregular life than do the abstainers."

Heart Beat Mechanism

Discovery of the human heart's "equipment" for a lifetime of beating ceaselessly night and day without prolonged rest was announced by Dr. Bruno Kisch of New York.

This equipment consists of extremely small fibers within the heart muscle filaments. They are called sarcosomes, and are found in great masses in heart muscle, but almost not at all in other muscles of the body.

The sarcosomes, Dr. Kisch reported, carry enzymes that promote chemical reactions in the body. They keep the heart muscle from getting tired, under normal circumstances, by providing the heart with great quantities of enzymes for the chemical processes by which the heart tissue is nourished and restored.

Dr. Kisch discovered these bodies by electron microscope studies of the heart. With this powerful magnifying instrument, heart muscle filaments were seen enlarged 50,000 to 80,000 times, and the secret of the heart's tirelessness was found in the sarcosomes.

Another very small, previously unknown structure was found inside heart muscle fibers magnified by the electron microscope. This structure is so small that 5,000,000 of them laid side by side would scarcely measure half an inch.

The function of this tiny structure is not yet known.

Graft for Heart

An operation that helps heart patients was reported by Dr. Arthur Vineberg of McGill University, Montreal.

The artery grafting operation was designed for patients who have a block in a blood vessel nourishing the heart muscle. In many of these, other blood vessels beyond the block can function fairly efficiently if blood can be got past the block to them, Dr. Vineberg said.

Since the condition is a mechanical one, he believes only mechanical methods will overcome it.

To do this, he moves an artery from inside the chest wall into a tunnel cut into the heart muscle. This transplanted artery is tied at one end, but has a slit cut in its side. Blood flows through this slit into the heart muscle.

More important, the transplanted artery develops branches that work their way through the heart muscle, carrying blood with them, and often meet and join other blood vessels to complete a new network of blood-carrying arteries.

Dramatic proof that the operation works this way in a human heart came from a patient who died 82 hours after the operation because of a bronchial spasm due to penicillin allergy. India ink injected into the transplanted artery reached all parts of the heart's left ventricle including individual muscle fibers.

If the ink did this after death, blood traveling down the artery in living patients must do the same.

The operation has so far been performed on 36 patients, but the last six operations are too recent to know about results.

In 22, there were no deaths and three-fourths of these totally disabled patients have returned to work. One man works as much as 16 hours a day in a machine shop. There were five deaths in a group of eight even sicker patients. The three survivors show improvement.

The operation is not suitable for all patients. Dr. Vineberg thinks it should not be done on patients with such severe heart disease that there is almost no healthy heart muscle left. These cannot be helped.

Another group consists of patients who have had only one heart attack and whose hearts are not severely damaged. They can return to work without the operation.

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TECHNOLOGY

21-Inch Color TV Pictures Received by "Simple" Set

➤ A 21-INCH color television tube built into a "simplified" color receiver has been demonstrated to show that big-picture screens can be made in color as well as in black and white.

The demonstration, in which color images were flashed upon the screen, was conducted at the Radio Corporation of America's David Sarnoff Research Center, Princeton, N. J.

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