ORIG

TODAY

A nuclear picture of the h

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A MAN LIES on a hospital bed, a massive six-sided white camera positioned over his chest. On the screen of a computer next to the bed, a motion picture begins to appear – the image of a beating heart.

Very soon, the picture becomes clearer. In five minutes, even an untrained eye can clearly see the right side of the heart bulge, as the blood rushes into it, and contract as it squirts the blood out toward the man's lungs.

Called a radionuclide ventriculogram – a nuclear picture of the heart – the procedure uses small amounts of radioactive materials injected into the bloodstream, making it possible for doctors to get an exact picture of a beating heart without ever having to cut into the patient's skin, according to Dr. Scott Ratner of St. Luke's Roosevelt Hospital Center in Manhattan.

The nuclear cardiogram is taken by a special camera that detects radiation from the chemical that is injected into the patient's blood. Each time the heart beats, Ratner says, the camera takes 16 pictures. These pictures are then electronically added to the previous 16 pictures from the last heart beat. As this process is repeated several hundred times, a clear image slowly develops.

The 16 frames are then played back by the computer in an endless loop, creating in effect a movie of the beating heart. The doctor can watch the movie by the patient's bedside or send it elsewhere for analysis.

Although nuclear cardiology is a technique that is almost 20 years-old, recent drops in the cost of computer equipment coupled with increased quality of computer imaging equipment is making procedures like this one easier to perform and more useful as a diagnostic technique. Consequently, the number of nuclear cardiographs being performed on a daily basis is rapidly increasing, said Ratner, who is associate director of the hospital's intensive care unit.

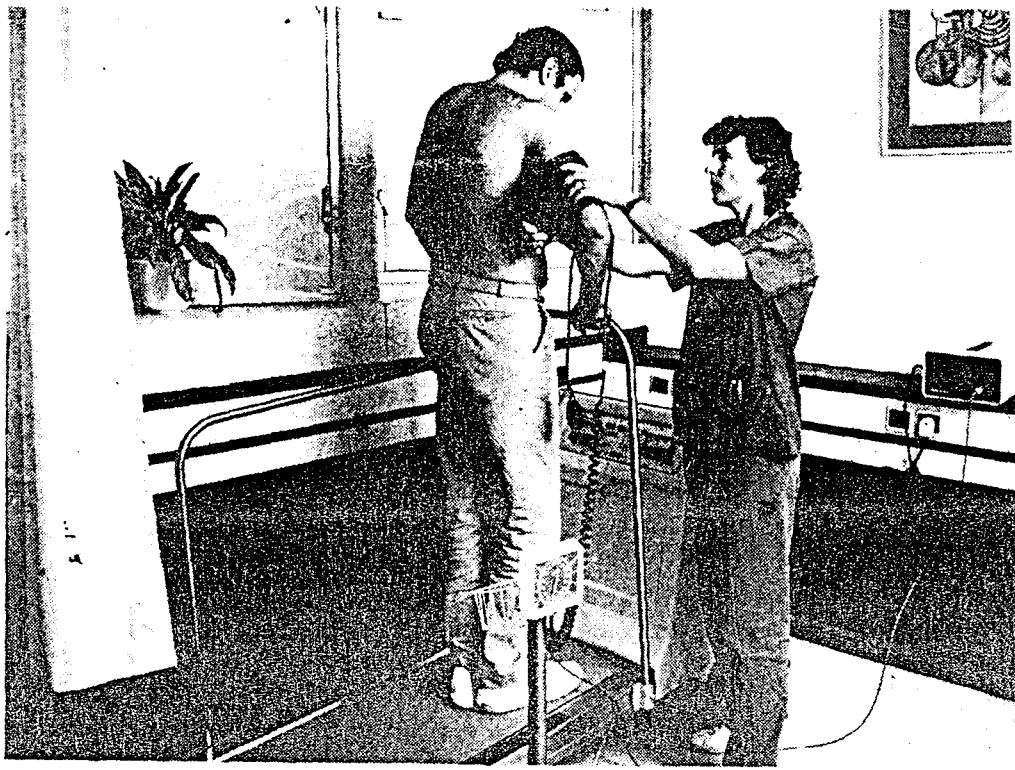
The camera and bedside computer are made by Haifa-based Elscint, which makes medical imaging equipment. St. Luke's uses the firm's Apex 209M which costs about $150,000, according to Ron Alexandri, a company spokesman.

The radiation comes from a substance called Technetium-99m, a radioactive isotope that is produced in the basement of the hospital, Ratner explains. The amount of radiation used in the process is very small. Technetium-99m has a half-life of six hours, which means that every six hours only half remains. The total dose that the patient receives is 20 millicuries.

"That's more than a chest X-ray," notes Ratner, but still well within federal guidelines. "This is not considered to be any hazard."

The way that the heart performs – both at rest and under the stress of exercise – depends in part on the blood supply it receives. Not the blood that the heart pumps, he says, but rather the blood in the arteries that supply the heart with oxygen and nutrients – the coronary arteries. If an artery is partially blocked, the parts of the heart muscle that it feeds will not be able to function properly during times of stress.

The blockage can be treated with drugs with a coronary bypass or with a balloon angioplasty. But before it can be treated, the doctor must know the number of blockages, where they are, and if the affected part of the heart is still alive or only a dead scar. That's where Dr. Ratner says nuclear cardiology comes in: It gives the doctor a clear picture of the patient's heart without being invasive.



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AT THE Sloan-Kettering Memorial Institute for Cancer Research, doctors have another use for nuclear cardiology: detecting the damage done to the heart by drugs used in cancer chemotherapy. The technique is also used to examine the hearts of patients who are to undergo major cancer surgery who are elderly or who have previously had heart disease.

Many chemotherapy patients receive adridmycin, a drug that is useful against many kinds of cancer, says Dr. Samuel D.J. Yeh of the Department of Nuclear Medicine at the institute. "Unfortunately, it may cause damage to the heart muscle," in certain doses,

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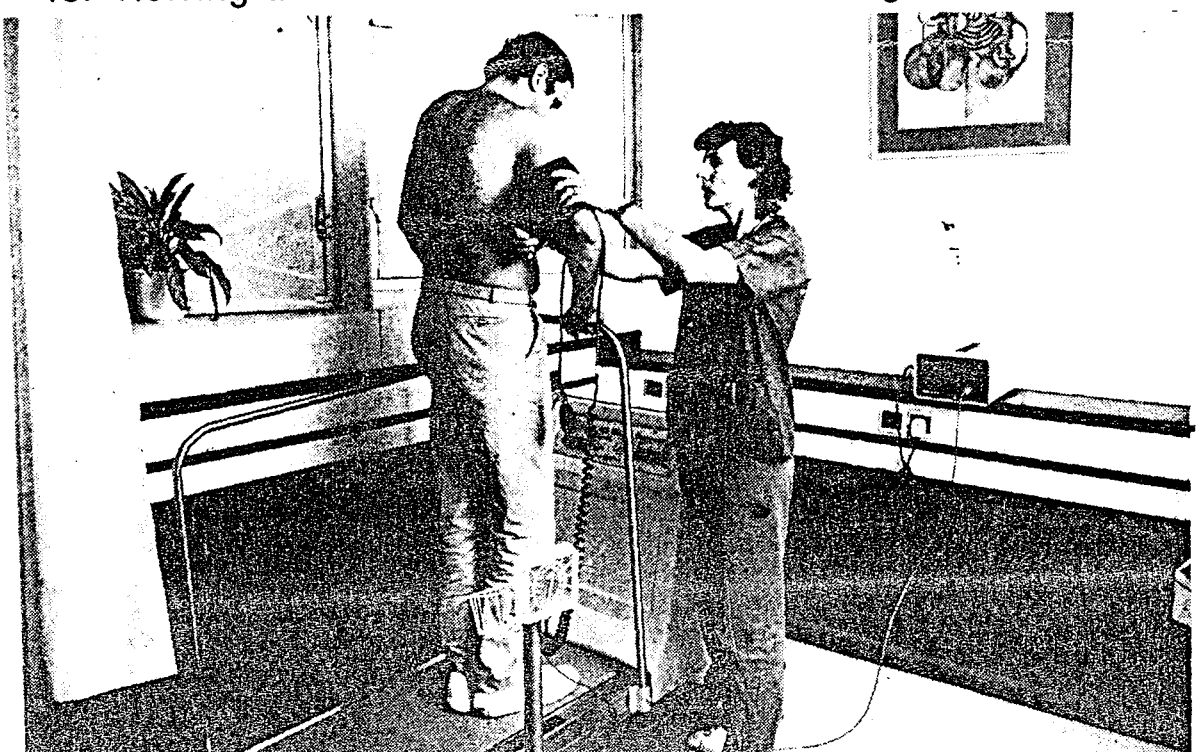
have been used as a meeting place for the gangs.

Other babies, according to San-

Stolen babies for s

A nuclear picture of the heart

Simson Garfinkel reports on a sophisticated procedure, developed with the aid of locally-developed equipment, for viewing the heart's blood flow without surgical invasion.



he way that the heart performs both at rest and when exercising depends on the blood supply it receives. (Ron Erde)

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But, using nuclear cardiology techniques similar to those practised at St. Luke's, Yeh can detect early damage to the heart that the drug may have caused and change the treatment. Another use of the imaging technique is to evaluate the hearts of patients who have had heart attacks and are now undergoing surgery for cancer.

"You have to find out how good the heart is," Yeh explains, before a patient is put under general anesthesia for cancer surgery.

By measuring the amount of radioactivity – and hence, blood – in the heart chambers between the times that they are relaxed and contracted, he adds, it is possible to calculate the fraction of blood that the left side pumps through with each stroke. This measurement – called an ejection fraction – should amount to over 50 per cent in a healthy heart; if it is lower, that indicates possible problems.

After the first measurement, the patient is asked to exercise, and a second heart scan is taken. If the pumping fraction is lower after exercise, Yeh notes, that is another sign of heart disease.

The idea of combining nuclear cardiology with exercise is catching on. In 1985, the nuclear medicine group at St. Luke's did 205 of these tests; in 1987 they did over 900, according to Ratner.

Another type of test that both groups perform is called a first pass scan. Instead of making a movie from several hundred beats, the doctor injects the patient with a single dose of radioactive material, which he tracks with the computer. As the isotope moves through the bloodstream, the patient's right auricle and then right ventricle light up on the computer screen. Then the lungs, and lastly the left auricle, left ventricle, and finally the aorta. It's like being able to watch the patient's blood flow through the body.

One of the advantages of the first pass technique, Ratner stresses, is that it can detect defects in the heart like leaky valves or small holes. Another advantage is that the patient doesn't have to have a regular heartbeat in order to create a decent movie.

In addition to measuring the blood as it is pumped through the heart, it is possible with this process to actually measure the amount of blood used by the heart muscle. This test uses Thallium-201, a radioactive compound that is concentrated in muscles in an amount proportional to the amount of work that they do.

Thallium-201 is injected into the patient who then exercises. The parts of the heart that use the most blood take up the most Thallium, making them shine more brightly under the camera. If the doctor sees any dark spots on the heart, that indicates that a part of it isn't getting enough oxygen.

After exercise, the patient is allowed to rest for two hours, after which the scan is repeated, Yeh says. While the patient is resting, the Thallium redistributes in the heart. If a spot that was dark is now bright, that means that its blood supply is only partially blocked. But if the spot is still dark, he adds, then that part of the heart is probably dead.

The test gives the physician a lot of information, but until recently there were a lot of patients who couldn't risk it – patients who were too old or frail or who had physical disabilities that prevented them from exercising, according to Dr. Ratner. But a new drug, Dipyridamole, allows doctors to simulate the effects of exercise on the heart. Dipyridamole, he notes, causes the blood vessels of the heart to expand – making them take up more blood – without submitting the patient to the stress that is associated with exercise.

Dipyridamole has not yet been approved by the FDA for general use, Ratner says, but in his tests with 250 patients over the last year, he has had not a single complication.

Stolen babies for sale

ıey believe he is already in ılaysia.

three years and selling them to a

The reason the baby trade is so lucrative, according to Mohamed Hassan, Malaysia's director general of social services, is because "Malaysians like Thai children, especial-

gle provides cover for them. The babies are usually carried in bags. We act on tip-offs or if we hear them crying."