THE BLACK VAULT

NEWS

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (202) 962-4155
WASHINGTON, D.C. 20546 TELS: (202) 963-6925

FOR RELEASE: FRIDAY P.M.
February 27, 1970

(ALSO RELEASED BY STANFORD UNIVERSITY MEDICAL CENTER, STANFORD, CALIF.)

RELEASE NO: 70-32

EXTERNAL MONITOR CHECKS HEART FUNCTIONS

Scientists from the Stanford University School of Medicine and the National Aeronautics and Space Administration's Ames Research Center successfully tested a new application of sonar (often called ultrasound) that can pry out secrets about the functioning of the human heart.

The new use of sonar, reported today at the meeting of the American College of Cardiology, New Orleans, can provide fundamentals of the heartbeat and blood circulation heretofore unobtainable without passing a catheter (a long thin tube) into one of the heart chambers.

That procedure, known as cardiac catheterization, requires many hours and the patient is usually hospitalized. Additional laborious procedures involve the taking of X-rays and blood samplings.

-more-

2/25/70

133

By contrast, ultrasound studies of the heart can be done by a well-trained person in the physician's office or at the patient's bedside in a matter of minutes. The technique can be applied as a screening procedure for patients with known or suspected heart disease. And it can be used to monitor precisely the heart's healing process in patients recovering from open heart surgery or from a heart attack.

Unlike standard monitoring devices, sonar measures precisely the amount of blood which is pumped out of the heart at each contraction of the heart muscle. It also measures the heart size and the backward flow of blood which indicates that the patient has a defective heart valve.

The Stanford and NASA Ames (Mountain View, Calif.) researchers conducted sonar studies in 51 patients undergoing standard catheterization. Their findings, obtained by ultrasound, correlated "reasonably well" with the degree of heart disease detected by the standard method, they reported.

The work began as a result of interest by NASA in ultrasonics as one of several techniques for using external instrumentation for medical research during manned space flights, and coincided with interest in ultrasonics at Stanford.

-more-

The new use of sonar was described by Dr. Richard L. Popp, a postdoctoral fellow in cardiology at the Stanford University School of Medicine, and Dr. Donald C. Harrison, associate professor and chief of cardiology at Stanford. Working with them on the project is Dr. Harold Sandler, chief of the Biomedical Research Branch of the Ames Center.

The Stanford work is supported by grants from NASA Ames, the National Institutes of Health and the American Heart Association.

NASA is seeking devices to collect and record information on human heart action during space flights, according to Dr. Harrison, the principal investigator. Now that the use of sonar in heart monitoring has proved its value, work will begin to build ultrasound devices small enough to be carried in orbiting space laboratories.

In addition, scientists will study the use of computers for storage, retrieval and instant interpretation of ultrasound recordings received on Earth.

The instrumentation work will be done by researchers at NASA's Ames. Testing of the new devices in human patients will be conducted by Dr. Harrison and his associates at Stanford.

The sonar recordings on heart patients in the recent Stanford study were made by using a commercially available machine which emits and receives high-frequency sound waves.

As sonic impulses were bounced against front and rear walls of the heart, they were recorded and converted into electrical signals which were displayed on a television screen.

From the patterns of ultrasonic echoes, taken when the heart is relaxed and when it contracts the researchers developed a formula enabling them to calculate precisely the volume of blood ejected by the heart, and also determine the presence of abnormalities.

Dr. Harrison said that from a medical standpoint the technique is promising and warrants further investigation to refine it "because it is painless, simple and safer, and less costly to the patient than present methods."

Ultrasound is also being used at Stanford to detect heart changes that lead to early rejection in heart transplant patients.

-end-