



GATHERING DATA—Research Technologist Bryce Bates mans the gamma camera console where heart images are recorded and then refined by computerized enhancement to reveal abnormal functions. A retrieval system makes it possible to recall any image in the memory bank for further study. (Photos by Thad Sparks)

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--- New Gamma Camera ---

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of a patient's heart over a relatively short period of time.

Little Discomfort

"That's one of the principal advantages of the gamma camera. We can put a patient on the table time and again and he suffers very little discomfort. We can study him as he gets better. We can watch it as it happens."

The more common method of studying heart behavior is catheterization, which involves insertion of a hollow cylinder through a vein to the heart. Dyes are then forced into the heart and x-rays are used to detect abnormalities.

The gamma camera method—termed non-invasive because it does not require catheterization—has the additional benefit that it greatly reduces patient risk, Jones said.

Low Risk

"Cardiac catheterization risk approaches that of many common surgical procedures," he said. "With the use of the catheter, the risk is about what it would be if you had your gallbladder taken out, or an appendectomy. With the gamma camera it's about the same as having a blood sample taken."

He pointed out that non-invasive method is not likely to do away with the use of catheters, however.

"Catheterization is a valuable technique," he said, "and it gives us essential information."

The hardware that goes to make up the gamma camera consists of a large barrel-shaped radiation detector and a console which houses a computer core, tape recorder, multi-data storage bin, and all the electronics necessary to collect, refine, store and retrieve functional information on a patient's cardiovascular system.

Color Television

The color television set is an extra. It serves the added function of giving an investigator an immediate look at what is going on in the patient's heart. And although the television in age is an unrefined piece of data, it still is enough to give a definite idea about the heart's general behavior.

Specifically, the gamma camera gathers data which reflect the pattern of blood flow with each beat of the heart. Up to 400,000 counts per second can be recorded. The more radioactivity picked up by the detector in a particular area of the

heart, the higher the count.

By use of this information an investigator is able to determine with an extremely close degree of accuracy the time it takes for blood to pass through each chamber of the heart, a critical piece of data in diagnosing abnormality. It is the kind of information that is not available through other techniques.

Many Applications

Jones sees a number of applications

for the nuclear method, ranging from diseases affecting coronary arteries and cardiac valves to congenital defects in children and left-to-right shunts, when blood in the heart is diverted from its normal channels.

One use of the gamma camera which Jones stresses as having great potential benefit is in the area of surgery involving replacement or repair of heart valves.

"In these cases," he said, "it's important to be able to check heart valve function before and after the operation. It's easier, faster and there's less risk if the procedure is non-invasive."

Routine Pump Checks

Another important use, he said, would be in cases where it is beneficial to be able to run routine checks on the left ventricle, which is the heart's principal pump.

The most recent development in gamma camera application, and one which Jones sees as holding great potential, focuses on measurement of changes in a patient's heart activity while he is undergoing exercise. Traditionally, all studies are done while the patient is at rest.

As for comparative costs of the invasive and non-invasive methods, Jones pointed to the difficulty in coming up with exact figures due mainly to the fact that it is impossible to say how often the gamma camera would be used once it goes into regular service.

Costs and Savings

Basic costs, however, do give a general idea of potential savings. A good catheterization laboratory costs about \$1 million, he said, while a gamma camera runs about \$125,000 to \$150,000, depending on what specific components are desired.

A further indication of the difference in cost, he said, is that catheterization takes about two hours to complete and requires the services of two technicians and a doctor whereas the gamma camera procedure lasts no more than 15 minutes and can be handled by just one technician.

"But it's not just a matter of cost," Jones said. "Patient comfort and reduced risk are probably more important considerations."

More Comfortable

"What I'm saying is that with the gamma camera we can do heart studies with less discomfort to the patient, and we can do them cheaper and faster. It doesn't give us all the same data—the catheter is better for some things—but what it does do is furnish the kind of information in a lot of cases that could make catheterization unnecessary.

"It's impossible to say what percentage of cases might be affected," he said, "but there would be a great number, there's no doubt of that."



March 26-April 2, 1976

The Intercom Calendar lists lectures, symposia and other activities at the medical center. For information on regularly held meetings, please contact the department in charge. Special departmental notices will be accepted for the Calendar no later than one week prior to publication. Notices may be sent to Box 3354, Hospital.

Friday, March 26

1 p.m.

Network for Continuing Medical Education, programs on "Head Trauma: Evaluation for the Non-Neurosurgeon," "Office Gynecologic Cancer Screening" and "A Shoulder Examination." View in Rms M-405, M-410, 2031 and the Medical Student Lounge (Channel 7 or 9) at Duke and Rms A3002 (by appointment only), C9013, D3008, CCU and the classrooms and media learning lab of the Allied Health Bldg. at the VA Hospital.

4 p.m.

Joint Department of Microbiology and Immunology and Department of Surgery Seminar. Dr. Thomas Graf of the Max Planck Institute in Tubingen, West Germany, will speak on "Recent Studies with Avian Leukemia Viruses."

Monday, March 29

Noon

American Medical Student Association, programs on "Legal Problems in the Wards," "The Naranjate Body" and "Legal Problems in the Emergency Room." View in the Medical Student Lounge (Channel 7 or 9).

Tuesday, March 30

Noon

AMSA. See Monday, March 29 for program listing and viewing area.

1 p.m.

Network for Continuing Medical Education. See Friday, March 26, for program listing. View in the School of Nursing Auditorium, Rm 1017.

Wednesday, March 31

1 p.m.

Network for Continuing Medical Education. See Friday, March 26, for program listing and viewing areas.

Thursday, April 1

Noon

AMSA. See Monday, March 29, for program listing. View in the School of Nursing Auditorium, Rm 1017.

1 p.m.

Network for Continuing Medical Education. See Friday, March 26, for program listing and viewing areas.

Friday, April 2

12:30 p.m.

Biochemistry Seminar. Dr. Allan D. Roses of the Division of Neurology here will speak on "Erythrocyte Membrane Phosphorylation in Myotonic Muscular Dystrophy. (A Testable Hypothesis for the Molecular Defect in a Human Genetic Disease.)" in Rm 147, Nanaline H. Duke Bldg. Coffee will be served at 12:15 p.m. in the lobby.