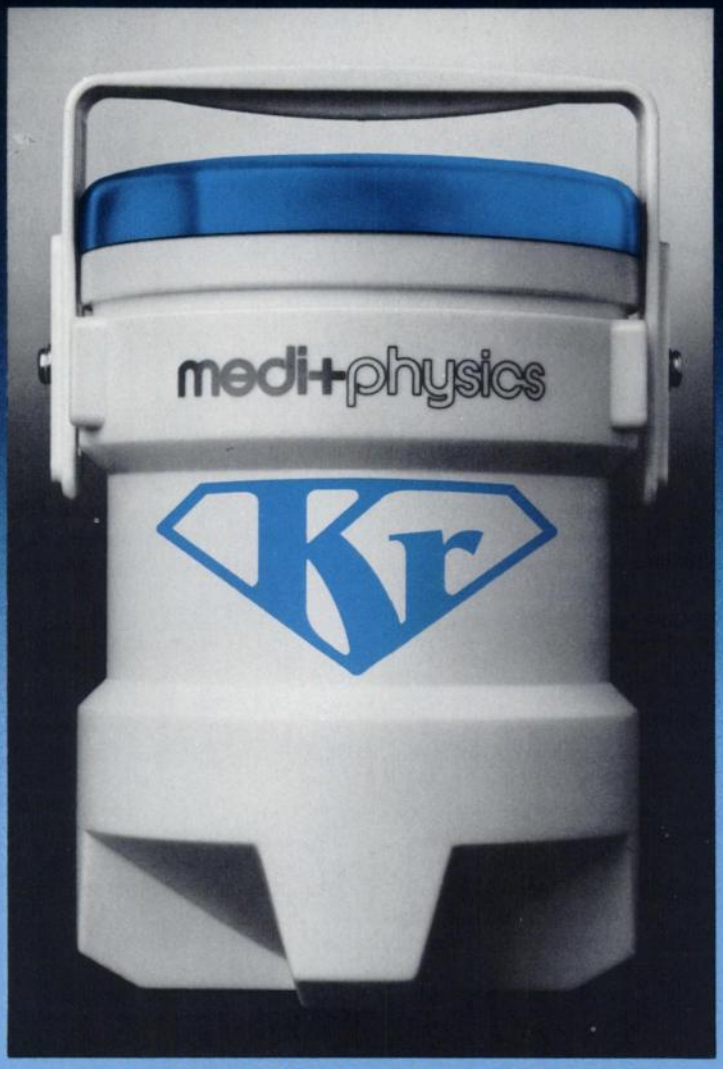
medi+physics

Announces An Ideal Radioisotope For The Study of Pulmonary Ventilation

- A half-life of 13 seconds and decay by Isomeric Transition means low radiation exposure to patients and staff.
- The monoenergetic gamma emission of 191 keV is well suited for the gamma camera.
- No special radioactive gas collection or disposal system required.
- Completely portable system allows studies in ICU, CCU, and Post-Surgical departments with portable camera.



MPI Krypton Kr 81m Gas Generator
Krypton Kr 81m

- Studies can be conducted on comatose, uncooperative, or mechanically vented patients.
- Distribution of radioactive gas is mainly to the lungs.
- Elaborate delivery system is not required.
- The only radioisotope that can be administered ON and OFF as needed.
- Easy to license when compared to Xenon Xe 133 gas.

The Pulmonary Profile

THE CONCEPT

The pulmonary profile is a series of matched perfusion and ventilation studies done consecutively on a patient using the MPI Krypton Kr 81m Gas Generator and Technetium Tc 99m Albumin Aggregated. Following administration of the two products you are able to switch the energy window on the gamma camera and scan the patient in the same position for each of the isotopes before you move the patient to the next view. Thus, a complete series of matching views may be accumulated for any number of patient positions.

THE PURPOSE

To increase the diagnostic sensitivity and specificity of lung imaging procedures by providing an easy means of obtaining matched perfusion-ventilation images in one patient visit.

THE RESULT

A *new* patient study which combines ventilation and perfusion imaging procedures into one study called the *Pulmonary Profile Study.*

For information regarding the MPI Krypton Kr 81m Gas Generator Krypton Kr 81m please call Medi-Physics at (415) 658-2184, Outside California (800) 227-0492 or Inside California at (800) 772-2477.

medi+physics™

For complete prescribing information please consult package insert, a summary of which follows:

MPI KRYPTON Kr 81m GAS GENERATOR
KRYPTON Kr 81m

DESCRIPTION: The Krypton Kr 81m Gas Generator consists of Rubidium Rb 81 fixed to a solid support from which the Krypton Kr 81m is eluted by passage of humidified oxygen or air through the generator. Other rubidium radio-isotopes which do not decay to radioactive Krypton Kr 81m in their decay are present in the generator (Rubidium Rb 82m, for example, is present at a concentration of 30-40%).

INDICATIONS AND USAGE: The Krypton Kr 81m Gas Generator is indicated for use in the study of pulmonary ventilation.

CONTRAINDICATIONS: None known.

WARNINGS: None known.

PRECAUTIONS:

General

The Krypton Kr 81m Gas Generator as well as other radioactive drugs, must be handled with care to minimize radiation exposure to clinical personnel. Also care should be taken to minimize radiation exposure to the patient consistent with proper patient management.

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenic potential, mutagenicity potential, or whether Krypton Kr 81m gas affects fertility in males or females.

Pregnancy-Category C

Animal reproduction studies have not been conducted with Krypton Kr 81m gas. It is also not known whether Krypton Kr 81m gas can cause fetal harm when administered to a pregnant woman, or can affect reproduction capacity. Krypton Kr 81m gas should be given to a pregnant woman only if clearly needed.

Nursing Mothers

It is not know whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Krypton Kr 81m gas is administered to a nursing woman.
Ideally, examinations using radiopharmaceuticals, especially those elective in nature, in women of childbearing capability, should be performed during the first few (approximately ten) days following the onset of menses.

Pediatric Use

Safety and effectiveness in children have not been established.

Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the safe use and handling of radionuclides and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

ADVERSE REACTIONS: None known.

DOSAGE AND ADMINISTRATION: The recommended dose range for Krypton Kr 81m is 1-10 millicuries and should be administered by continuous inhalation for a sufficient time to provide desired diagnostic information. The multiplication product of the radioactivity and the time of continuous inhalation of Krypton Kr 81m generally should not exceed 100 millicurie-minutes.

HOW SUPPLIED: The Krypton 81m Gas Generator is supplied in the form of Rubidium Rb 81, bound to a solid support, with an activity of 2-10 millicuries at calibration time. The generator is enclosed in a lead shielded filter assembly surrounded by a capped plastic canister to which a handle is affixed. The generator should be stored at room temperature. The generator expires 12 hours after date and time of calibration.

Pick a n

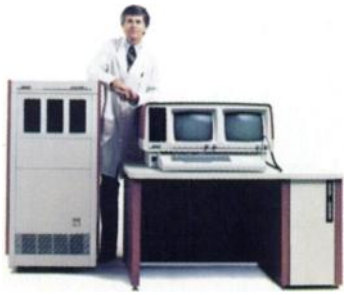
Any of these four ADAC nuclear medicine systems will deliver useful clinical information faster and more accurately than ever before possible.

And one has exactly the capacity your clinic or hospital needs today.

That's the one to buy.

Later, as you expand, your ADAC expands with you.

ADAC System I.



It processes and acquires.

It has a Diagnostic Acquisition/Processing Console, a Computer Section, and a Winchester disc drive.

It can easily be expanded to a System II.

ADAC System II.

It processes one study while acquiring or processing another.

It's a System I—plus a Remote Acquisition/Processing Terminal, a second Computer Section, and a second Winchester.

It can easily be expanded to a System III.

umber.

ADAC System III.

It processes and acquires in two places at once.
It looks just like a System II.
But there's more capability inside the Computer Section.
It can easily be expanded to a System IV.

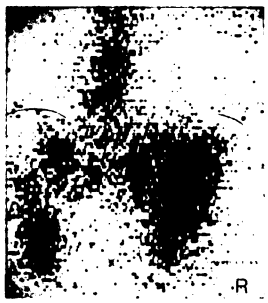
ADAC System IV.

It has a three-location option.
With two Consoles and an expanded Computer Section, you can process and acquire in two places at once.

Add an optional Remote Terminal and you can process and acquire studies at three locations.

For more information on ADAC Systems I, II, III, & IV, write or call collect. ADAC Laboratories, 255 San Geronimo Way, Sunnyvale, California 94086. (408) 736-1101.

ADAC
Nuclear Medicine Computers



1970

1980

Brought to you in part by NEN

For the past decade, nuclear medicine has enjoyed a continuing stream of new radiopharmaceuticals, new isotopes, new diagnostic procedures — and new patients. Many of these new diagnostic procedures resulted directly or indirectly from the investments in product research and development, testing, production, and promotion by a single company: New England Nuclear.

We supported investigators with grants to develop their ideas into agents suitable for animal and human testing... we invested in the production facilities to manufacture sufficient quantities of radiopharmaceuticals and isotopes to perform the studies necessary to bring new products to you.

And then, we underwrote an effort unique in nuclear medicine — we began spending hundreds of thousands of dollars each year to inform primary-care physicians and specialists why they should send their patients to nuclear departments for these new studies.

Such investments in new product development and physician education are common among traditional pharmaceutical companies producing proprietary products that can be patented. However, all NEN's investments were made on products for which no exclusivity of patent protection was available. Some of NEN's investments were not successful. A few were, however — and they profoundly changed nuclear medicine.

Of course, NEN could have waited for other companies to develop new procedures and products... to carry the risk and investment of pioneering trial and error. We could have waited until someone else created a demand for new isotopes, and then capitalized on their efforts.

Instead, we built *four* of our own cyclotrons, and are currently building a multimillion-dollar linear accelerator — further evidence of NEN's unique commitment to research and development innovation in isotope and radiopharmaceutical production.

If NEN had not been so committed to advancing nuclear diagnostics, perhaps bone scans might still be done with strontium... and techniques such as tumor, abscess, and myocardial perfusion imaging might still be subjects for academic — not clinical — consideration.

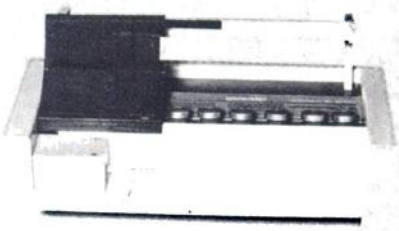
NEN has maintained a high level of customer acceptance of its isotopes and radiopharmaceuticals, thanks to physicians and technologists who understand that when they trust their business to NEN they are sharing our investment in future nuclear diagnostics... in the profession's future ability to diagnose diseases for which medicine has no agents today ...and in the effort to communicate the benefits of nuclear diagnostics to the medical community.

NEN New England Nuclear®

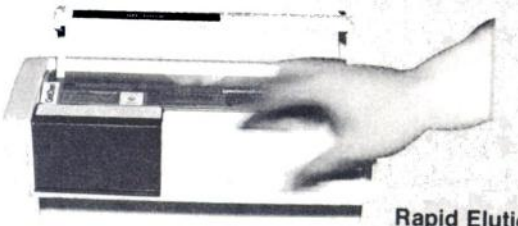
CintiChem®

Technetium 99m Generators

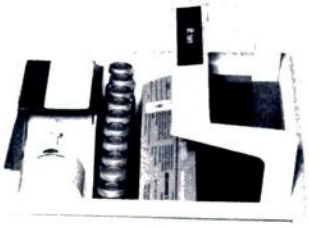
(Technetium Tc 99m Generators for the Production of Sodium Pertechnetate Tc 99m)



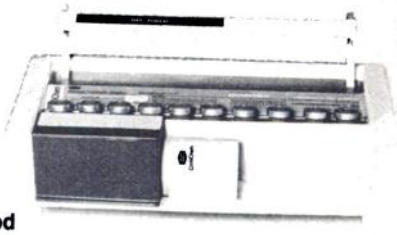
Shielded Elution Transfer Point



Rapid Elution Vial-Needle Engagement Reduces the Radiation Exposure Time Factor



"Automatic" Elution Vial-Needle Alignment Eliminates the Need for Direct Eye Exposure



Elution Transfer Point Shielded Hood Maximizes Radiation Protection During the Elution Process Itself

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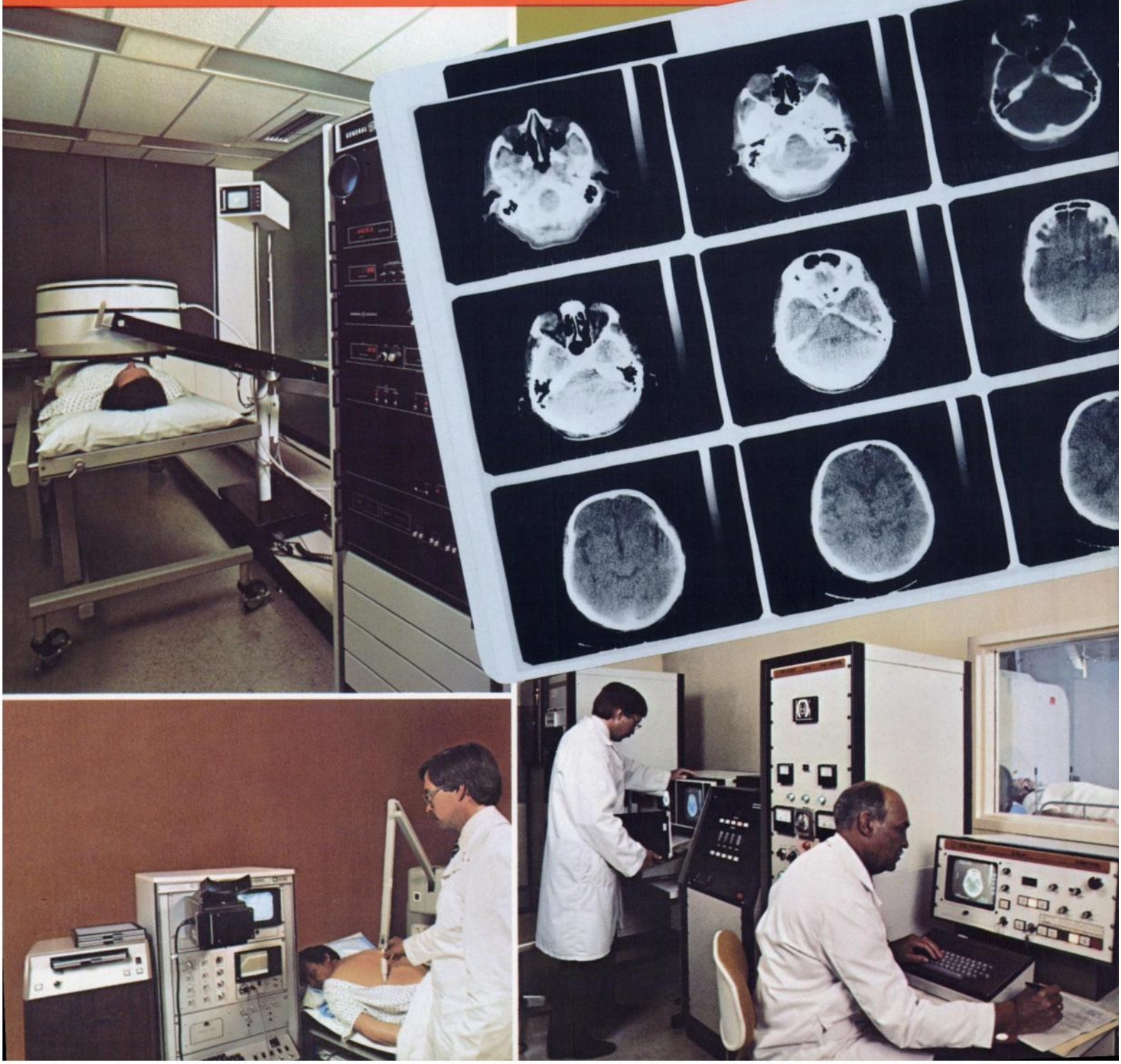
827-1

SCOPIX® CR3 Universal CRT Imaging Film



The one film for all your computed tomography, ultra-sound and nuclear medicine imaging needs...

Up to now, if you wanted good CRT image recording from computed tomography, ultra-sound and nuclear medicine equipment, you may have used several different "special purpose" imaging films.

We started with a conviction that a more convenient universal emulsion film was desirable and possible. The result is Agfa-Gevaert's new SCOPIX CR3 Universal CRT Imaging Film . . . the *one* film that does it *all!*

It is a film matched to the spectral emission of white, blue and green phosphors used for CRT displays and video monitors.

Matched Response To All CRT Displays.

The broad spectral sensitivity of SCOPIX CR3 Film ensures accurate and detailed recording from greyscale CRT and video monitors which use white, blue or green phosphors in their display tubes. It is the "blindness" to green phosphors which causes other films to exhibit higher grain and less definition.

SCOPIX CR3 Film is a single-coated, orthochromatic, medium speed film of relatively high contrast, which gives outstanding recording of CT scan, ultra-sound and nuclear video images.

Sharper Image

Its higher speed allows CRT monitor intensity to be decreased, thus reducing the "halo" effect on the video screen and improving image definition.

SCOPIX CR3 Film is single-coated on GEVAR polyester base, with anti-halation layer. This combination enhances image detail and definition by preventing image parallax. It is suitable for all RP and manual film processing.

With SCOPIX CR3 film . . . you purchase *fewer* film types and *simplify* film inventory; get improved and consistent *quality* and *economy* because *one film does it all!*

For additional information, contact your nearest Agfa-Gevaert Rex Representative or call 914-682-5650.

Image Quality and Support Second to None.

Agfa-Gevaert Rex offers a complete line of superior, sensitometrically dependable X-ray films. All have the finest definition and image quality to help make precise diagnoses. And all offer appropriate speed for the desired technique. Whether it's general purpose radiology, or special procedures such as cinefluorography, angiography or mammography, Agfa-Gevaert has the film to meet your diagnostic needs.

SCOPIX CR3 Film
The *one* film that does it *all*!

Photos courtesy Mt. Sinai Hospital, N.Y.

AGFA-GEVAERT REX, INC.

A Subsidiary of the Agfa-Gevaert Group, the second largest photo products manufacturer in the world.
Headquarters: White Plains, NY 10604 / Tel. 914-682-5650 ■ In Canada contact: Photo Importing Agencies, Ltd. / Exclusive Distributor

ISOTRON

INVENTORY CONTROL COMPUTER

This small desk top microprocessor computer provides complete inventory control and NRC record keeping functions for the nuclear medicine department.

It is user programmable — you program it to fit your requirements even down to the half-life of the radionuclide so the Isotron never becomes obsolete in the rapidly changing field of nuclear medicine.

The Isotron can keep track of up to 20 different radiopharmaceuticals simultaneously by both radionuclide and chemical form! Updates the quantity of radioactivity every minute to reflect radioactivity decay.

The Isotron performs patient dose/volume calculations.

The Isotron subtracts the administered dose from the decayed activity and provides a running total of remaining activity.

The Isotron performs future time calculations. If it is 8:00 A.M. and you want to draw up a dose for 1:00 P.M. the calculation is simply and rapidly performed.

An optional hard copy data printer is available with the Isotron, known as the Isocord, which provides three copies of all pertinent data for your record keeping.

The Isotron may be used with any manufacturers dosecalibrator.

The Cost? Very reasonable. When combined with the Isocord and our Assayer 1 Dosecalibrator the total price is less than competitive systems with 50% of the capabilities.

RADX gave you the first calculating dosecalibrator, the first printing dosecalibrator, and now the first desk top inventory control computer, the ISOTRON.

For more information or to arrange a demonstration call our toll free number 800-231-1747 (Texas customers call 713-468-9628.)

RADX

P. O. Box 19164 Houston, TX 77024

When Toshiba gave nuclear medicine the world's first jumbo gammacamera in 1973, the medical community was very impressed. But we were dedicated to giving you more, so we introduced the world's first jumbo gammacamera with high resolution, fine diagnostic detail over a large area. That was important, but we knew it still wasn't enough.

Now, we are introducing the latest in the state-of-the-art, the GCA-402. The world's first Super High Resolution, Large Field Gammacamera combining stability and exceptional workload capability in one instrument. Frankly, we're pleased.

Toshiba's system approach allows for no compromise where clinical diagnostic values are concerned. The GCA-402 is a prime example. High resolution is the basis for obtaining useful diagnostic images. The intrinsic resolution and linearity of the GCA-402, combined with its range of ten collimators provides unsurpassed images of exceptional diagnostic value. The GCA-402 incorporates 61 photo-multiplier tubes to electronically smooth the image and eliminate the high-energy collimator hole patterns unavoidable in conventional systems. Its 35cm field of view combined with 17 preselected isotope ranges allows unobstructed views of large organs, or groups of organs, as well as whole body scanning.

Toshiba's patented* delay line system and modern IC-technology provide long term stability, trouble free performance, and ease of operation.

Of course, the GCA-402 has a wide range of accessories including special collimators, whole body scanning bed, video tape and film recorders, plus, the GCA-402 may be interfaced to any computer.

This combination of human engineering, fail-proof auto exposure and easy collimator changeover provides the highest efficiency while minimizing patient discomforture.

When you're ready to fill your nuclear medicine department's need for a large field gammacamera, remember Toshiba. We're the first.

*Patented Delay Line, U.S. Patent Number 3,717,763

Our third is first again

Toshiba's GCA-402 Jumbo Gammacamera

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A NEW DOSE CALIBRATOR WITH A MEMORY BETTER THAN YOURS.

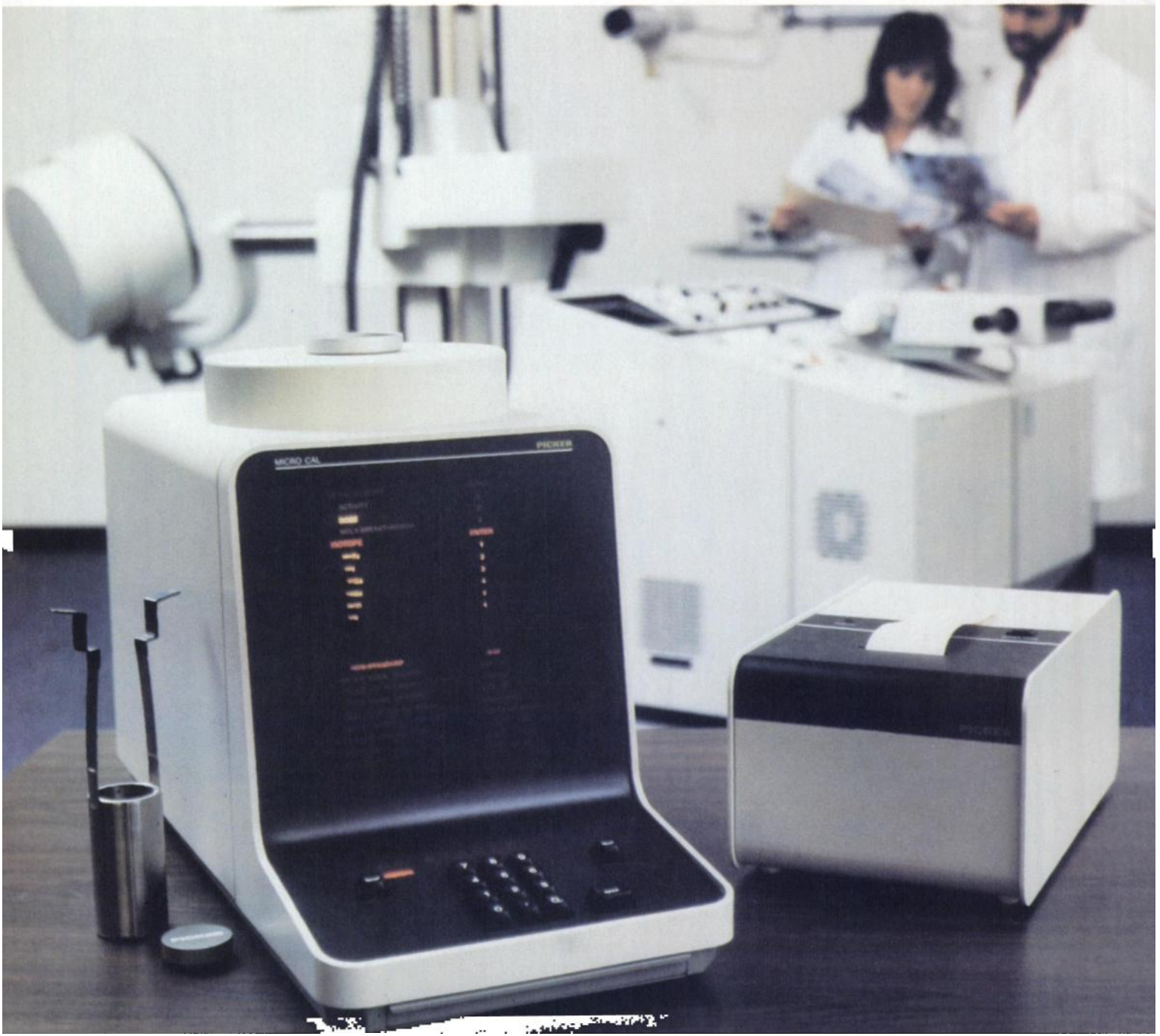
New Micro Cal, from Picker, does everything your present isotope calibrator does — and everything you wish it did.

Micro Cal automates dose calibration. A keyboard operated microprocessor memory stores calibration factors for up to 96 radioisotopes. And an exclusive prompting panel lights up to provide the technologist with easy step-by-step instructions for each setup. Micro Cal calculates dosage, correcting for isotope decay and the time the dose is to be administered, while its printout accessory gives you a hard copy record. Micro Cal figures dosage fast and makes error virtually impossible.

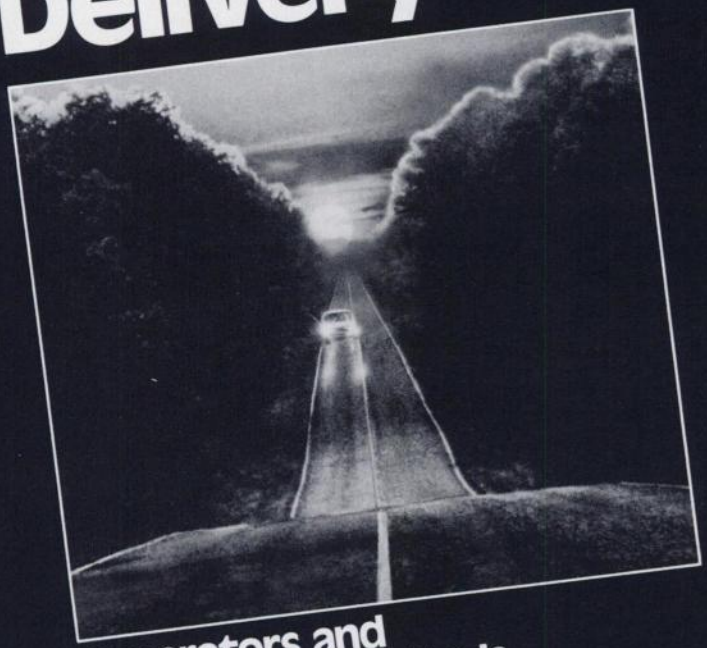
Since every phase of a nuclear medicine diagnostic process begins with correct dosage, Micro Cal is the beginning of a better diagnosis. For more information, call your Picker representative or write: Picker Corporation, 12 Clintonville Rd., Northford, CT 06472, or Picker International, 595 Miner Rd., Highland Hts., OH 44143.

THE IMAGE OF VALUE.

PICKER®



Dependable Delivery



Generators and radiopharmaceuticals that arrive on time, week after week.

Mallinckrodt's generator delivery system is ranked number one* in the industry. Here's why:

Our mid-continental location means we can make most deliveries by truck. So for 90% of our customers in 45 states, the number one delivery problem—airline delays—is no problem at all. If there is a hitch, one quick call to our toll-free service number will straighten it out.

Mallinckrodt weekend generators are delivered no later than 8 AM every Monday. If you need midweek delivery, your generator will arrive by 8 AM Wednesday.

For dependable, on-time generator delivery, week after week, call your Mallinckrodt representative or this toll-free number:

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THE MALLINCKRODT COMMITMENT

to Nuclear Medicine

Mallinckrodt® Diagnostics

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*In a recent independent survey of 400 nuclear medicine departments. Data on file at Mallinckrodt.

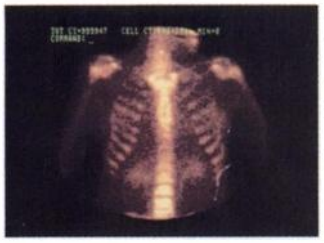
Why more small hospitals buy the imaging system owned by more large hospitals. Digital's Gamma-11.

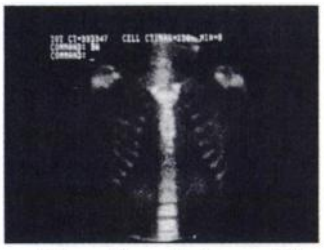
Digital's Gamma-11 is found in more large teaching hospitals and research centers worldwide than any other nuclear medicine imaging system. And the reasons these hospitals prefer the Gamma-11 are no different from the reasons you should choose it.

Your first reason for choosing the Gamma-11 is beautifully simple.
The Gamma-11 is designed for ease of use. The computer prompts you in English. So it's simple to learn, even if you don't know anything about computers. Nothing is mysterious, but you'll find the results remarkable.

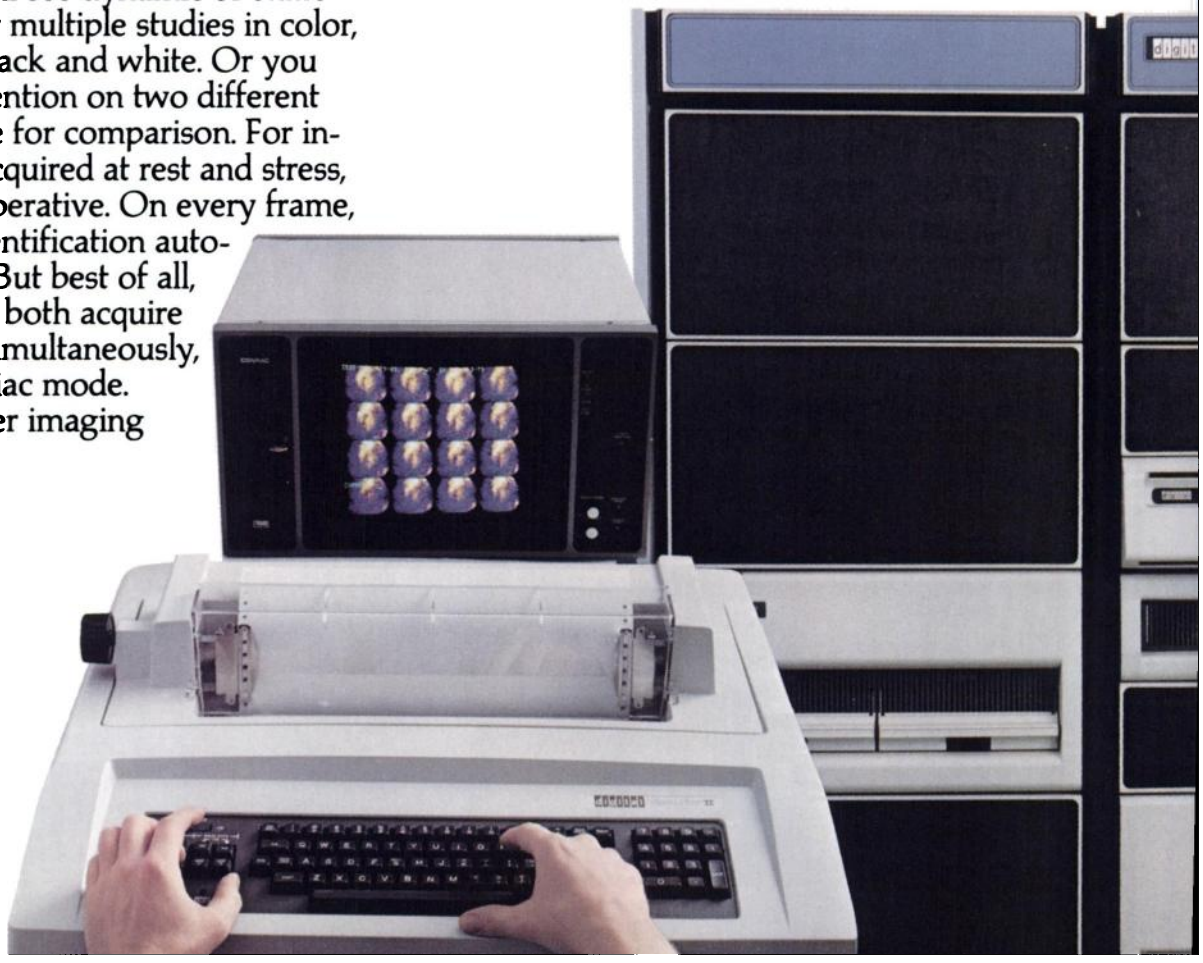
To help you with your job it does two jobs at once.
On the screen you'll see dynamic or static images of single or multiple studies in color, monochrome or black and white. Or you can focus your attention on two different studies side by side for comparison. For instance, an image acquired at rest and stress, or pre- and post-operative. On every frame, positive patient identification automatically appears. But best of all, the Gamma-11 can both acquire and analyze data simultaneously, even in gated cardiac mode. Something no other imaging system can do without expensive additions.

Digital's Gamma-11 will acquire, process, store, and display information so expertly and thoroughly that you can diagnose your patient's problem faster. With a greater degree of accuracy.





The information acquired from the Gamma-11 is gathered on a disk pack which has a much greater capacity for permanent information storage than, for example, the smaller alternative floppy disk. Also the disk, unlike the floppy, allows you to acquire data in both matrix and list mode.



As your department grows, so grows the Gamma-11.

What's more, the Gamma-11 is expandable. In fact our imaging system can accommodate up to three additional gamma cameras without requiring expensive interfaces. Since it's the finest on the market, you can easily and economically adapt the Gamma-11 to meet your growing needs. You don't have to worry about obsolescence either, as the first Gamma-11 installed 9 years ago is still up and running.

We'll support you with the IMAGE, so you'll see new developments.

All Gamma-11 owners receive the IMAGE, a newsletter for Gamma users from the Medical Systems Group at Digital. It's a forum for communicating with your peers and with the Medical Systems Group about significant developments involving Gamma-11 systems.

You'll read articles by users and be informed of upcoming symposia, shows, and meetings of relevance to Gamma-11 owners. So that at all times you'll be aware of new techniques and innovations in nuclear medicine as they relate to computer-operated imaging systems.

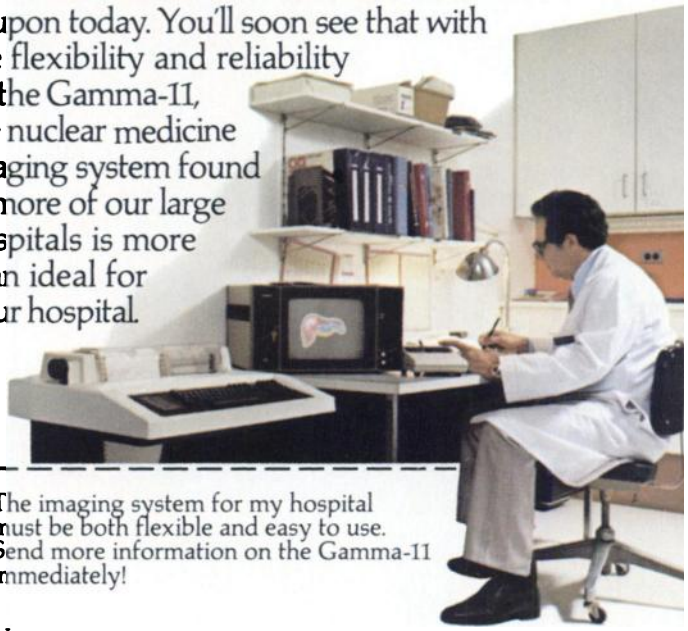
Digital can help you learn from the experienced.

In addition to clinical applications available from medical software firms, you can also get application packages from Digital and other Gamma-11 users. Such as the large teaching hospitals. So in effect, you'll be benefiting from their experience.

And many teaching hospitals have been using Gamma-11 systems since 1971. Which means that, in demanding circumstances, and over a lengthy period of time, Digital's system has proven itself in both reliability and performance.

The Gamma-11 comes with the acquisition software you'll need. Digital will provide on-site training plus information concerning university-based clinical training courses on the Gamma-11.

Find out more. Fill out and mail this coupon today. You'll soon see that with the flexibility and reliability of the Gamma-11, the nuclear medicine imaging system found in more of our large hospitals is more than ideal for your hospital.



The imaging system for my hospital must be both flexible and easy to use. Send more information on the Gamma-11 immediately!

Name _____

Title _____

Department _____

Hospital _____

Address _____

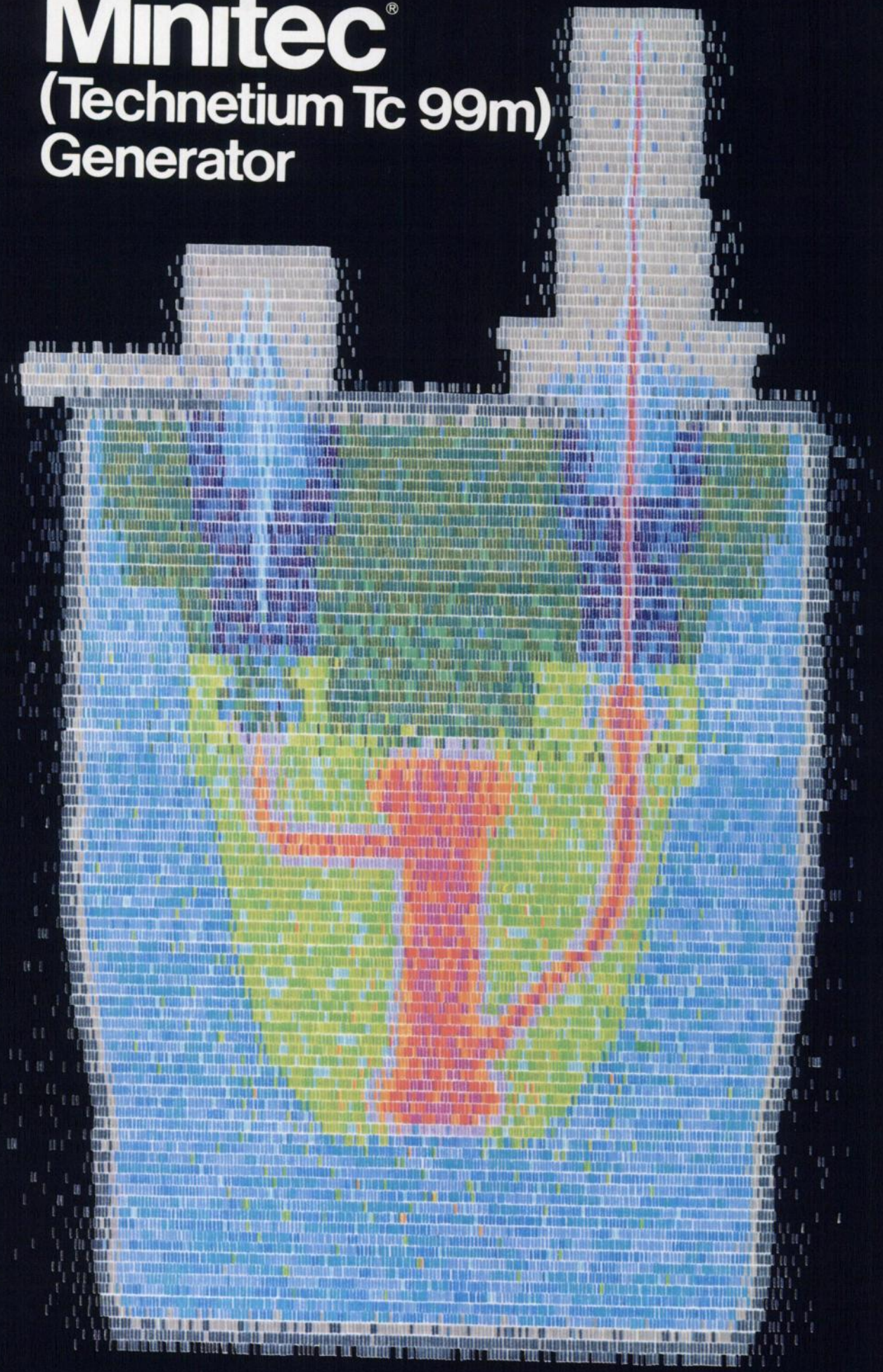
City _____ State _____ Zip _____

Digital Equipment Corporation, MS-1,
Attention: Mary Miller, Medical Systems Group,
MR2-3/E70, One Iron Way, Marlboro, MA 01752.

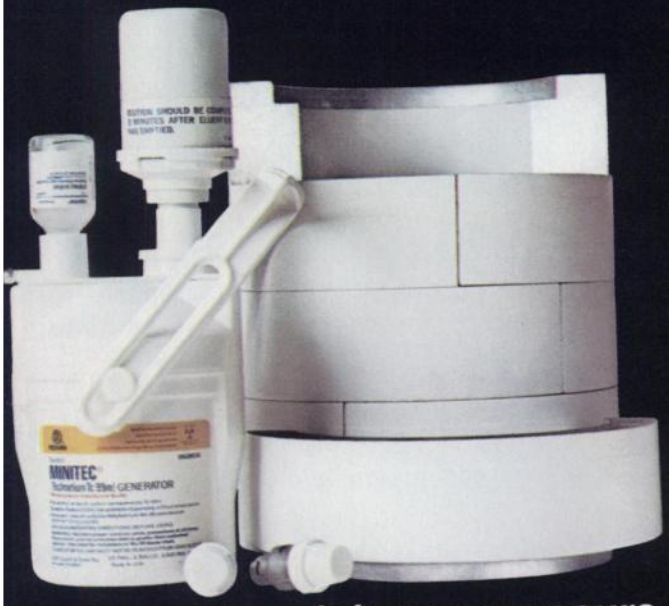
JN-9-0

digital

Minitec®
(Technetium Tc 99m) Generator



Hot where it matters
Cold where it counts



Designed for minimum exposure

—Unique construction (no exposed tubing) and thick shielding (1⅝" lead) provide high shielding-to-activity ratio.
—Another 1½" of lead shielding provided by Maxi-Shield™.
—Built-in handle reduces hand exposure during carrying.
—A comparison study of radiation exposure from the three leading generator systems is available from your Squibb Representative.

Convenient

—Available in potencies of 220, 440, 880, 1330, 1770 and 2220 mCi.
—Tuesday-calibrated generators delivered Wednesday a.m.
—Saturday-calibrated generators delivered Monday a.m.

Easy to operate

—After a few simple preparations, Minitec elutes automatically and quickly. Subsequent elutions are even simpler.
—Small-volume, high-concentration eluates give maximum flexibility for varying applications.

On-time delivery

—Express ground transportation and special air system assure on-time deliveries.

Dependable service

—Specially trained Technical Associates and Squibb Technical Customer Service provide prompt personal attention when needed.

See next page for brief summary.

Minitec®
(Technetium Tc 99m) Generator

Medotopes®

SQUIBB®

Quick Response

Call in your radiopharmaceutical orders by 2:30 PM today... get what you need by 8:00 AM tomorrow.

Through the years, Mallinckrodt's customer service system has been refined until it's second to none for prompt, dependable deliveries.

For example, our schedule is designed for *your* convenience...and your time zone. Just call by 2:30 PM *your time*, specify early delivery, and you'll have the radiopharmaceuticals you need no later than 8:00 your time the next morning.

Find out how our schedule can help keep your department on schedule. Call your Mallinckrodt representative or this toll-free number:

800-325-3688 (In Missouri, 314-895-0880 collect)
For technical assistance, it's 800-325-8181

THE MALLINCKRODT COMMITMENT

Mallinckrodt® Diagnostics

to Nuclear Medicine

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ohio-nuclear

Mobile Power You Can Control.

Take it anywhere—and interface it with any gamma camera.

Newest of our Spectrum One nuclear medicine computers and cameras, the MCS-560 makes analysis of cardiology and nuclear medicine procedures easy.

Easy To Use.

The MCS-560 is the most powerful mobile nuclear medicine computer anywhere. Sophisticated analysis is easy with: ☐ conversational programs ☐ pushbutton protocols ☐ unique MEDI-BASIC programming language ☐ built-in ECG Isolator/Detector ☐ unique tomographic reconstruction programs.

Backed by our own dedicated nuclear products service team, we're building our one-source reputation for excellence.

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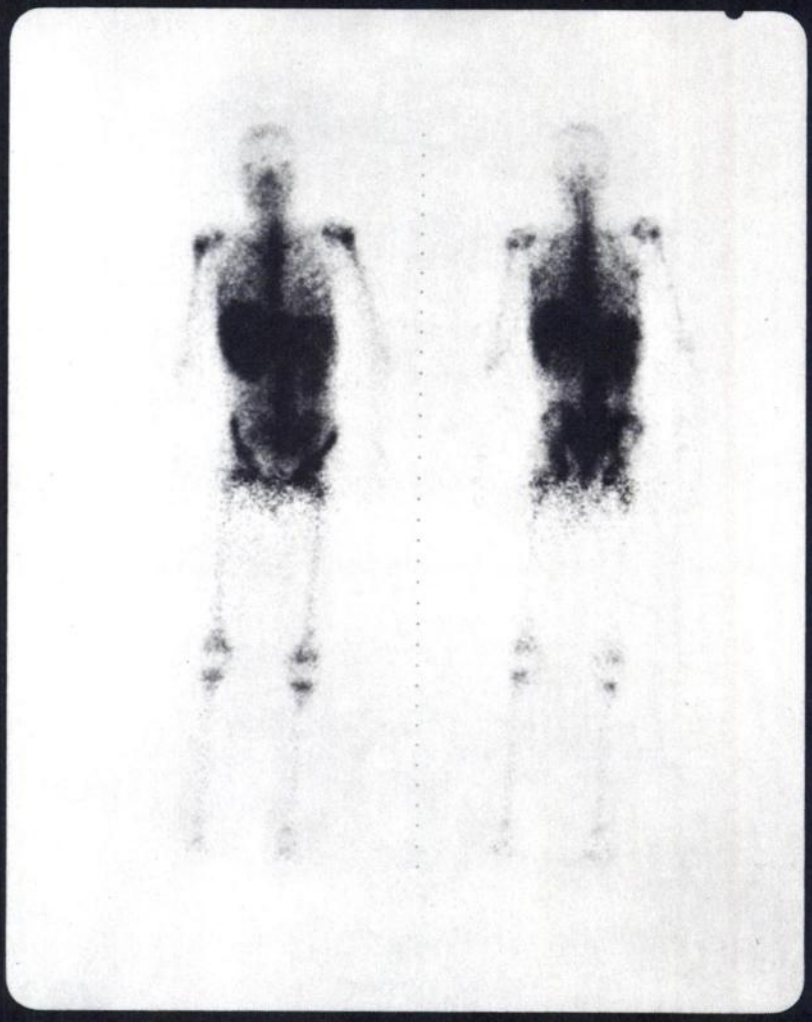
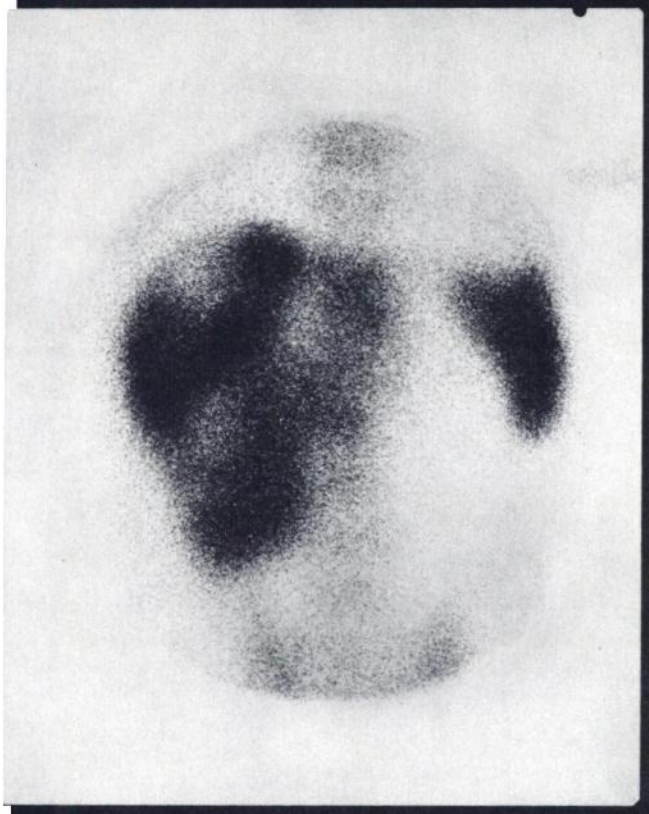
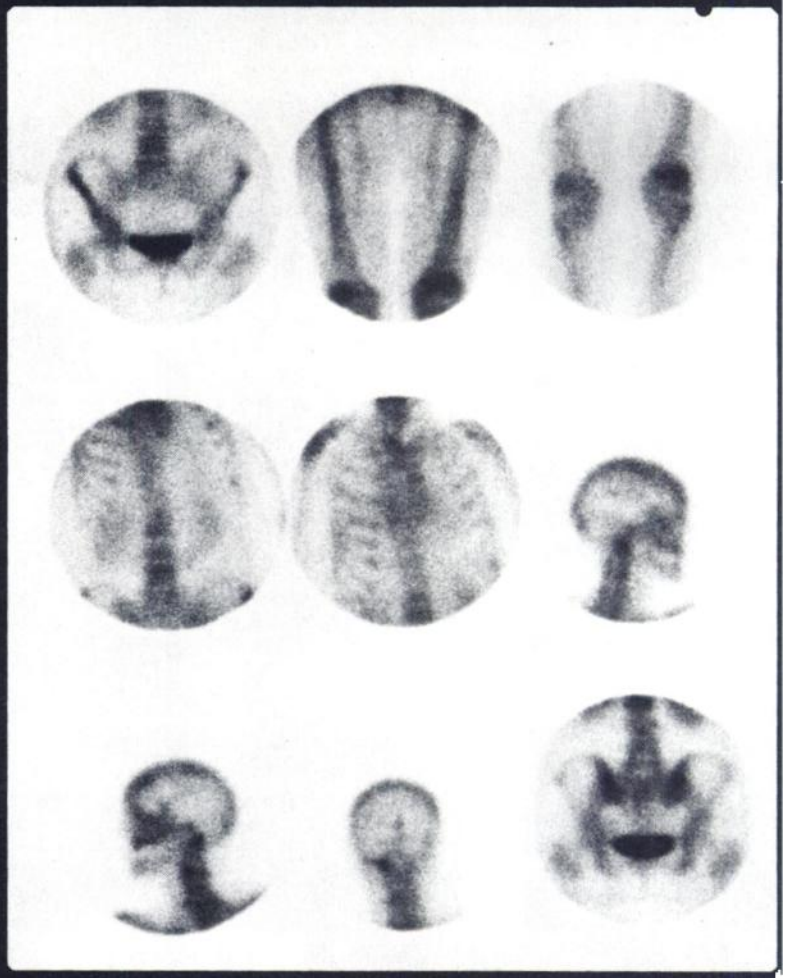


NUCLEAR IMAGES ON *KODAK* FILM: SHARP.





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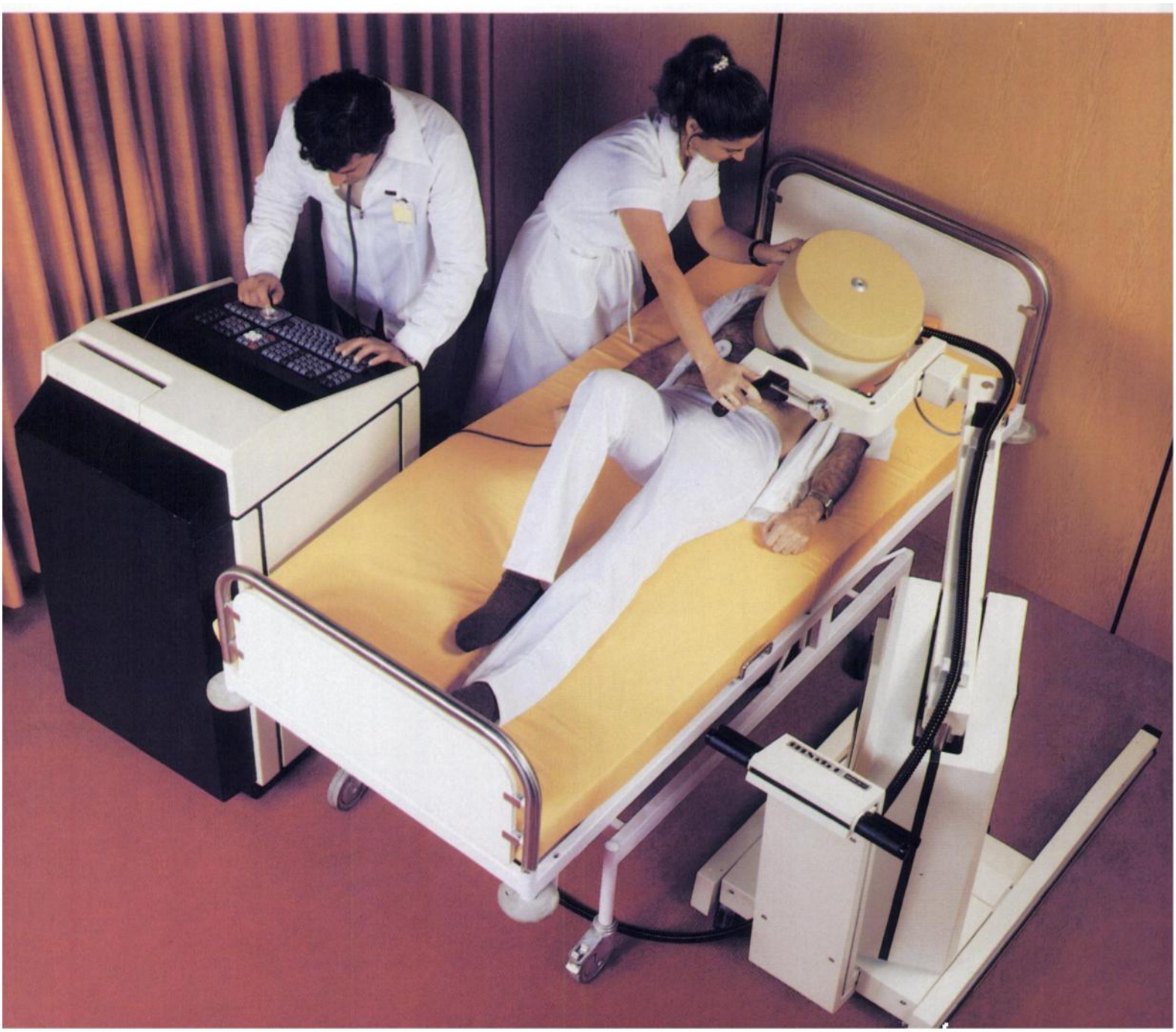
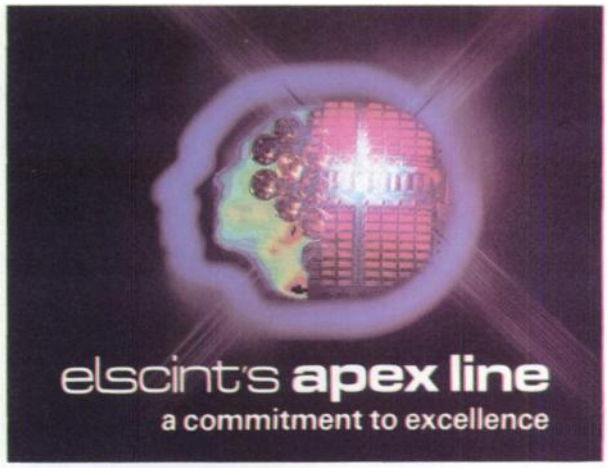
multicrystal count rates with single-crystal image quality

Another unique feature of the Apex Line



In the practice of modern Nuclear Medicine, physicians have learned that a camera's major diagnostic advantage is often negated by a parallel disadvantage.
High count rate is one such case.
Until Apex, high count rates were achievable only with multicrystal cameras—at the expense of image quality. Only Elscint's Apex Line provides count rates as high as 500,000 CPS and resolutions as fine as 1.8mm bars (Apex 215M).



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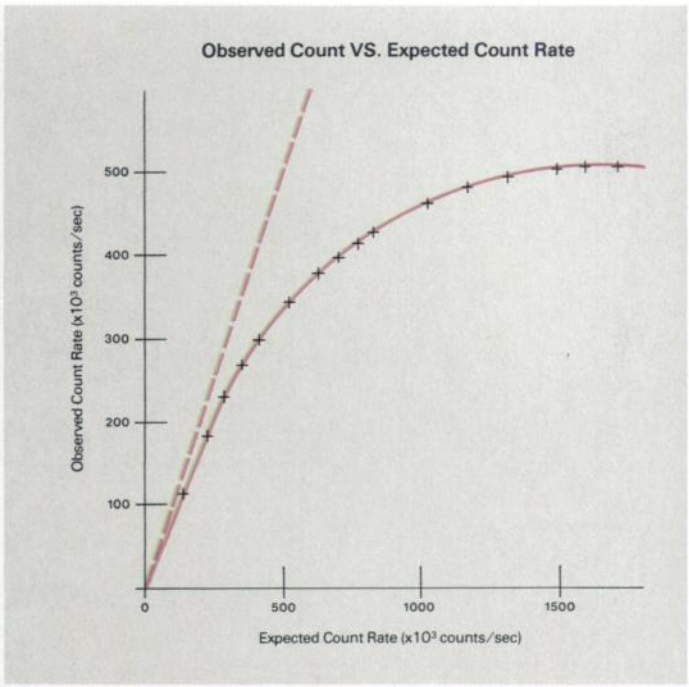
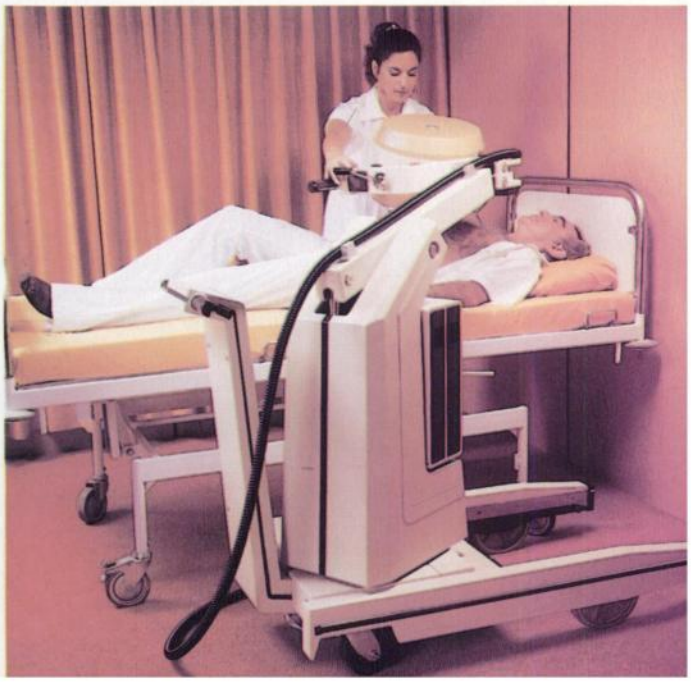
High Count Rates—The Clinical Need

As Nuclear Medicine techniques become more sophisticated, they require higher count rates. Cardiac first-pass studies, for example, can only be effectively accomplished with count rates exceeding the limitations of most present day gamma cameras. Apex systems, however, do perform these studies—with remarkable image clarity.



Some Impressive Apex Qualities

The remarkable *Count Rate* performance of the Apex Line is supported by a high *Dynamic Frame Rate* of 64 FPS for 64×64 pixels, and a *Multigated Frame Rate* of 64 frames per heart cycle for 64^2 matrix.



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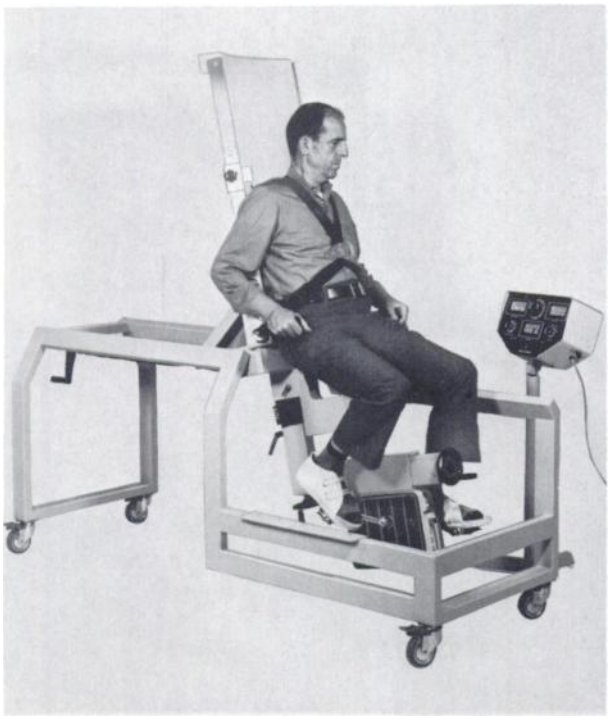

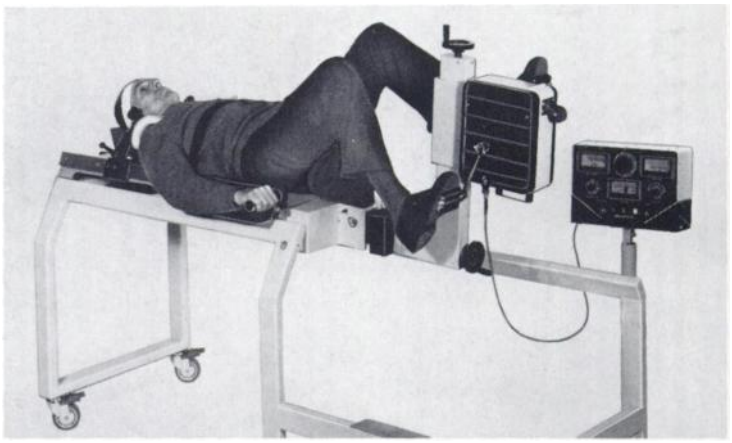

Left: Erect stress test in progress. Note that pedal unit has been lowered to eliminate contact with patient's knees when camera head is positioned.

Above: Supine stress test in progress. Far side of table is unobstructed to easily accommodate a gamma camera. Adjustment wheels control vertical and horizontal travel of pedal unit for patients of all sizes.

Cardiac Stress Table & Ergometer System

Permits all patient positions, from supine through upright, *plus* standard imaging procedures

VERSATILE • PRACTICAL • COST EFFECTIVE

Here is the most versatile stress imaging table available. It permits routine stress tests of patients in *any* position, from supine to upright. Whatever your nuclear cardiology requirements are, this exceptional system provides them quickly and easily...full gamma camera clearance, complete mobility, vibration-free rigidity, positive (but comfortable) patient restraint, easy-to-make positioning adjustments, unobstructed access to the patient and controls, choice of Collins or Quinton ergometers, and much more. The unit also doubles as a standard imaging table.

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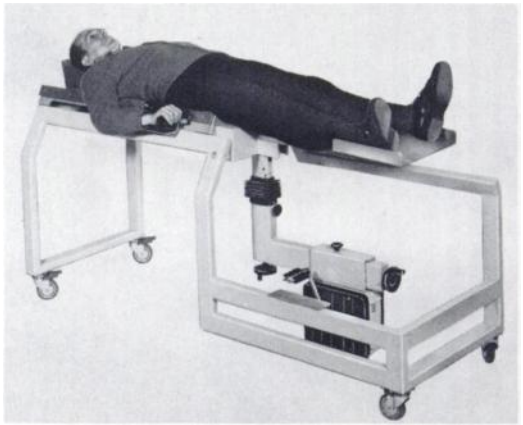

Patient positioned for standard imaging. Legs and feet are supported comfortably.

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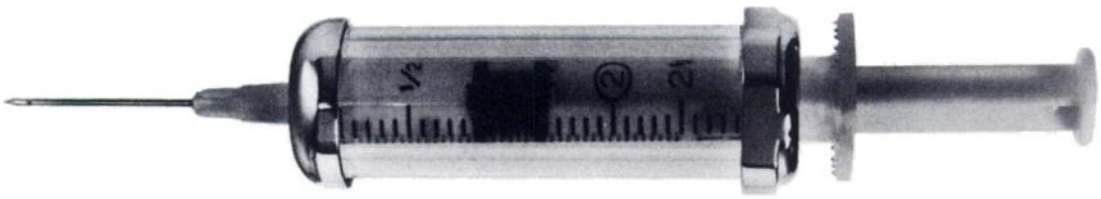

3cc syringe and shield shown actual size.

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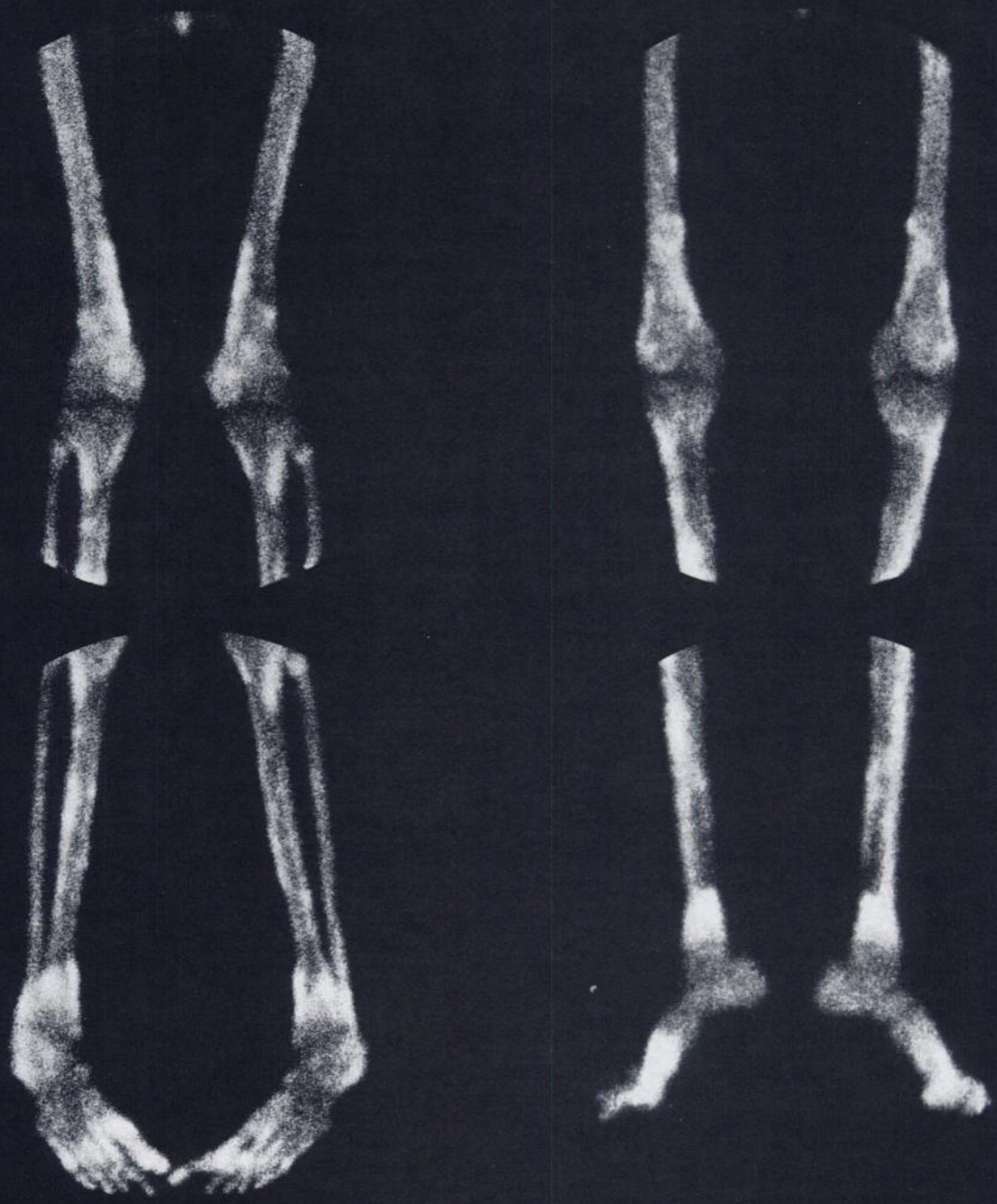
For information contact: Nuclear Pacific, Inc., 6701 Sixth Avenue So., Seattle, WA. 98108 (206) 763-2170.

Bone



Diagnosis: hypertrophic pulmonary osteoarthropathy

Imaging information: *Instrument:* GE MaxiCamera™ 535 *Dose:* 20 mCi OSTEOLITE
Scan time: 2.5-3.0 hours postinjection *Acquisition time:* 6 minutes/view

OSTEOLITE™

Technetium Tc 99m Medronate Sodium Kit (MDP)

NEN New England Nuclear®

Please see following page for brief prescribing information.

OSTEOLITE™
Technetium Tc 99m Medronate Sodium Kit (MDP)

INDICATIONS AND USAGE: Technetium Tc 99m OSTEOLITE may be used as a bone imaging agent to delineate areas of altered osteogenesis.

CONTRAINDICATIONS: None known.

WARNINGS: The contents of the OSTEOLITE vial are intended only for use in the preparation of Technetium Tc 99m medronate sodium and are NOT to be directly administered to the patient.

Ideally, examinations using radiopharmaceuticals – especially those elective in nature – of women of childbearing capability should be performed during the first ten days following the onset of menses.

PRECAUTIONS: A thorough knowledge of the normal distribution of intravenously administered Technetium Tc 99m medronate sodium is essential in order to accurately interpret pathologic studies.

Technetium Tc 99m medronate sodium, as well as any radioactive agent, must be handled with care. Once sodium pertechnetate Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to clinical personnel. Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

Since 50–75% of the administered dose is renally excreted, good patient hydration and frequent voiding for 4–6 hours post-injection will significantly reduce the bladder wall dose.

The Technetium Tc 99m labeling reaction involved in preparing Technetium Tc 99m medronate sodium depends on the maintenance of tin in the divalent state. Any oxidant present in the sodium pertechnetate Tc 99m employed may adversely affect the quality of the prepared agent. Thus, sodium pertechnetate Tc 99m containing oxidants should not be used without first demonstrating that it is without adverse effect on the properties of the resulting agent.

The use of bacteriostatic sodium chloride as a diluent for sodium pertechnetate Tc 99m may adversely affect the biologic distribution of the prepared agent, and its use is not recommended.

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m medronate sodium should be used in pregnant women only when clearly needed.

It is not known whether this drug is excreted in human milk. As a general rule nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: None reported.

DOSAGE AND ADMINISTRATION: The recommended dose for the average 70kg adult patient is 15mCi with a range of 10-20mCi. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

Optimal imaging results are obtained within one to four hours after administration.

OSTEOLITE should be used within six hours after aseptic reconstitution with sodium pertechnetate Tc 99m. For optimum results this time should be minimized.

The vial contains no bacteriostat.

Radiopharmaceuticals should be used by persons who are qualified by specific training in the safe use and handling of radionuclides produced by nuclear reactor or particle accelerator and whose experience and training have been approved by the appropriate governmental agencies authorized to license the use of radionuclides.

HOW SUPPLIED: NEN's OSTEOLITE™ Technetium Tc 99m Medronate Sodium Kit is supplied as a set of five or thirty vials, sterile and non-pyrogenic. Each nitrogen-flushed vial contains in lyophilized form:

Medronate Disodium – 10mg
Stannous Chloride Dihydrate – 0.85mg

The pH is adjusted to between 7.0-7.5 with hydrochloric acid and/or sodium hydroxide solution. The contents of the vial were lyophilized under nitrogen. Store at room temperature (15°-30° C). Included in each five (5) vial kit is one (1) package insert and six (6) radiation labels. Included in each thirty (30) vial kit is one (1) package insert and thirty-six (36) radiation labels.

The contents of the kit vials are not radioactive; however, **after reconstitution with sodium pertechnetate Tc 99m the contents are radioactive and adequate shielding and handling precautions must be maintained.**

Do not use if there is a vacuum in the immediate drug container or if air is injected into the container when the dose is withdrawn.

Catalog Number NRP-420 (5 vial kit) April 1978
Catalog Number NRP-420C (30 vial kit)

GLUCOSCAN™
Technetium Tc 99m Gluceptate Sodium Kit

INDICATIONS AND USAGE: Technetium Tc 99m Gluceptate Sodium is used for brain imaging.

Technetium Tc 99m Gluceptate Sodium is indicated for renal perfusion imaging as an adjunct in the diagnosis, localization and evaluation of kidney disease. It may provide useful information about renal size, shape, and position and may delineate lesions affecting renal blood flow.

CONTRAINDICATIONS: None known.

WARNINGS: The contents of the GLUCOSCAN vial are intended only for use in the preparation of Technetium Tc 99m Gluceptate Sodium and are NOT to be directly administered to the patient.

Ideally examinations using radiopharmaceuticals – especially those elective in nature – of a woman of childbearing capability should be performed during the first ten days following the onset of the menses.

Dehydration and/or patient positioning may result in failure to visualize urinary excretory structures in the presence of normal function. Adequate patient fluid intake and repositioning may reduce the incidence of such false positive studies.

PRECAUTIONS: Technetium Tc 99m Gluceptate Sodium, as well as any radioactive agent, must be handled with care. Once sodium pertechnetate Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to clinical personnel.

Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

The Technetium Tc 99m labeling reaction involved in preparing Technetium Tc 99m Gluceptate Sodium depends on the maintenance of tin in the divalent state. Any oxidant present in the sodium pertechnetate Tc 99m employed may adversely affect the quality of the prepared agent. Thus, sodium pertechnetate Tc 99m containing oxidants should not be used without first demonstrating that it is without adverse effect on the properties of the resulting agent.

The use of bacteriostatic sodium chloride as a diluent for sodium pertechnetate Tc 99m may adversely affect the biologic distribution of the prepared agent, and its use is not recommended.

No long term animal studies have been performed to evaluate carcinogenic potential.

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m Gluceptate Sodium should be used in pregnant women only when clearly needed.

It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: Although infrequent, erythema has been reported in association with the use of Technetium Tc 99m Gluceptate Sodium.

DOSAGE AND ADMINISTRATION: The recommended dose for the average (70kg) adult patient is 10-20 millicuries for both renal and brain imaging. Technetium Tc 99m Gluceptate Sodium is intended for intravenous administration only.

Technetium Tc 99m Gluceptate Sodium should be used within six hours after aseptic reconstitution with sodium pertechnetate Tc 99m. For optimal results, this time should be minimized. The reaction vial contains no bacteriostat.

Optimal results for both renal and brain imaging are obtained one hour after administration. Studies have shown that although optimal target-to-background ratios for brain lesions are obtained at two hours post-injection, there is no improvement in diagnostic efficacy after one hour.

Radiopharmaceuticals should be used by persons with specific training in the safe use and handling of radionuclides produced by nuclear reactor or particle accelerator and whose experience and training have been approved by the appropriate governmental agencies authorized to license the use of radionuclides.

The components of the New England Nuclear GLUCOSCAN Kit are supplied sterile and non-pyrogenic. Aseptic procedures normally employed in making additions and withdrawals from sterile, non-pyrogenic containers should be used during addition of pertechnetate solution and the withdrawal of doses for patient administration.

HOW SUPPLIED: NEN's GLUCOSCAN Technetium Tc 99m Gluceptate Sodium Kit is supplied as a set of five or thirty vials, sterile and non-pyrogenic. Each vial contains in lyophilized form:

Gluceptate Sodium – 200mg
Maximum Tin – 0.07mg
Stannous Chloride (min.) – 0.06mg

Prior to lyophilization the pH is adjusted with hydrochloric acid and/or sodium hydroxide solution. Store at room temperature (15°-30°C). Included in each five vial kit is one package insert and six radiation labels. Included in each thirty vial kit is one package insert and thirty-six radiation labels.

The contents of the kit vials are not radioactive; however, after reconstitution with sodium pertechnetate Tc 99m the contents are radioactive and adequate shielding and handling precautions must be maintained.

This reagent kit is approved for use by persons licensed by the U.S. Nuclear Regulatory Commission pursuant to Section 35.14 and 35.100 Group III of 10 CFR or under equivalent licenses of Agreement States.

Catalog Number NRP-180 (5 vial kit) August 1978
Catalog Number NRP-180C (30 vial kit)

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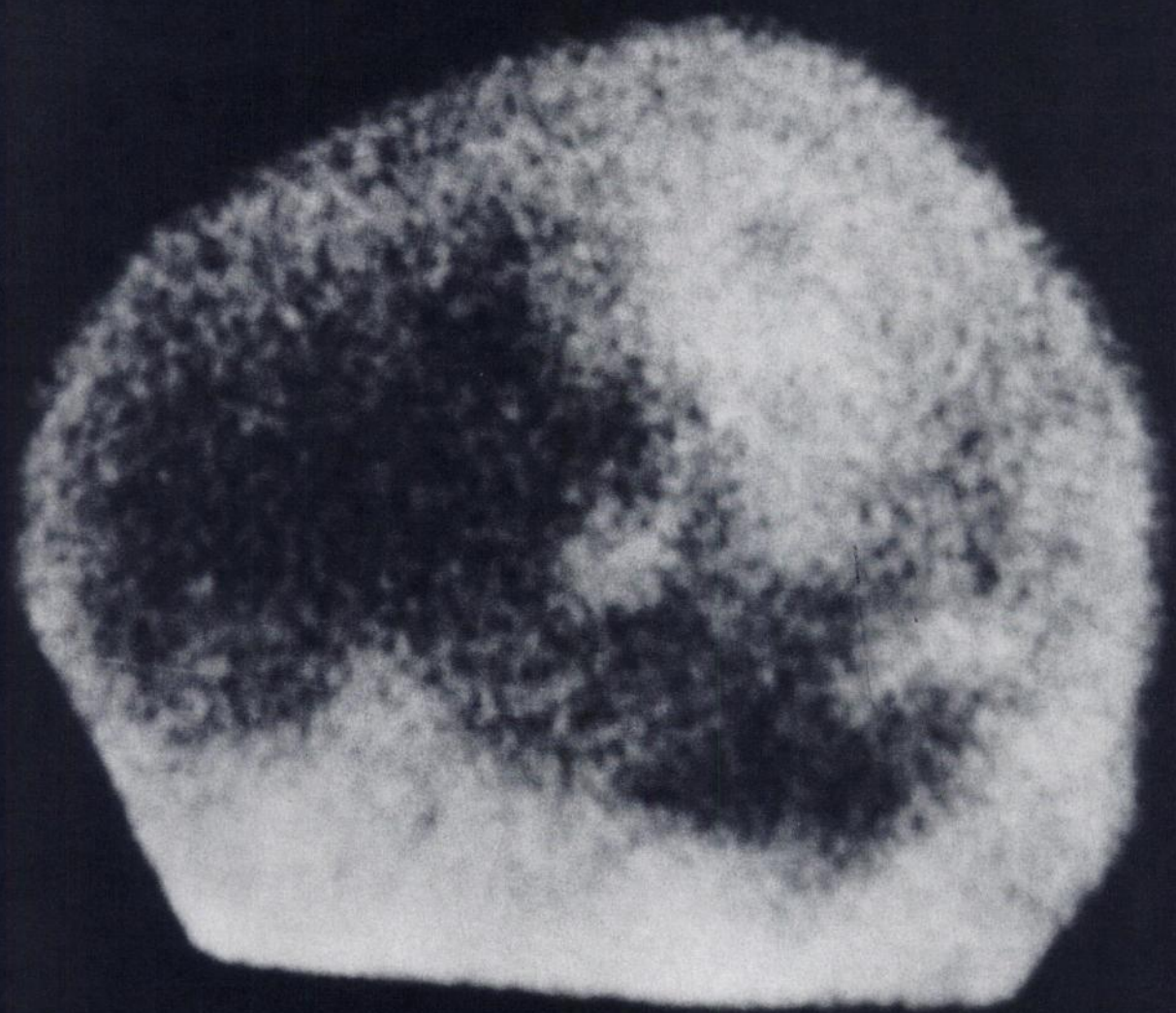
Brain



Diagnosis: arteriovenous malformation

Imaging information: *Instrument:* Ohio Nuclear Series 100 Gamma Camera *Dose:* 15 mCi GLUCOSCAN
Scan time: 90 minutes postinjection *Counts:* 400 K

GLUCOSCAN™

Technetium Tc 99m Gluceptate Sodium Kit

NEN New England Nuclear®

Please see preceding page for brief prescribing information.

Xenon Xe 133 Gas

(CALIDOSE™) Dispensing System

INDICATIONS: Inhalation of xenon Xe 133 gas has proved valuable for the evaluation of pulmonary function and for imaging the lungs. It may also be applied to assessment of cerebral flow.

CONTRAINDICATIONS: To date, no known contraindications to the use of xenon Xe 133 gas have been reported.

WARNINGS: This radiopharmaceutical should not be administered to pregnant or lactating women unless the benefits to be gained outweigh the potential hazards.

Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of the menses.

Radiopharmaceuticals should be used only by physicians who are qualified by specific training in the safe use and handling of radionuclides produced by nuclear reactor or particle accelerator, and whose experience and training have been approved by the appropriate governmental agency authorized to license the use of radionuclides.

PRECAUTIONS: As in the use of any other radioactive material care should be taken to insure minimum radiation exposure to the patient, consistent with proper patient management, and to insure minimum radiation exposure to occupational workers. Expired xenon Xe 133 gas should be controlled in a manner that is in compliance with the appropriate governmental agency regulations.

Xenon Xe 133 adheres to some plastics and rubber and should not be allowed to stand in tubing or respirator containers. Such unrecognized loss of radioactivity from the dose for administration may render the study nondiagnostic. Xenon Xe 133 gas delivery systems, ie, respirators or spirometers, and associated tubing assemblies must be leakproof to avoid loss of radioactivity into the laboratory environs not specifically protected by exhaust systems.

ADVERSE REACTIONS: To date, no adverse reactions based on the use of xenon Xe 133 gas have been reported.

DOSAGE AND ADMINISTRATION: Xenon Xe 133 gas is administered by inhalation from closed respirator systems or spirometers.

The suggested activity range employed for inhalation by the average adult patient (70kg) is:

Pulmonary function including imaging: 2-30 mCi in 3 liters of air.

Cerebral blood flow: 10-30 mCi in 3 liters of air.

The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

HOW SUPPLIED: The xenon Xe 133 gas is supplied as part of the Calidose* system, consisting of 2 ml unit dose vials and the Calidose dispenser* for shielded dispensing.

Normally vials containing either 10 or 20 mCi/vial, packed up to 5 vials per shield tube, are supplied. Vial sets containing up to 100 mCi/vial are available.

Catalog Number NRP-127 *Patent Pending †JO 127 July 1975, Rev 1

PULMOLITE™

Technetium Tc 99m Aggregated Albumin Kit

INDICATIONS AND USAGE: Technetium Tc 99m aggregated albumin is indicated as a lung imaging agent to be used as an adjunct in the evaluation of pulmonary perfusion.

CONTRAINDICATIONS: Technetium Tc 99m aggregated albumin should not be administered to patients with severe pulmonary hypertension.

The use of Tc 99m aggregated albumin is contraindicated in persons with a history of hypersensitivity reactions to products containing human serum albumin.

WARNINGS: The possibility of allergic reactions should be considered in patients who receive multiple doses.

Theoretically, the intravenous administration of particulate material such as aggregated albumin imposes a temporary small mechanical impediment to blood flow. While this effect is probably physiologically insignificant in most patients the administration of aggregated albumin is possibly hazardous in acute cor pulmonale and other states of severely impaired pulmonary blood flow.

This radiopharmaceutical preparation should not be administered to children or to pregnant or lactating women unless the expected benefits to be gained outweigh the potential risks.

Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

PRECAUTIONS: In cases of right-to-left cardiac shunt, additional risk may exist due to the rapid entry of aggregated albumin into the systemic circulation.

The contents of the kit are not radioactive. However, after the sodium pertechnetate Tc 99m is added, adequate shielding of the final preparation must be maintained.

The labeling reactions involved in preparing the agent depend on maintaining tin in the reduced state. Any oxidant present in the sodium pertechnetate Tc 99m supply may thus adversely affect the quality of the prepared agent. Hence, sodium pertechnetate Tc 99m containing oxidants, or other additives, should not be employed without first demonstrating that it is without adverse effect on the properties of the resulting agent.

The contents of the vial are sterile and non-pyrogenic. It is essential that the user follow the directions carefully and adhere to strict aseptic procedures during preparation of the radiodiagnostic.

Technetium Tc 99m aggregated albumin is physically unstable and as such the particles will settle with time. Failure to mix the vial contents adequately before use may result in non-uniform distribution of radioactivity.

It is also recommended that, because of the increasing probability of agglomeration with aging, a batch of Technetium Tc 99m aggregated albumin not be used after eight hours from the time of reconstitution. Refrigerate at 2 to 8 C after reconstitution. If blood is withdrawn into the syringe, unnecessary delay prior to injection may result in clot formation in situ.

The contents of the vial are under a nitrogen atmosphere and should be protected from air. Do not use if clumping or foaming of the contents is observed.

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m aggregated albumin should be used in pregnant women only when clearly needed.

It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken while a patient is on a drug since many drugs are excreted in human milk.

Safety and effectiveness in children have not been established.

As in the use of any radioactive material, care should be taken to minimize radiation exposure to the patient, consistent with proper management, and to insure minimum radiation exposure to the occupational worker.

Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the safe use and handling of radionuclides and whose experience and training have been approved by the appropriate governmental agency authorized to license the use of radionuclides.

ADVERSE REACTIONS: The literature contains reports of deaths occurring after the administration of aggregated albumin to patients with pre-existing severe pulmonary hypertension. Instances of hemodynamic or idiosyncratic reactions to preparations of Tc 99m-labeled aggregated albumin have been reported.

Hypersensitivity reactions are possible whenever protein-containing materials such as Tc 99m-labeled aggregated albumin are used in man. Epinephrine, antihistamines and corticosteroid agents should be available for use.

DOSAGE AND ADMINISTRATION: The recommended intravenous dose range for the average patient (70kg) is 1 to 4 millicuries. The volume of the dose may vary from 0.2 to 1.3 ml.

The recommended number of aggregated albumin particles to be administered per dose is 200,000-700,000 with the suggested number being approximately 350,000.

For easy and accuracy in dispensing the prepared agent, it is recommended that prior to reconstitution, concentrated sodium pertechnetate Tc 99m be further diluted to a volume of 8ml with fresh, preservative-free sodium chloride injection (U.S.P.).

HOW SUPPLIED: PULMOLITE™ Technetium Tc 99m Aggregated Albumin Kit is supplied in kits of five (5) or thirty (30) vials, sterile and non-pyrogenic, each vial containing in lyophilized form:

Aggregated albumin (human)-1.0mg
Normal human serum albumin-10mg
Sodium chloride-10mg
Stannous chloride dihydrate, maximum-0.07mg

Each vial contains 3.6-6.5 x 10^6 aggregated albumin particles.

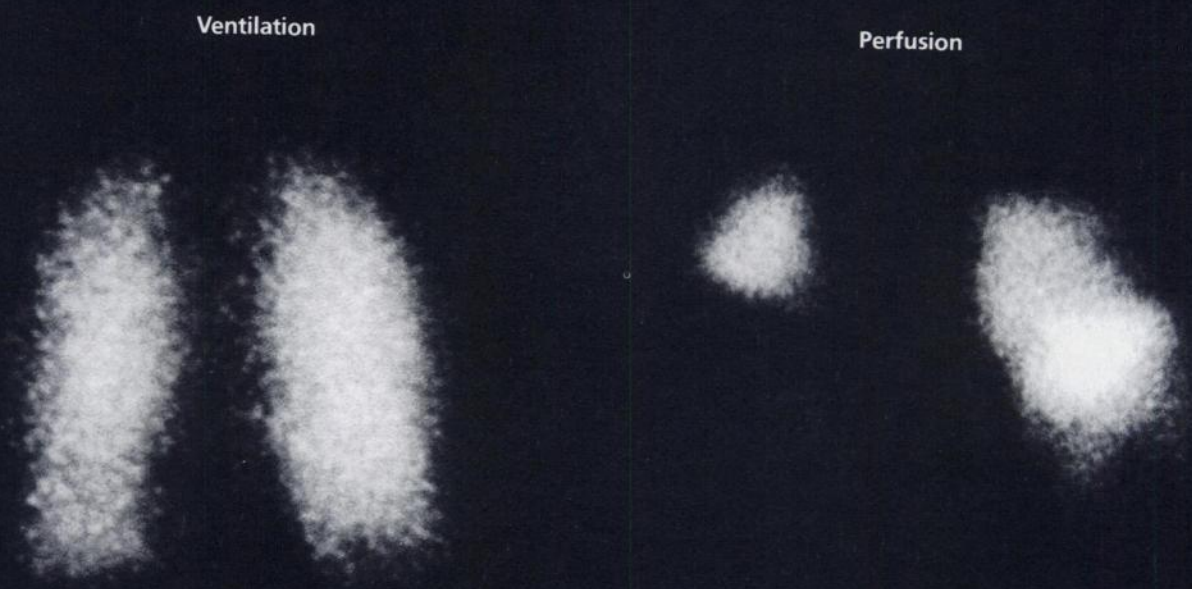
PULMOLITE contains no preservative; after reconstitution the shielded vial should be stored at 2° to 8°C.

Included in each five (5) vial kit is one (1) package insert and six (6) radiation labels. Included in each thirty (30) vial kit is one (1) package insert and thirty-six (36) radiation labels.

This reagent kit is approved for use by persons licensed by the U.S. Nuclear Regulatory Commission pursuant to Section 35.14 and 35.100 Group III of 10CFR 35 or under licenses of Agreement States.

Catalog Number NRP-415 **August 1976**

Lung



Diagnosis: normal ventilation, abnormal perfusion — pulmonary embolism

Imaging information: *Instrument:* Picker Model 4/15 Gamma Camera *Dose:* 15 mCi Xenon 133; 3 mCi PULMOLITE *Information density:* 1,000 counts/cm²; 2,000 counts /cm²

Xenon Xe 133 Gas
(CALIDOSE™) Dispensing System

PULMOLITE™
Technetium Tc 99m Aggregated Albumin Kit

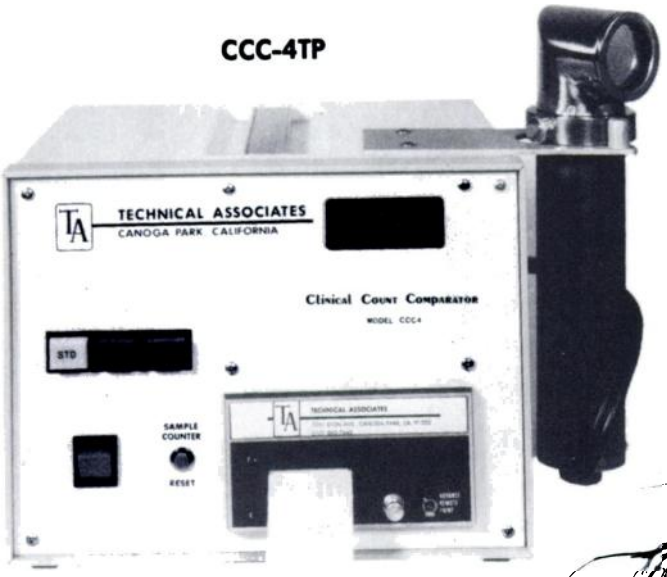
NEN New England Nuclear®

Please see preceding page for brief prescribing information.

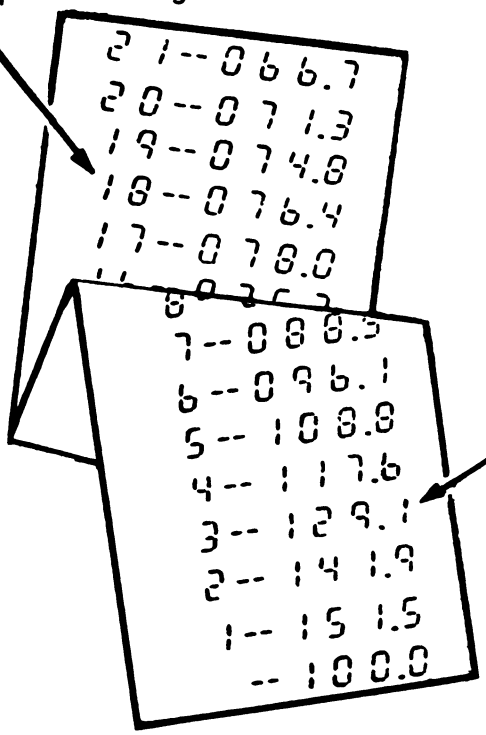
thrombosis

detection of DVT using I-125 fibrinogen

CCC-4TP



position on leg



percent uptake

Print Out
1¾ inch wide

- Direct **digital percent** readout
- Printout **saves time**
- Bedside operation
- Right angle probe minimizes patient disturbance
- Controls are on probe
- Operator **error protection**
- Versatile — settable for other isotopes

TECHNICAL ASSOCIATES

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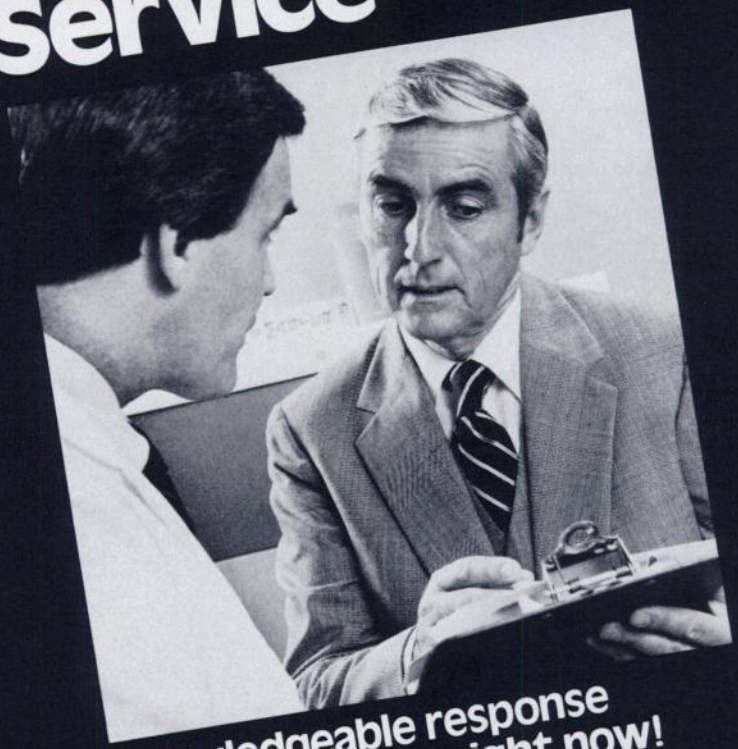
Personal Service



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to Nuclear Medicine

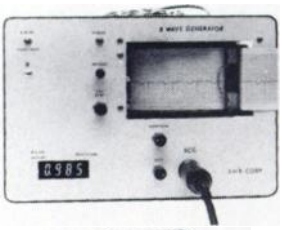
MALLINCKRODT, INC., Post Office Box 5840, St. Louis, MO 63134

AMR Presents

AccuSync

The finest R-wave Triggering device available for computerized gated cardiac studies.

FEATURES	BENEFITS
• Exclusive **Double Discrimination** provides precise definition of R-wave.	• Computer is gated only on the R-wave. High amplitude T-waves are ignored.
• ECG Strip Chart Recorder	• Provides permanent record of patient ECG. Insures proper lead placement.
• Four digit LED Display	• Indicates R-R Interval or Heart Rate during stress studies.
• Trigger Pulse LED	• Monitors presence of output signals to the computer.
• Unlimited Heart Rate Capability	• Both Heart Rate display and R-trigger pulses have unlimited tracking capability during stress studies.
• ONE YEAR WARRANTY	• ONE YEAR WARRANTY

MODEL	FEATURES	
AccuSync-I	R-Trigger pulse output, ECG output, Heart Rate/R-R int. display, Strip Chart Recorder and Isolation Amplifier for patient safety.	
AccuSync-II	All above features incorporated into a Module designed to fit into certain Mobile cameras.	
AccuSync-III	All **AccuSync-I** features with the exception of the Strip Chart Recorder.	
AccuSync-IV	All **AccuSync-III** features with the exception of the Heart Rate R-R int. display.	

Advanced Medical Research Corp./P.O. Box 3094 PPS/301 Brewster Road
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KEEP YOUR HANDS OFF OUR CAMERA

...with the compact Autoloader you can.

The Autoloader is the latest result of our continuing efforts to produce multiple image video cameras that do everything medical imaging cameras should do. . . automatically.

Matrix continually refines and upgrades the Video Imager Series — the only multiple image video cameras that automatically adjust exposure before each image is photographed. Convenience, economy and, most of all, excellent image quality have made the Video Imager the most popular camera system on the market, with 1500 new installations a year.

Now, recognizing the growing need for a system that eliminates manual film handling, we've developed the Autoloader option for the Video Imager.

We know that film handling can be a hassle, particularly in applications where the caseload or the imaging requirements per patient are large. Or in ultrasound applications, where operators must interrupt the procedure and put aside controls and transducers to change film.

In any application, dealing with manually loaded individual film cassettes wastes valuable time, especially in institutions where heavy demand produces a bottleneck at the darkroom. Individual cassettes can also waste film and multiply the chances for error through confusing exposed and unexposed film.

With Autoloader, you bulk load 50 sheets of film into a compact, removeable supply magazine. Then expose as many sheets as needed — Autoloader stores exposed film in a take-up magazine and places an unexposed film in the Video Imager automatically. The take-up magazine can be removed at any time and taken to the darkroom for processing.

Bulk film loading and automatic operation make the Video Imager the most convenient camera system available. A wide range of image formats and sizes give it flexibility to meet all your imaging needs in ultrasound, CT, nuclear medicine computer, and video fluoroscopy procedures. And flat-faced, 1400-line resolution, high-linearity video monitors, superior optics and precise microprocessor control enable the Video Imager to produce the finest quality images, from which you can diagnose confidently.

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For more information, call us at (201) 767-1750, or toll-free, (800) 526-0274, or write Matrix Instruments, 230 Pegasus Avenue, Northvale, New Jersey 07647. Telex: 135131

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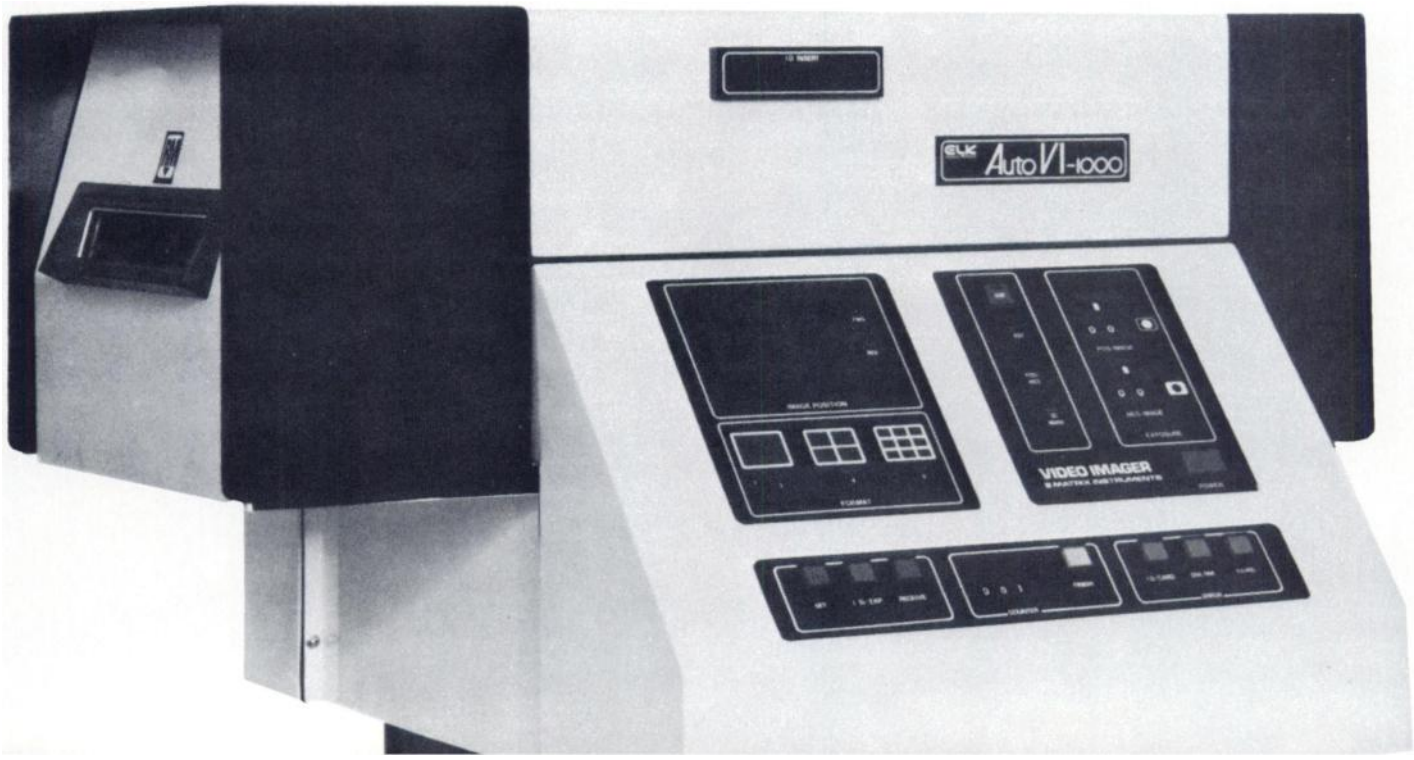
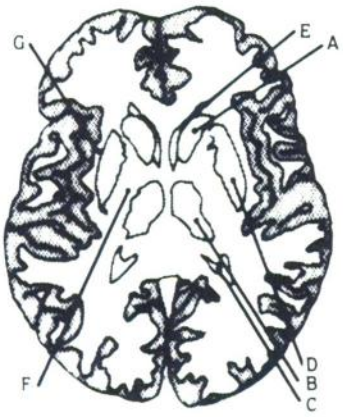


The ECAT®-II scanner of image quality in

Positron-emission tomographic image of glucose utilization in the normal human brain, made with an ECAT-II Scanner.

Phelps et al. 1979. Tomographic measurement of local cerebral glucose metabolic rate in humans with (F-18)2-fluoro-2-deoxy-D-glucose: Validation of method. Ann. Neurol. 6: 371-388.



A = caudate nucleus
B = thalamic nuclei
C = atrium of lateral ventricle
D = putamen and globus pallidus
E = anterior horn of lateral ventricle
F = internal capsule
G = external capsule

ECAT-II image

has set the standard positron tomography.

The Neuro-ECAT will set a higher one.

Pictures speak louder than words.

Take a close look at the ECAT® image. Increasing tissue activity is represented by darker shades of gray. Note the clear delineation of superficial cortex, subcortical white matter, and internal gray nuclei. No other system has produced images of hemodynamic or metabolic function that even come close for quantitative interpretation. And ECAT systems have been operational for over 3 years.

ECATs are complete analytical instruments designed to free the researcher from equipment limitations.

The basic ECAT system includes the scanning gantry and patient couch, a PDP-11/60* computer, displays, data acquisition and storage systems and a comprehensive software package. The ECAT scanner system is technician oriented and has been proven accurate and reliable in installations throughout the world. Special programs featuring multi-compartment physiological models have been made available by our Users' Group for quantitative image interpretation.

Now, the new Neuro-ECAT images come even closer to a slice of life.

This system, designed for the human head, delivers the highest quality images ever obtained from a positron tomographic scanner. Five at a time in its highest efficiency mode. It is also the system of choice for whole body studies of small children and animals, and gated imaging makes the Neuro-ECAT a superb instrument for cardiac studies in these cases. The Neuro-ECAT incorporates all of the operational flexibility of the ECAT-II and more. New technology includes octagonal arrays of bismuth germanate detectors, with movable septa and shadow shields to refine resolution and significantly reduce scatter and random counts. The septa

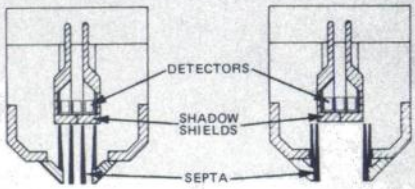


Figure 1

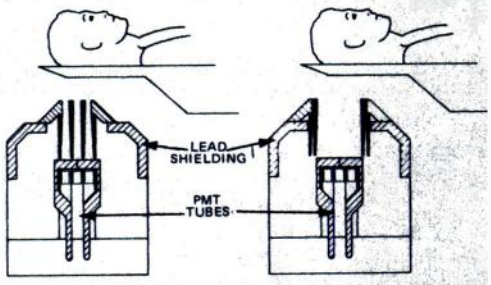


Figure 2

are shown in Figure 1 positioned for highest quantification, and in Figure 2 for maximum efficiency.

The Neuro-ECAT is the next generation in positron tomographic scanners. Versatile. Reliable. With outstanding quantitative capability, data management, and post-collection data processing. In fact, the Neuro-ECAT is the first scanner of its kind you could consider a true analytical instrument.

For more information, assistance, or a brochure describing the glucose utilization software, call or write: EG&G ORTEC, Life Sciences Division, 100 Midland Road, Oak Ridge, TN 37830, U.S.A. Telephone: (615) 482-4411.

*Registered trademark of the Digital Equipment Corporation.

EG&G ORTEC

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The Assayer 1 by Radx

The never ending struggle for product popularity often leads a manufacturer to add gadgets. It's called "one-upmanship." We sometimes lose sight of what YOU, the user, wants.

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The return to basics does not require a return to the 1960's technology. The Assayer 1 is microprocessor controlled, totally solid state, with a method of isotope selection way ahead of its time (an optical scanner) which is so precise, reproducible, and reliable that it will soon be copied.

It is not a gadget, it calibrates doses accurately, with precision and unprecedented reliability. It's the Assayer 1—$2950.

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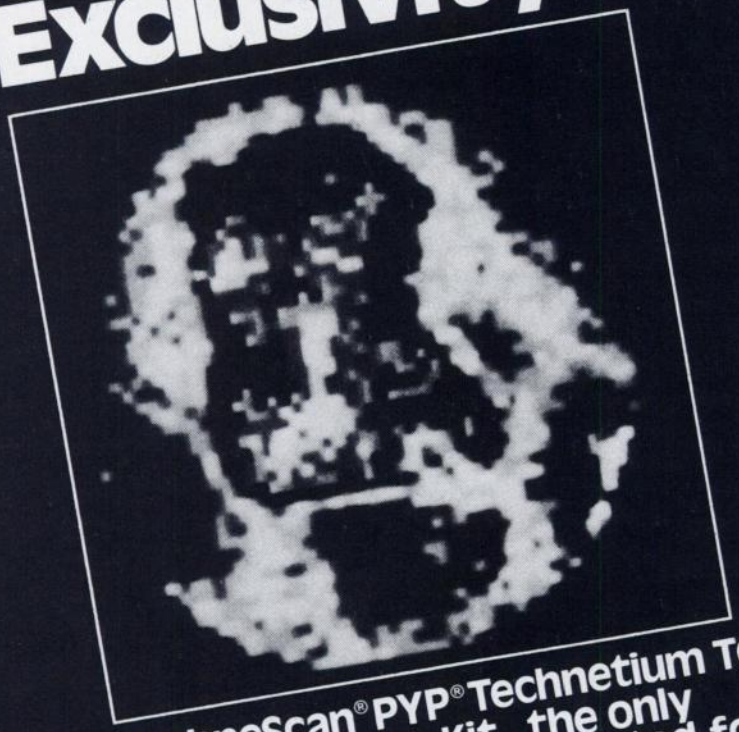

TechneScan® PYP® Technetium Tc99m Pyrophosphate Kit...the only pyrophosphate kit indicated for gated cardiac blood pool imaging.

Mallinckrodt's TechneScan PYP is the only pyrophosphate kit available that gives you the additional diagnostic capability of an advanced method for the dynamic assessment of cardiac function.

Other indications in nuclear cardiology include use as an adjunct in the diagnosis of acute myocardial infarction.

For more information about TechneScan PYP—and all the other organ-imaging kits available from Mallinckrodt—just call your Mallinckrodt representative or this toll-free number:

800-325-3688 (In Missouri, 314-895-0880 collect)
For technical assistance, it's 800-325-8181

See brief summary on following page.

THE MALLINCKRODT COMMITMENT

Mallinckrodt® Diagnostics

to Nuclear Medicine

MALLINCKRODT, INC., Post Office Box 5840, St. Louis, MO 63134

TechneScan® PYP®

Technetium Tc-99m Pyrophosphate Kit

BRIEF SUMMARY

CLINICAL PHARMACOLOGY

When injected intravenously **TechneScan PYP Tc 99m** has a specific affinity for areas of altered osteogenesis. It is also concentrated in the injured myocardium, primarily in areas of irreversibly damaged myocardial cells.

One to two hours after intravenous injection of **TechneScan PYP Tc 99m**, an estimated 40 to 50 percent of the injected dose has been taken up by the skeleton and approximately 0.01 to 0.02 percent per gram of acutely infarcted myocardium. Within a period of one hour, 10 to 11 percent remains in the vascular system, declining to approximately 2 to 3 percent twenty-four hours post injection. The average urinary excretion was observed to be about 40 percent of the administered dose after 24 hours.

TechneScan PYP also has an affinity for red blood cells. When administered 30 minutes prior to the intravenous administration of sodium pertechnetate Tc-99m approximately 76 percent of the injected activity remains in the blood pool providing excellent images of the cardiac chambers.

INDICATIONS AND USAGE

TechneScan PYP Tc 99m is a skeletal imaging agent used to demonstrate areas of altered osteogenesis, and a cardiac imaging agent used as an adjunct in the diagnosis of acute myocardial infarction.

As an adjunct in the diagnosis of confirmed myocardial infarction (ECG and serum enzymes positive), the incidence of false negative images has been found to be 6 percent. False negative images can also occur if made too early in the evolutionary phase of the infarct or too late in the resolution phase. In a limited study involving 22 patients in whom the ECG was positive and serum enzymes questionable or negative, but in whom the final diagnosis of acute myocardial infarction was made, the incidence of false negative images was 23 percent. The incidence of false positive images has been found to be 7 to 9 percent. False positive images have also been reported following coronary by-pass graft surgery, in unstable angina pectoris, old myocardial infarcts and in cardiac contusions.

TechneScan PYP is a blood pool imaging agent which may be used for gated cardiac blood pool imaging. When administered intravenously 30 minutes prior to the intravenous administration of sodium pertechnetate Tc-99m approximately 76 percent of the injected activity remains in the blood pool.

CONTRAINDICATIONS

None.

WARNINGS

This radiopharmaceutical should not be administered to patients who are pregnant or lactating unless the information to be gained outweighs the potential hazards.

Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

Warning: Preliminary reports indicate impairment of brain scans using pertechnetate Tc-99m which have been preceded by bone scan. The impairment may result in false positives or false negatives. It is recommended, where feasible, that brain scans precede bone imaging procedures.

Radiopharmaceuticals should be used only by physicians who are qualified by specific training in the safe use and handling of radionuclides produced by nuclear reactor or particle accelerator and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

The **TechneScan PYP Kit** must be maintained at refrigerator temperature until use.

The contents of the **TechneScan PYP** reaction vial are intended for use in the preparation of Technetium Tc 99m Stannous Pyrophosphate. **TechneScan PYP** may also be reconstituted with sterile, pyrogen-free normal saline containing no preservatives and injected intravenously prior to the administration of sodium pertechnetate Tc-99m.

Sodium pertechnetate Tc-99m solutions containing an oxidizing agent are not suitable for use with the **TechneScan PYP Kit**.

The contents of the kit are not radioactive. However, after the sodium pertechnetate Tc-99m is added, adequate shielding of the final preparation must be maintained.

TechneScan PYP Tc 99m should not be used more than six hours after preparation.

PRECAUTIONS

As in the use of any other radioactive material, care should be taken to insure minimum radiation exposure to the patient, consistent with proper patient management, and to insure minimum radiation exposure to occupational workers.

Bone Imaging

Both prior to and following **TechneScan PYP Tc 99m** administration, patients should be encouraged to drink fluids. Patients should void as often as possible after the **TechneScan PYP Tc 99m** injection to minimize background interference from accumulation in the bladder and unnecessary exposure to radiation.

Cardiac Imaging

Patient's cardiac condition should be stable before beginning the cardiac imaging procedure.

If not contraindicated by the cardiac status, patients should be encouraged to ingest fluids and to void frequently in order to reduce unnecessary radiation exposure.

Interference from chest wall lesions such as breast tumors and healing rib fractures can be minimized by employing the three recommended projections.

Blood Pool Imaging

TechneScan PYP should be injected by direct venipuncture. Heparinized catheter systems should be avoided.

ADVERSE REACTIONS

None.

HOW SUPPLIED

Catalog Number—*094* **TechneScan PYP Technetium Tc-99m Pyrophosphate Kit.**

Kit Contains:

5—Stannous Pyrophosphate Reaction Vials (lyophilized) for the preparation of Technetium Tc-99m Stannous Pyrophosphate.

Reaction Vial Contains:

12.0 mg sodium pyrophosphate and 3.4 mg stannous chloride (lyophilized). Hydrochloric acid is added for pH adjustment prior to lyophilization.

5—Radioassay Information String Tags.

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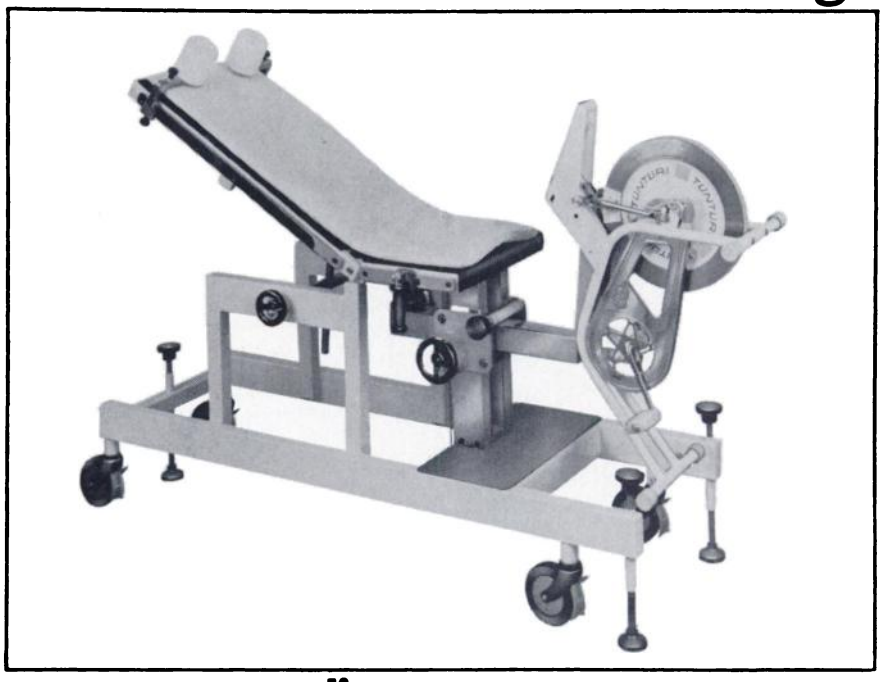

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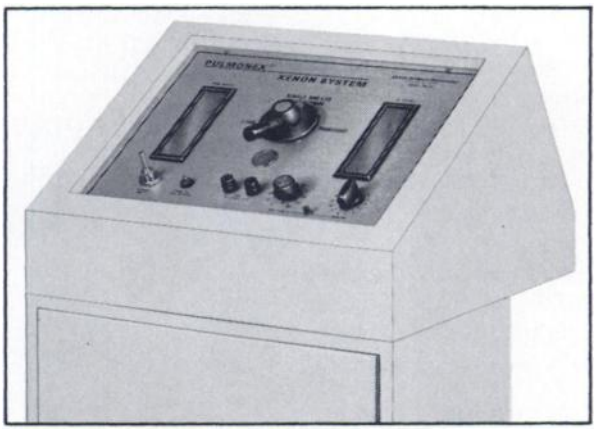

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"Industry demands and Harshaw scintillation crystal technology have had a symbiotic relationship since the detection industry began.

"For over four decades, we've grown together—Harshaw setting new industry standards, the industry challenging Harshaw to supply quality basics and design innovations that anticipate future demands.

"Functional new approaches like our Integral Line,® Matched Window® and Square Line assembly concepts revolutionized detection capabilities and efficiency.

"Our commitment to basics widened the scope of NaI(Tl) applications and performance when we developed Polyscin.® Hot-worked and shaped, these polycrystalline detectors overcame the limitations of single crystal geometries, providing improved resistance to thermal and mechanical shock without altering scintillation performance.

"Harshaw design breakthroughs have historically led to the industry growth that keeps the cycle of challenge in motion. Developments like our "MKS" square detectors maintained uranium exploration impetus when size and weight became crucial factors in aerial detection.

"And through the years, Harshaw and the people who rely on our crystal and electronics design leadership have built strong, mutually beneficial relationships of our own.

"Our customers know from long experience that Harshaw's multi-discipline approach to systems analysis means productive results. We're willing and able to find the right solutions to your scintillation detection problems—not just convenient approximations. Harshaw expertise means recommendations and design that give you the best detector for your specific application, whether the answer is an NaI scintillator from our comprehensive stock of standard detectors, or any of the full array of alternative scintillators available only from Harshaw.

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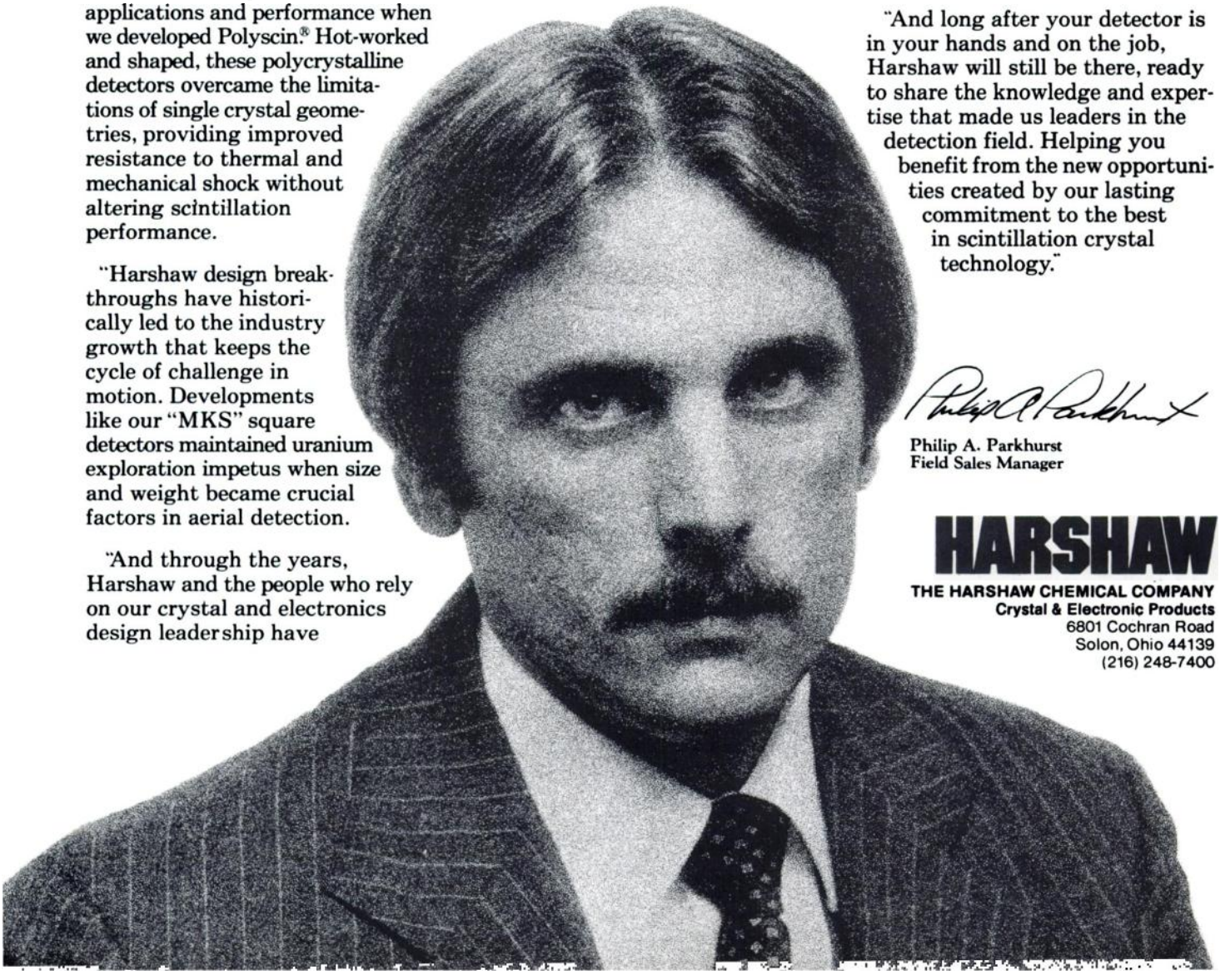
"And long after your detector is in your hands and on the job, Harshaw will still be there, ready to share the knowledge and expertise that made us leaders in the detection field. Helping you benefit from the new opportunities created by our lasting commitment to the best in scintillation crystal technology."



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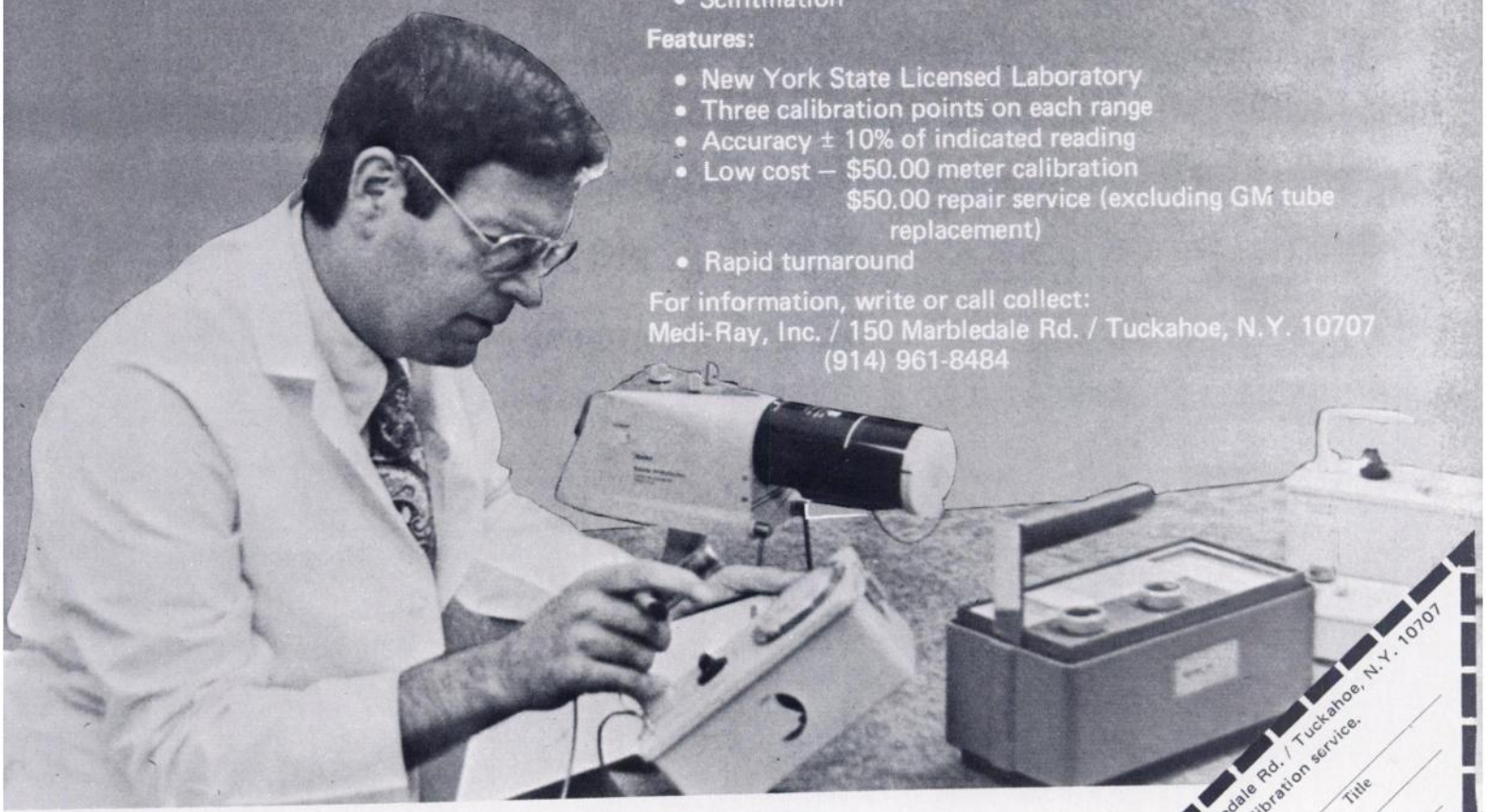

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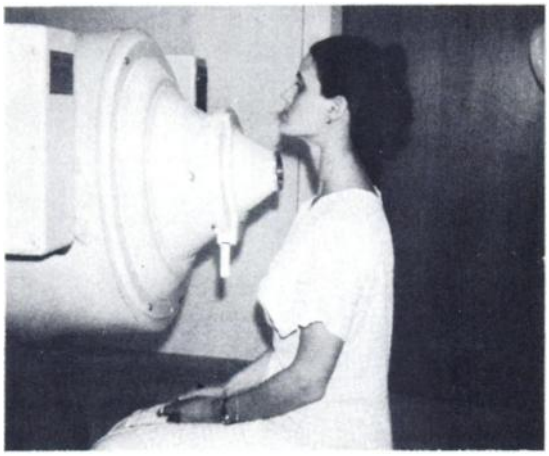

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Announcing a new Multi-Purpose collimator developed by NSI that converts from a pinhole to an uptake collimator with a simple change of attachments.

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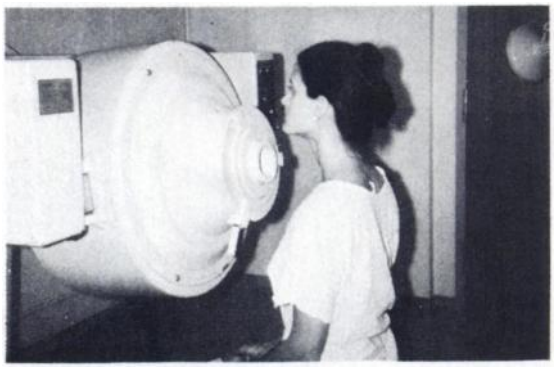

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- **Replace your obsolete rectilinear scanner used for thyroids with our dual purpose pinhole collimator and do your thyroid uptakes and imaging on your gamma camera**
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- **Available for most gamma cameras and compatible with both high and low energy isotopes**

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A chair for your Gamma Camera!

Now rapid, convenient positioning can be done on ambulatory patients for brain, lung or liver scans.

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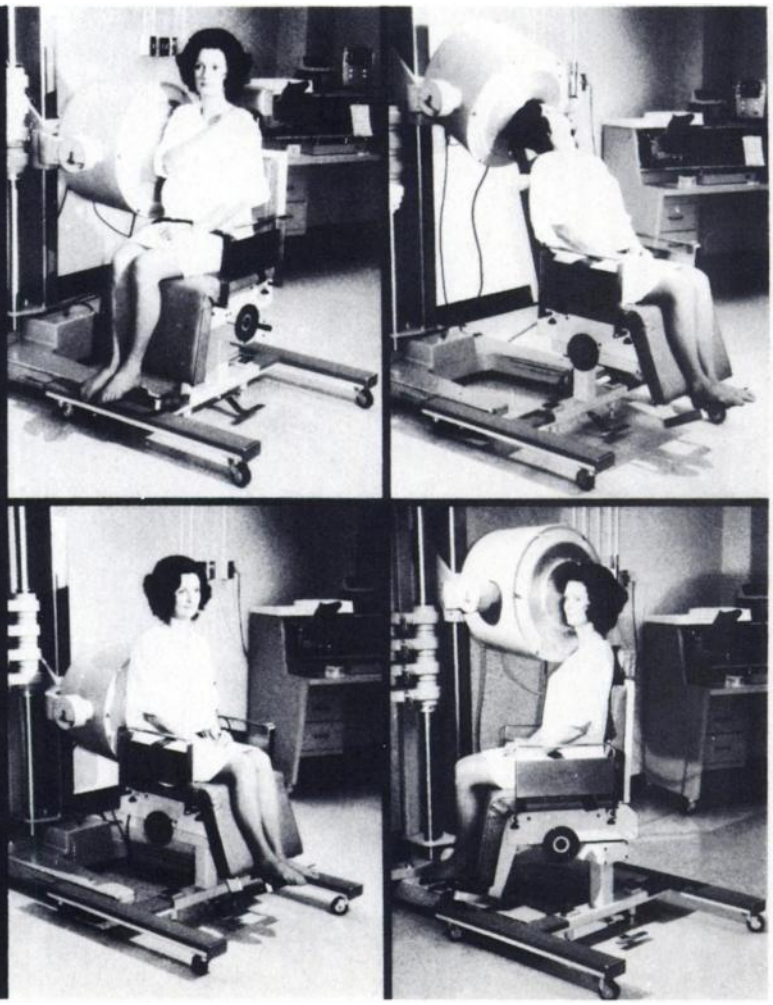
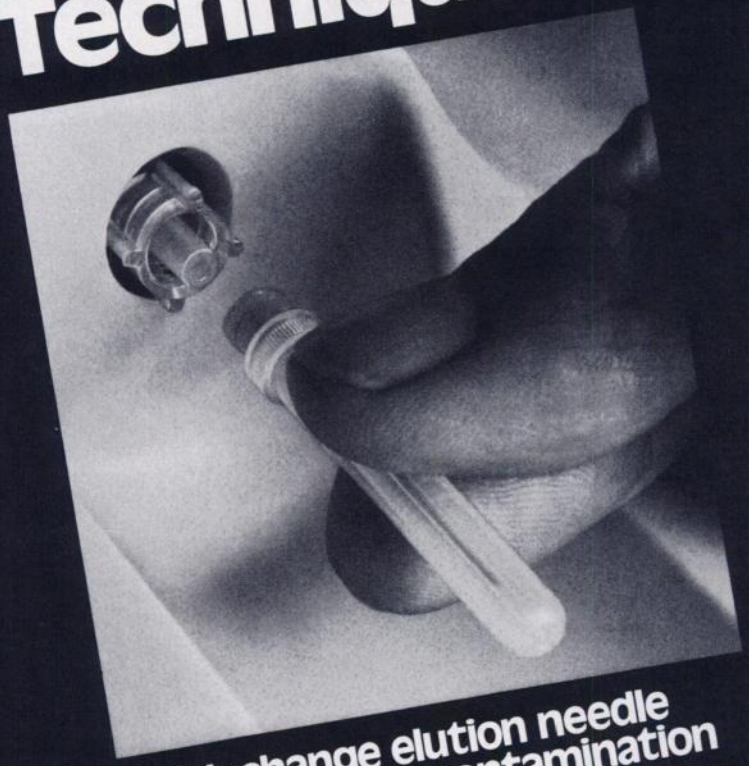


Sterile Technique



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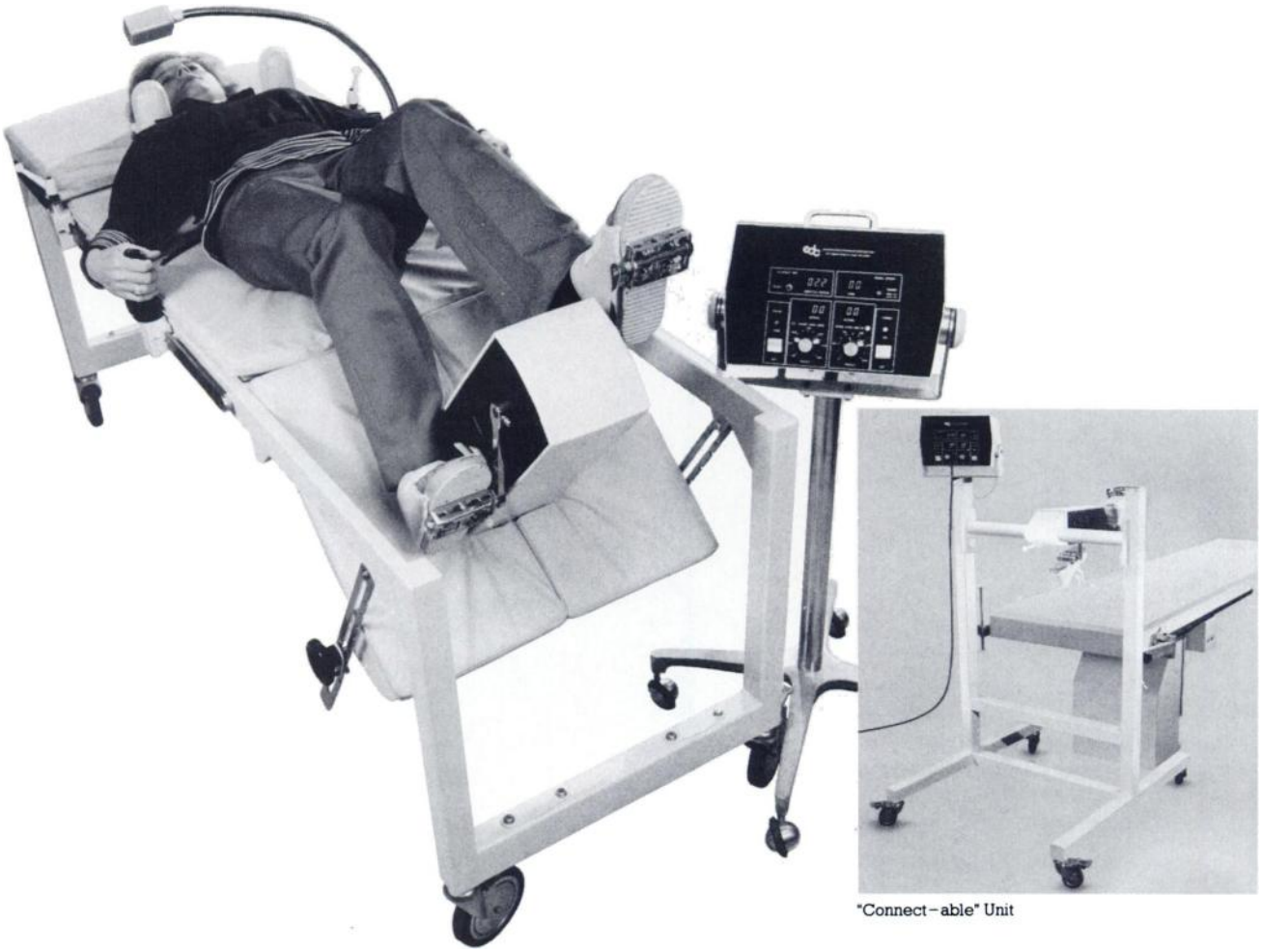

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A more relaxed, better-imaged patient. It adds up to better medicine.

The 8407 control console displays actual workload, pedal speed and elapsed time. Optional automatic heart-rate-control-of-workload enables the clinician to select the specific, individual heart rate at which cardiac stress imaging will be conducted.

The versatile table can be used for other nuclear imaging studies, radiology and ultrasound. Image from above or below table. Vary patient position – supine or sitting.

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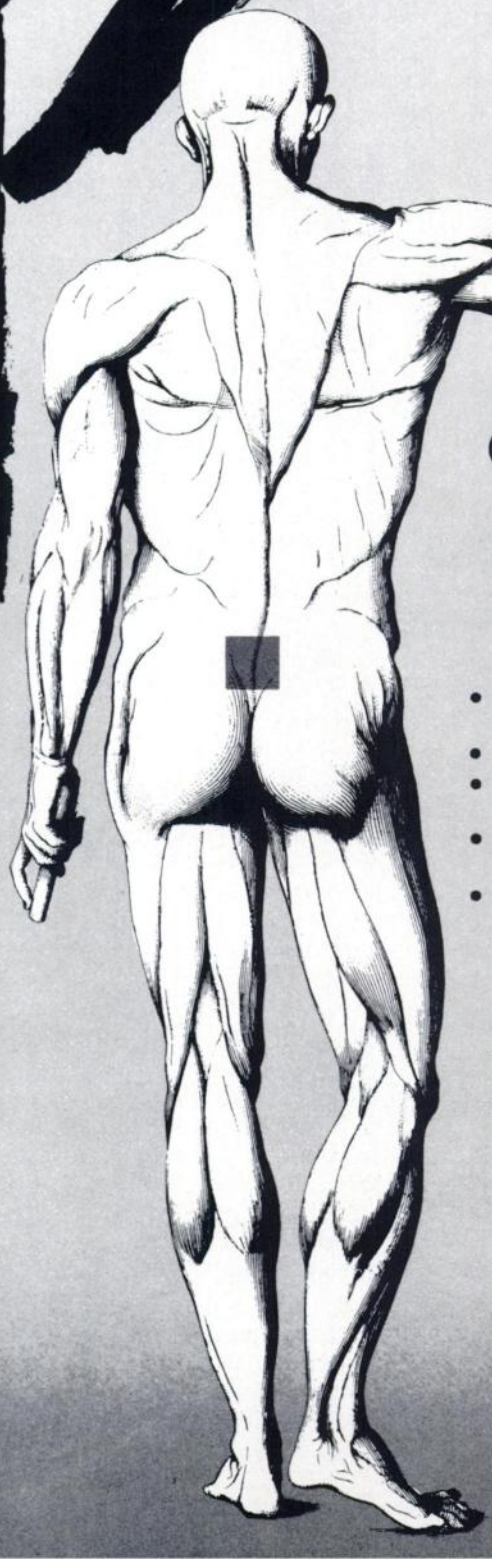

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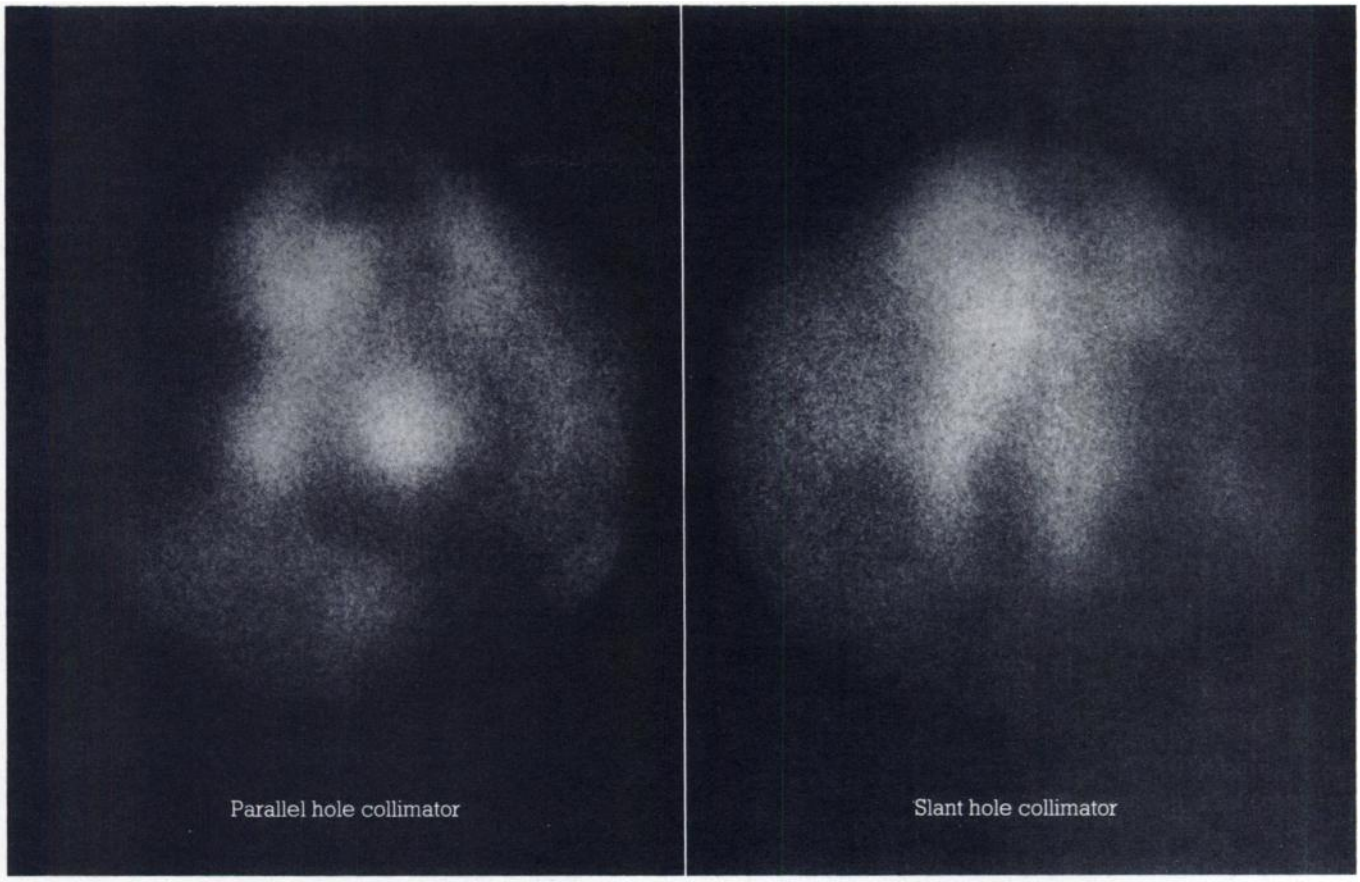

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During radionuclide ventriculography of the cardiac blood pool in the modified left anterior oblique (MLAO) view, EDC's slant hole collimator permits placement of the detector flat against the patient's chest because of the holes' 30° caudal angulation. The improved outcome, demonstrated by the above ungated cardiac images of a patient with aortic stenosis and left ventricular hypertrophy, includes:

- Complete resolution and separation of left ventricle and atrium.
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A study by Dr. J. Anthony Parker,* Harvard Medical School, found that radionuclide ventriculography with the EDC 30° slant hole collimator provides "an accurate measure of

ejection fraction at equilibrium and a qualitative assessment of regional changes in ventricular volume."

Refined resolution of the cardiac apex is obtained in the RAO view. Other applications of the slant hole collimator include imaging of the spleen and posterior cranial fossa.

The EDC slant hole can be mounted on any commercial Anger scintillation camera. Rotatability of the slant hole inserts facilitates correct positioning. Computed tomography is made possible via indexing of the collimator with detents at up to 24 angles.

Other collimators available from EDC: Seven Pinhole, Bifocal Diverging, Div/Con, Parallel Hole.

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*PARKER, J.A. et al: Radionuclide left ventriculography with the slant hole collimator. J Nucl Med 18:848-851, 1977.

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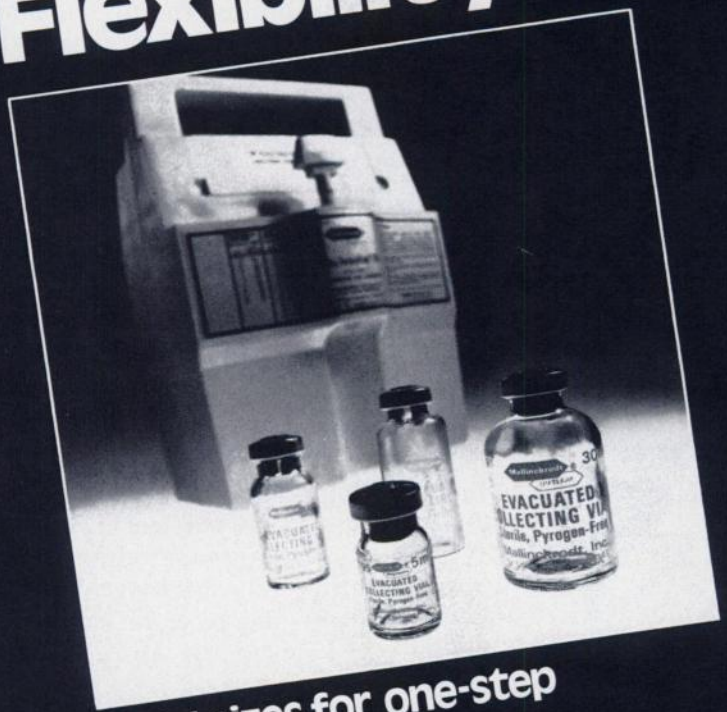

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Tomographic thallium imaging

Robert A. Vogel, MD
Associate Professor of Medicine
University of Colorado Health Sciences Center
Director, Coronary Care Unit and Medical Intensive Care Unit
Denver VA Medical Center

Dennis L. Kirch, MSEE
Assistant Professor of Radiology
University of Colorado Health Sciences Center
Research Engineer
Denver VA Medical Center

The initiative for tomographic thallium imaging arises from the segmental nature of coronary artery disease—which typically affects one portion of the myocardium more severely than others. An ischemic area of the heart that takes up less thallium may overlap or underlie another, normally perfused region. Planar imaging may resolve small deficits juxtaposed to normally perfused myocardium only with difficulty. Tomographic imaging may enable spatial separation of high- and low-uptake regions at different depths, thereby providing a better image of regional ischemia.

Thallium myocardial tomography provides advantages in addition to a series of depth-separated Z-axis images of relative isotope uptake. It ensures that the entire study is acquired as early as possible after injection, before any significant redistribution takes place, because only a single left oblique view is required to provide the data on regional thallium uptake provided in planar imaging by multiple views. And possibly of greatest importance, the technique permits objective computerized quantification of regional isotope uptake and redistribution—circumferential profile analysis—simplifying detection and interpretation of regional differences in thallium redistribution.

These three attributes together—Z-axis resolution, single-view image acquisition, and objective regional quantification—have increased the sensitivity and specificity of thallium myocardial perfusion imaging in our department to 90% or better. Optimum utilization of this imaging/image-processing technique requires a thorough technical appreciation of several features of the tomographic collimator and software.

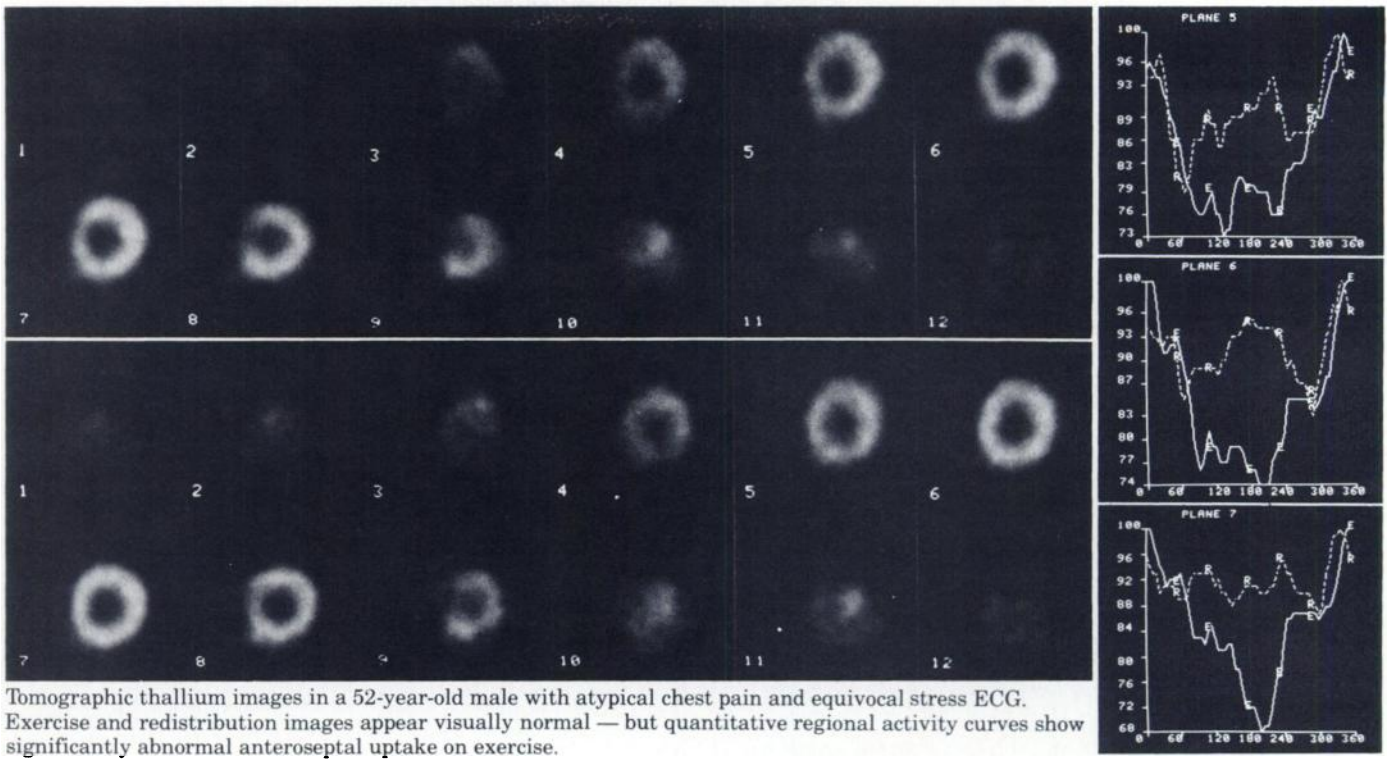
The seven-pinhole collimator

The seven-pinhole collimator is not a completely revolutionary or untried concept; rather it represents the combination of two well-accepted concepts in order to better image the thallium-perfused myocardium: single-pinhole collimation and rotating slant-hole collimation. A single-pinhole collimator can produce superior magnified myocardial images with only a minimal contribution from noncardiac background, but its low sensitivity lengthens acquisition time so much that significant redistribution may occur before a view is complete. The rotating slant-hole collimator was pioneered early in the development of the Anger camera as a technique to produce tomographic images. But it is a cumbersome device that is difficult to utilize rapidly and repeatedly, and uses a simple back-projection tomographic reconstruction technique unsatisfactory for myocardial imaging.

The seven-pinhole collimator represents a combination of these two techniques. By projecting seven pinhole images on the crystal, several advantages are gained:

- Instead of projecting a single image onto perhaps 10% of the camera crystal, and imaging background counts with the remaining 90%, the seven-pinhole collimator can project seven 1:1 myocardial images with very little noncardiac background contribution. This full utilization of the crystal for organ imaging makes the seven-pinhole collimator comparable in sensitivity to a high-sensitivity standard collimator... capable of collecting up to 750,000 myocardial counts within 10 minutes.
- Instead of developing angular perspective by taking several sequential planar views, or by rotating a slant-hole collimator, the seven-pinhole collimator uses the seven pinholes to simultaneously view the heart from slightly different angular perspectives, from which computer processing can provide tomographic reconstruction.

To these collimator-derived benefits, one must add two benefits from the quantitative analysis of seven-pinhole imaging: *enhanced subjective confidence* in the presence or absence of perfusion deficits on the displayed images and *objective quantification* of relative thallium distribution and redistribution kinetics in each of the important tomographic planes through the myocardium.



Tomographic thallium images in a 52-year-old male with atypical chest pain and equivocal stress ECG. Exercise and redistribution images appear visually normal — but quantitative regional activity curves show significantly abnormal anteroseptal uptake on exercise.

The impedance-estimation algorithm

Traditionally, tomographic nuclear images have been reconstructed by *back projection*, as in the original rotating slant-hole system, and in the Searle PhoCon. More complete, faster processing — with iterative capability for error correction — results from the use of the impedance-estimation technique of the seven-pinhole program.

The basic principle of this program is that a *voxel*, a volume element in space, has been viewed from seven points projected through pinholes onto the crystal. The program applies an *impedance-estimation algorithm* to the summing of the seven perspectives of each voxel, so that the lowest number of counts detected from any one perspective will dominate the greater counts detected from the other six—much as a single low-resistance resistor will conduct more current than numerous high-resistance elements in a parallel electrical circuit.

We believe this impedance-estimation program provides an initial estimate of real voxel value that is closer to actual isotope distribution than is possible with simple back projection. With a single 1- to 2-minute iterative pass to refine this estimate, the algorithm provides an accurate derivation of isotope distribution in a specific tomographic plane. Thus, the clinician can be confident that any perfusion defect which can be resolved by the camera/collimator is certain to be detected and displayed on the resultant "hard" image...without substantial degradation by overlying or surrounding normally perfused tissue, or by redistribution during image acquisition.

Circumferential quantification

Circumferential profile analysis of thallium-201 tomographic images may significantly increase the accuracy of evaluating regional thallium uptake and comparing uptake/redistribution kinetics. This quantification technique defines the center of the left ventricle, divides the myocardium into a predetermined number of segments, then quantitatively plots the relative thallium uptake in each segment against its angular location on the left ventricular wall. The procedure, as performed at the Denver VA Medical Center, permits objective comparison of stress/redistribution uptake curves—even in regions where ischemia cannot confidently be diagnosed solely by visual examination of the images.

In summary, the tomographic process reduces patient imaging time and, in our experience, has enabled improved visualization of segmental abnormalities in thallium-201 distribution, and has offered a means of data presentation well suited to quantitative interpretation and correlation.

Please see following page for brief summary of prescribing information.

Thallous Chloride Tl 201

November 1977

INDICATIONS AND USAGE: Thallous Chloride Tl 201 may be useful in myocardial perfusion imaging for the diagnosis and localization of myocardial infarction.

It may also be useful in conjunction with exercise stress testing as an adjunct in the diagnosis of ischemic heart disease (atherosclerotic coronary artery disease).

CONTRAINDICATIONS: None known.

WARNINGS: In studying patients in whom myocardial infarction or ischemia is known or suspected, care should be taken to assure continuous clinical monitoring and treatment in accordance with safe, accepted procedure. Exercise stress testing should be performed only under the supervision of a qualified physician and in a laboratory equipped with appropriate resuscitation and support apparatus.

Ideally examinations using radiopharmaceutical drug products – especially those elective in nature – of women of childbearing capability should be performed during the first ten days following the onset of menses.

PRECAUTIONS: Data are not available concerning the effect of marked alterations in blood glucose, insulin, or pH (such as is found in diabetes mellitus) on the quality of thallium Tl 201 scans. Attention is directed to the fact that thallium is a potassium analog, and since the transport of potassium is affected by these factors, the possibility exists that the thallium may likewise be affected.

Thallous Chloride Tl 201, as all radioactive materials, must be handled with care and used with appropriate safety measures to minimize external radiation exposure to clinical personnel. Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

No long-term animal studies have been performed to evaluate carcinogenic potential.

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Thallous Chloride Tl 201 should be used in pregnant women only when clearly needed.

It is not known whether this drug is excreted in human milk. As a general rule nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: Adverse reactions related to use of this agent have not been reported to date.

DOSAGE AND ADMINISTRATION: The recommended adult (70kg) dose of Thallous Chloride Tl 201 is 1-1.5mCi. Thallous Chloride Tl 201 is intended for intravenous administration only.

For patients undergoing resting thallium studies, imaging is optimally begun within 10-20 minutes after injection. Several investigators have reported improved myocardial-to-background ratios when patients are injected in the fasting state, in an upright posture, or after briefly ambulating.

Best results with thallium imaging performed in conjunction with exercise stress testing appear to be obtained if the thallium is administered when the patient reaches maximum stress and when the stress is continued for 30 seconds to one minute after injection. Imaging should begin within ten minutes post-injection since target-to-background ratio is optimum by that time. Several investigators have reported significant decreases in the target-to-background ratios of lesions attributable to transient ischemia by two hours after the completion of stress testing.

The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

Radiopharmaceuticals should be used by persons with specific training in the safe use and handling of radionuclides produced by nuclear reactor or particle accelerator and whose experience and training have been approved by the appropriate government agencies authorized to license the use of radionuclides.

HOW SUPPLIED: Thallous Chloride Tl 201 for intravenous administration is supplied as a sterile, non-pyrogenic solution containing at calibration time, 1mCi/ml of Thallous Tl 201, 9mg/ml sodium chloride, and 9mg/ml of benzyl alcohol. The pH is adjusted to between 4.5-6.5 with hydrochloric acid and/or sodium hydroxide solution. Vials are available in the following quantities of radioactivity: 1.5, 3.0, 4.5, 6.0, and 9.0 millicuries of Thallous Tl 201.
The contents of the vial are radioactive. Adequate shielding and handling precautions must be maintained.

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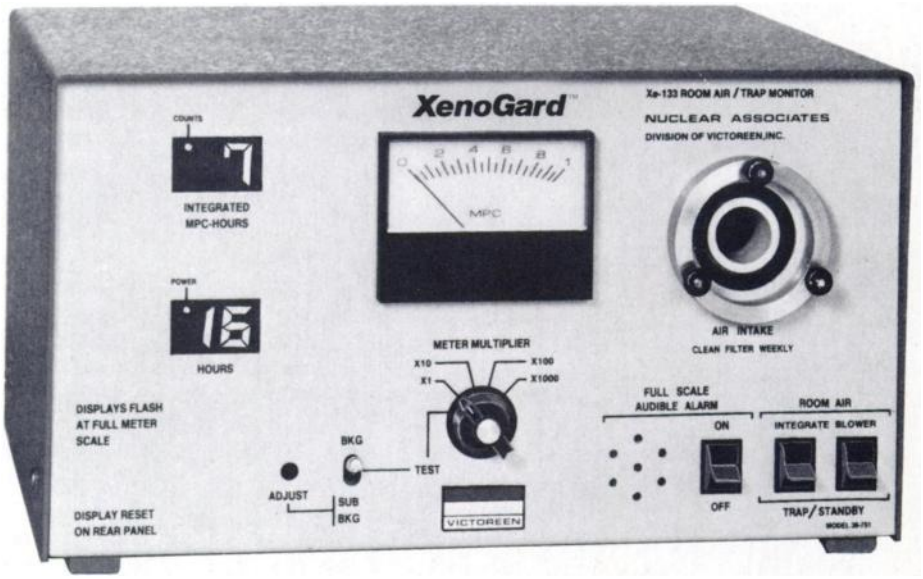

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[1] The Code of Federal Regulations† clearly limits the permissible ^{133}Xe exposure to 1 MPC for 40 hours per week for 13 weeks. The data is continuously updated and displayed by the "XenoGard."

†*10 CFR, Part 20, Sec. 20.103 and Appendix B, Table 1.*

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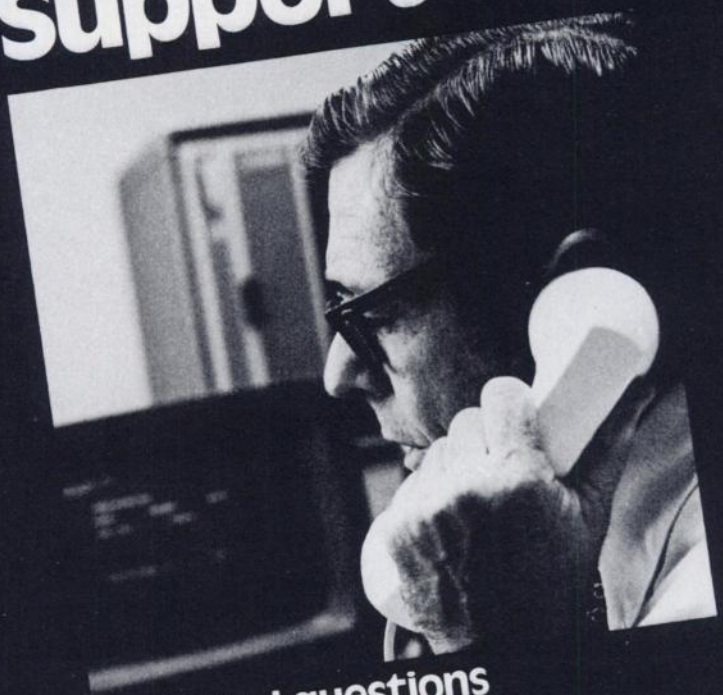

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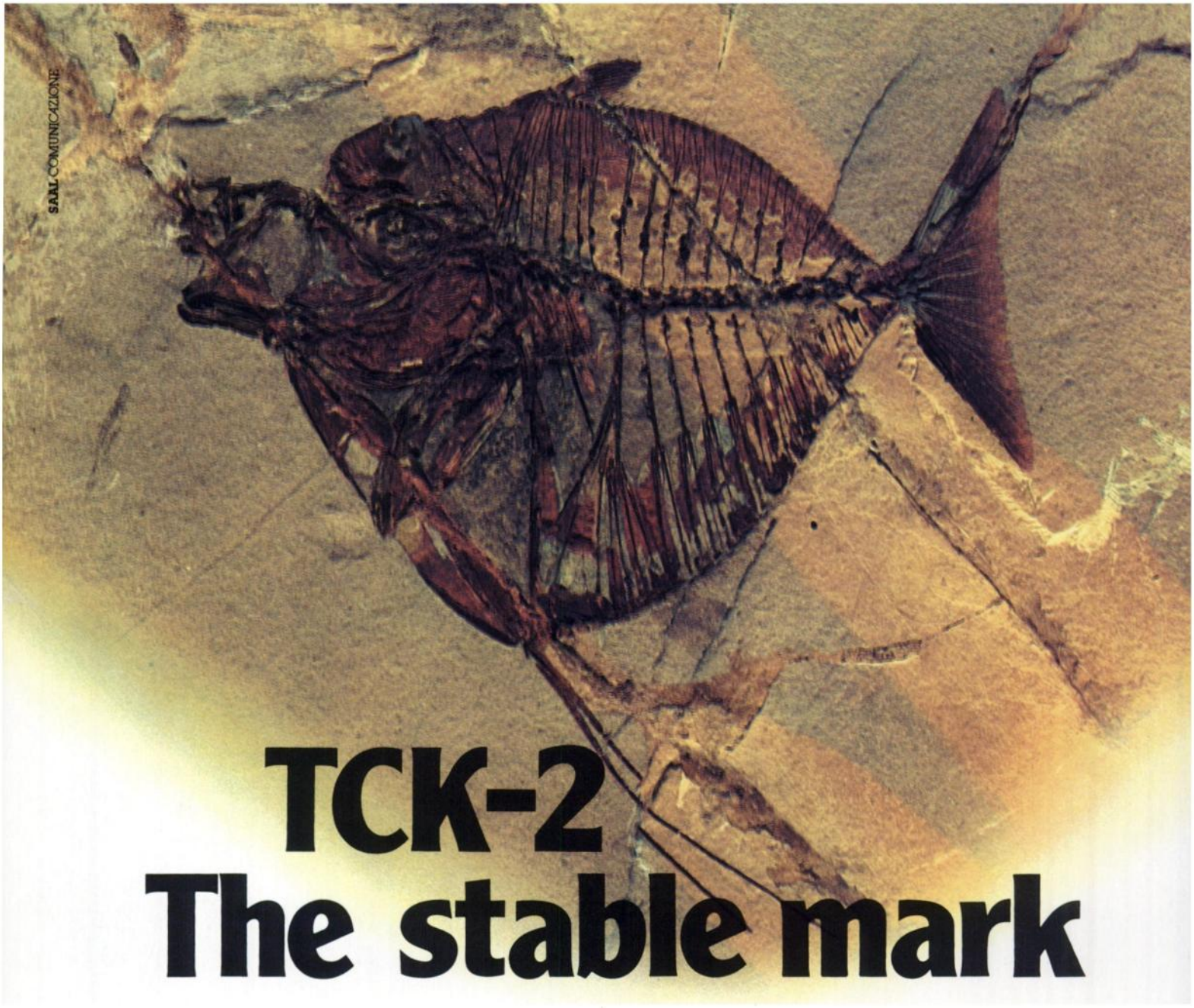

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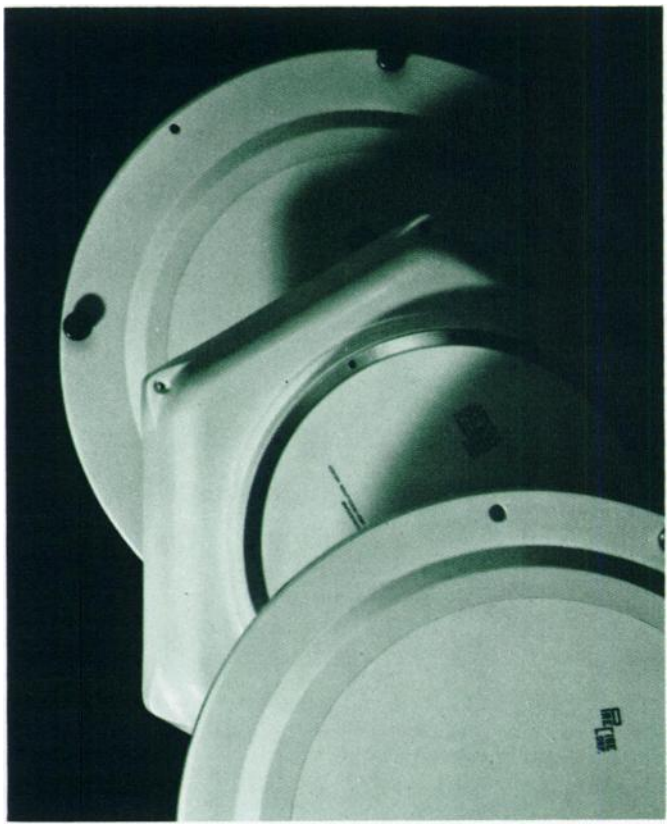

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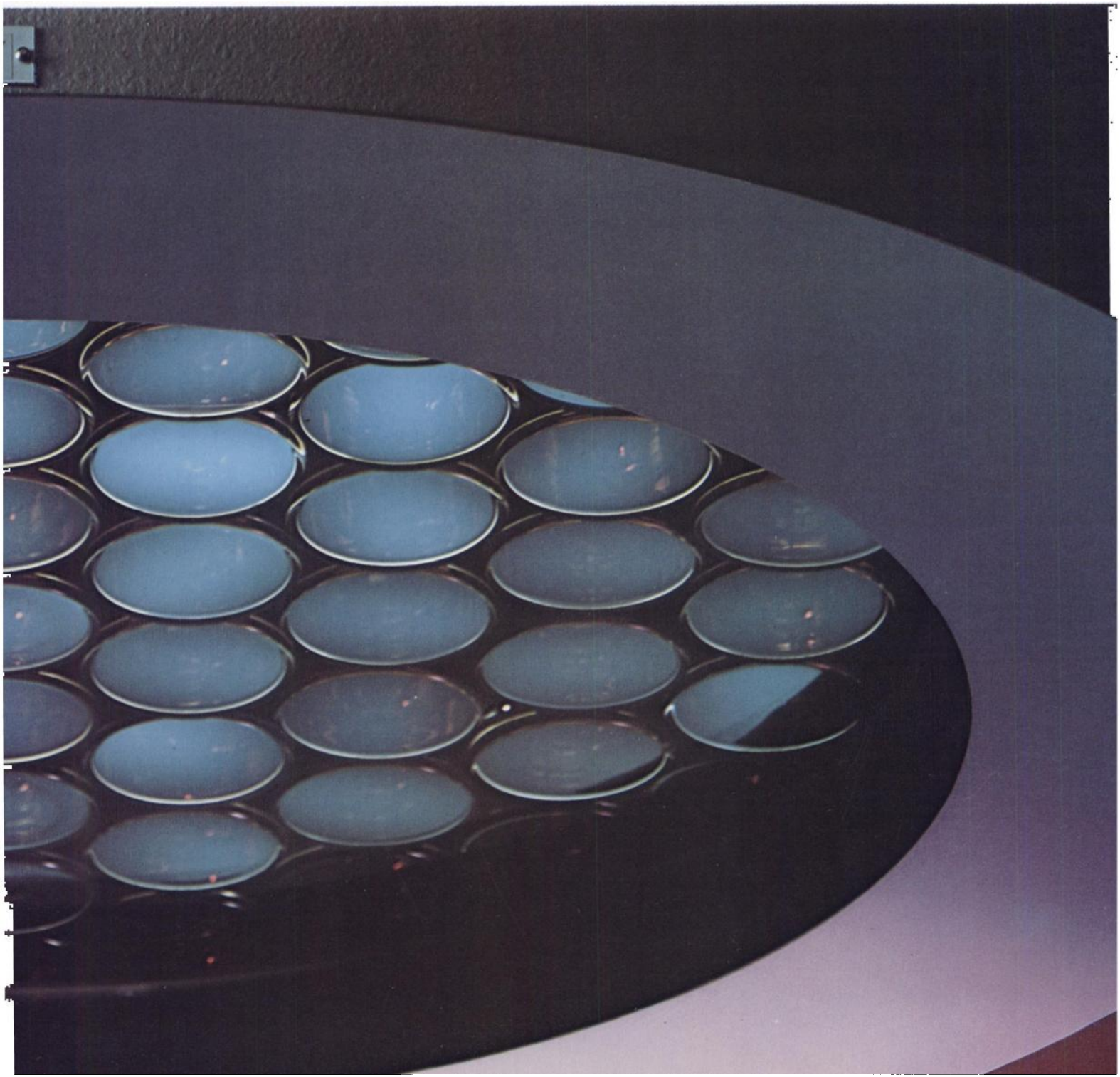

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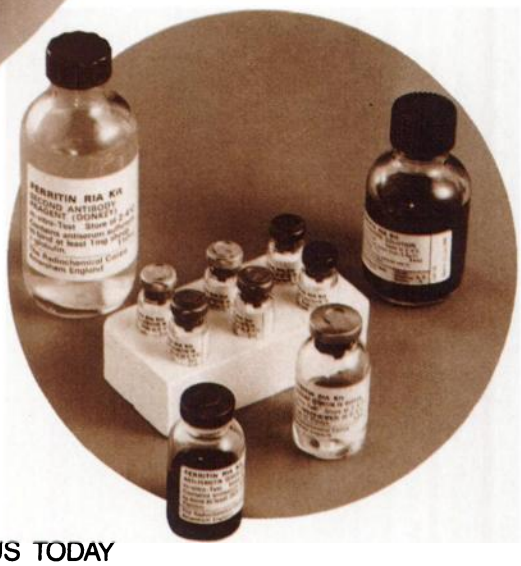

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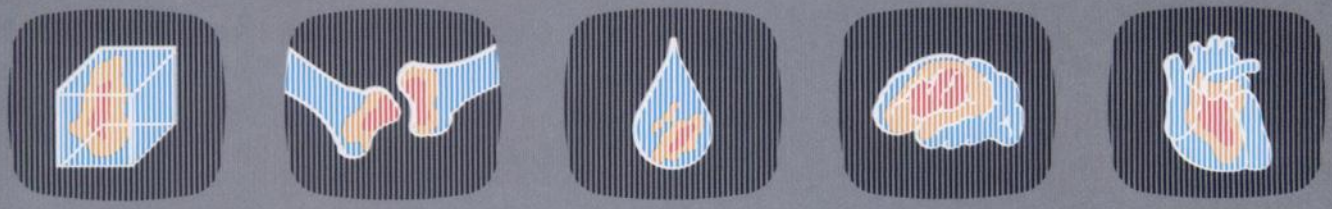

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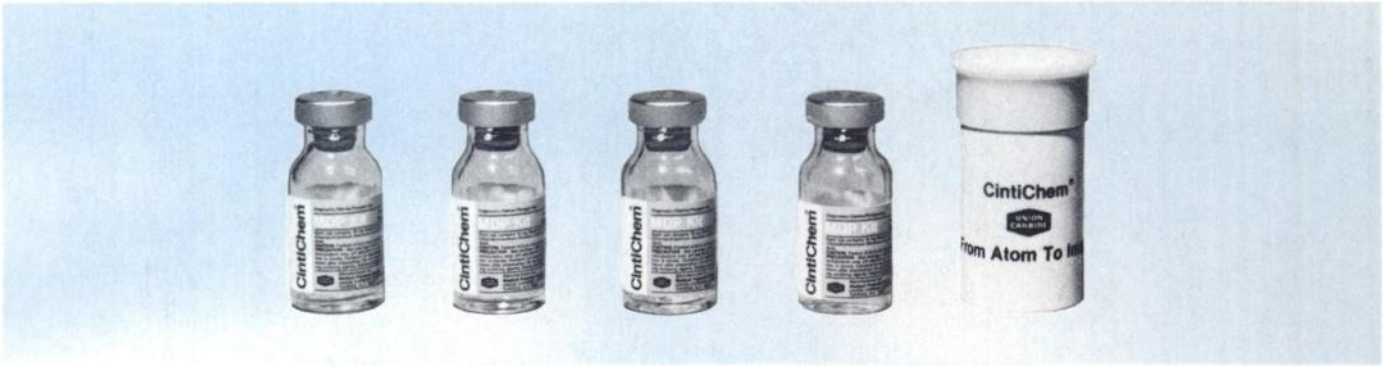

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Technetium Tc 99m Medronate Kit

BRIEF SUMMARY OF PRESCRIBING INFORMATION

indications and usage
Technetium Tc 99m Medronate may be used as a bone imaging agent to delineate areas of altered osteogenesis.

contraindications
None known.

warnings
This class of compound is known to complex cations such as calcium. Particular caution should be used with patients who have, or who may be predisposed to, hypocalcemia (i.e., alkalosis).

This radiopharmaceutical drug product should not be administered to children, to pregnant women, or to nursing mothers, unless the expected benefit to be gained outweighs the potential risk.

Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

precautions

general

Technetium Tc 99m Medronate as well as other radioactive drugs, must be handled with care and appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Also, care should be taken to minimize radiation exposure to the patients consistent with proper patient management.

To minimize radiation dose to the bladder, the patient should be encouraged to void when the examination is completed and as often thereafter as possible for the next 4-6 hours.

This preparation contains no bacteriostatic preservative.

Technetium Tc 99m Medronate should be formulated within six (6) hours prior to clinical use.

pregnancy category C

Adequate reproductive studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m Medronate should be used in pregnant women only when clearly needed.

nursing mothers

It is not known whether this drug is excreted in human milk. As a general rule nursing should not be undertaken while a patient is on the drug since many drugs are excreted in human milk.

pediatric use

Safety and effectiveness in children have not been established .

adverse reactions
No adverse reactions specifically attributable to the use of Technetium Tc 99m Medronate have been reported.

how supplied
Union Carbide's Technetium Tc 99m Medronate Kit is supplied as a sterile, pyrogen-free kit containing 5 vials.

Each 10 ml vial contains 10 mg medronic acid, 0.17 mg (minimum) stannous chloride (maximum stannous and stannic chloride 0.29 mg), and 2 mg ascorbic acid. The pH has been adjusted to 4-8 with either HCl or NaOH prior to lyophilization. Following lyophilization, the vials are sealed under a nitrogen atmosphere.

Product #17500502 Multidose vial shield with cap and retainer ring available separately.

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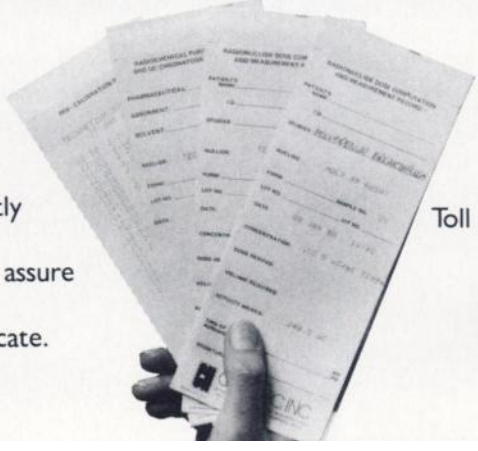

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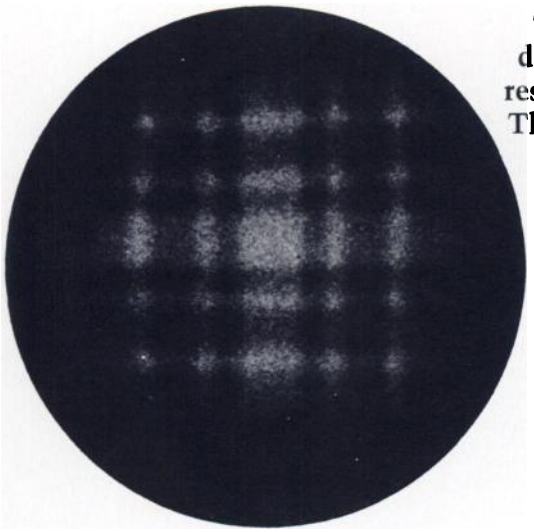

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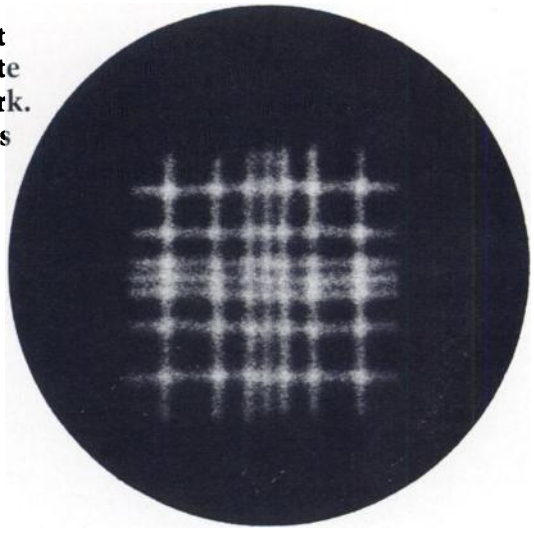

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PLACEMENT

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NUCLEAR MEDICINE RESIDENCY. 830-bed VA general hospital offers AMA approved two year program. Two positions available July 1981. Located in San Fernando Valley area of Los Angeles, 15 minutes from affiliated hospitals (UCLA and Wadsworth VA). Program covers isotope and ultrasound imaging, in vivo and in vitro procedures, including RIA, and all recent computer and cardiology procedures. Prerequisite: Two years post graduate training in medicine, radiology, or pathology. Minimum stipend: $23,438. Contact: Marvin B. Cohen, M.D., Chief, Nuclear Medicine Service. Nondiscrimination in employment. VA Medical Center, 16111 Plummer Street, Sepulveda, CA 91343

ACADEMIC POSITION AT THE ASSOciate or Assistant Professor level available in the Nuclear Radiology Division of the Department of Radiology at the University of Texas Medical School at Houston. Certification in Radiology and Nuclear Medicine, or in Radiology with Special Competence in Nuclear Radiology is required. Applicant should have a sincere interest and a performance record in relevant clinical or basic nuclear research. Please send curriculum vitae to Robert W. McConnell, M.D., Director, Division of Nuclear Radiology, Department of Radiology, The University of Texas Medical School at Houston, 6431 Fannin Street, Houston, Texas 77030.

NUCLEAR MEDICINE TECHNOLOGIST. Position available for registered or registry eligible nuclear medicine technologist to work with outreach program serving several community hospitals. This program is part of a progressive 521 bed hospital which provides technical and physicist support as well as continuing education. Excellent compensation package available. Please send resume to Charlotte Ament, Nuclear Medicine Department, Research Medical center, 2316 E. Meyer Blvd., Kansas City, Missouri 64132 or call (816) 276-4235.

NUCLEAR PHARMACIST-STAFF POsitions available immediately in centralized nuclear pharmacies located throughout the United States. Board certified applicants with radiopharmacy experience preferred. Also good opportunities for management oriented applicants. Excellent fringe benefits programs. Salary commensurate with experience. Send resume and salary history to Personnel Department, Nuclear Pharmacy, Inc., P.O. Box 25141, Albuquerque, N.M., 87125, or call (505) 292-5820. EOE.

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NUCLEAR MEDICINE TECHNOLOGIST. Staff position in 185-bed acute care hospital offers opportunity for professional growth to registered or registry eligible Nuclear Medicine Technologist. Excellent salary and benefit program. Send resumes to: Personnel Dept., Bothwell Memorial Hospital, 644 E. 13th, Sedalia, Missouri or call (816) 826-8833, Ext. 526. EOE.

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RADIOLOGIST, BOARD CERTIFIED IN Nuclear Medicine, to join large multi-specialty prepaid medical group. Opportunity to expand department and plan department for new hospital in 1984. Salary negotiable. Liberal fringe benefits. Contact: Hawaii Permanente Medical Group, Inc. 1697 Ala Moana Boulevard, Honolulu, Hawaii 96815. (An equal opportunity employer)

NUCLEAR MEDICINE TECHNOLOGIST. Full time position for registered or registry eligible Nuclear Medicine Technologist to join Nuclear Medicine Department of progressive 286 bed hospital in sunny Arizona. Full range of in-vivo procedures, 2 gamma cameras with computer. Good salary and employee benefits. Send resume to: Personnel Dept., Mesa Lutheran Hospital, 525 West Brown Rd., Mesa, Az. 85201.

RESIDENCIES IN NUCLEAR MEDICINE The Nuclear Medicine & Ultrasound Service at Veterans Administration Wadsworth Medical Center invites applications for its Residency Program. This training program is approved by the Liaison Committee on Graduate Medical Education and satisfies the residency requirements of the American Board of Nuclear Medicine. Intensive experience in clinical nuclear medicine in a new modern facility is offered. Opportunity is also provided to develop competence in ultrasonography and other correlative imaging modalities, in vitro diagnostic procedures, radiopharmaceutical techniques and therapy with unsealed radioactive sources. Didactic instruction includes mathematics, nuclear physics, radiochemistry, radiobiology, and physiology. Affiliation with nearby UCLA School of Medicine provides the opportunity for continued academic involvement. Salary range is $25,077 to $28,605 depending upon prior postgraduate training.

Affirmative Action/Equal Opportunity Employer. Contact: William H. Blahd, M.D., Chief, Nuclear Medicine & Ultrasound Service, VA Wadsworth Medical Center, Wilshire & Sawtelle Blvds., Los Angeles, CA 90073.

NUCLEAR MEDICAL TECHNOLOGIST. St. Joseph, a progressive, acute care hospital, has an opportunity for the experienced Nuclear Medical Technologist (registered) who meets AMA approved academic standards (MT/ASCP or ARRT), but will consider registry eligible new graduates for a full-time staff position in our modern Pathology and Nuclear Medicine Department. You will participate in the instruction of students on clinical rotations. We offer a competitive salary and comprehensive benefits. Send your resume or Call Collect: (312) 975-3013, Jan Burdulis, St. Joseph Hospital, 2900 N. Lake Shore Dr., Chicago, Illinois 60657. An Equal Opportunity Employer.

NUCLEAR MEDICINE RESIDENT. Two year residency program in nuclear medicine at The New York Hospital-Cornell Medical Center. Positions available July 1, 1981. Contact Jerome G. Jacobstein, M.D., Division of Nuclear Medicine, The New York Hospital-Cornell Medical Center, 525 East 68th Street, New York, New York 10021.

NUCLEAR MEDICINE CLINICAL SUpervisor. We are currently seeking an individual with at least 2 years experience in Nuclear Medicine Technology to supervise and coordinate our Outreach Nuclear Medicine Clinical Program. This program is part of a progressive 561 bed hospital which provides technical and physicist support as well as continuing education. Excellent compensation available. Please send resume to: Larry Brady, Administrative Co-ordinator, Research Medical Center, 2316 E. Meyer Boulevard, Kansas City, Missouri 64132. Equal Opportunity/Handicapped Employer.

IMMEDIATE OPENING FOR REGISTered Nuclear Medicine Technologist (or board eligible) in a 300 bed fully accredited teaching hospital. Apply or send resume to Personnel Office, U.S. Public Health Service Hospital, 210 State Street, New Orleans, LA 70118, Phone (504) 899-3441. An equal opportunity employer.

RADIOPHARMACEUTICAL SCIENTIST with training and/or experience in a biological chemical or pharmaceutical science and the handling of radioactive materials. Should be certified or eligible for certification in the American Board of Science in Nuclear Medicine and/or the American Pharmaceutical Association Academy of Pharmacy Practice. Responsibilities will include taking part in ongoing departmental research and training, and working with the Director of Nuclear Pharmacy in insuring uninterrupted radiopharmaceutical services. Inquiries should include a curriculum vitae and a statement of career interest. We are an equal opportunity employer. Applications should be sent to: Allan H. Gobuty, Pharm.D., M.S. Director, Nuclear Pharmacy Services, University of Kansas Medical Center, 2125 Bell Memorial Hospital, Kansas City, Kansas 66103.

NUCLEAR MEDICINE TECHNOLOGIST Challenging position for registered technologist in progressive dept. Must have a working knowledge of nuclear imaging and radioimmunoassays. Good salary and superior benefits. Send resume or contact Director, Employee Relations, University Community Hospital, 3100 E. Fletcher Avenue, Tampa, Florida 33612.

STAFF NUCLEAR MEDICINE TECHNOLOGIST. Full time position available in a modern 90 bed general acute care hospital. Staff Nuclear Medicine position in a rapidly expanding department. Must be registerd or registry eligible. Competitive salary scale, excellent benefit program. Contact Nuclear Medicine-Community Memorial Hospital, 1000 West Harlem Avenue, Monmouth, Illinois 61462. (309) 734-3141.

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NUCLEAR MEDICINE PHYSICIAN, ABNM, ABIM, FACP seeks relocation as Director of Nuclear Medicine at processive hospital. Currently Director of active Department of Nuclear Medicine and Diagnostic Ultrasound. Experienced in all aspects of these specialties (administration, imaging, RIA, computers, cardiology B-Mode and real-time ultrasound). All positions will be considered. For further information and C.V., reply Box 901, Society of Nuclear Medicine, 475 Park Avenue South, New York, New York 10016.

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This section in the *Journal of Nuclear Medicine* contains "Positions Open", "Positions Wanted", and "For Sale" listing. Nondisplay "Positions Wanted" ads by members of the Society are billed at 60¢ per word for each insertion with no minimum rate. Nondisplay "Positions Wanted" ads by nonmembers and all nondisplay "Positions Open" and "For Sale" ads by members and nonmembers are charged at 85¢ per word. Display advertisements are accepted at $125 for ⅛ page, $185 for ¼ page, $295 for ½ page, and $510 for a full page. Closing date for each issue is the 1st of the month preceding publication. Agency commissions and cash discounts are allowed on display ads only. Box numbers are available for those who wish them.

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STAFF NUCLEAR MEDICINE TECHNOLOGIST

Join the staff of a progressive department of Radiology at one of the Carolina's most dynamic general acute care hospitals. Must be registered or registry eligible. Excellent starting rate and extensive fringe benefit package. Lovely college community, close to beaches and mountains. For additional information, call collect: (919) 399-8136 or write to: Personnel Office, Wilson Memorial Hospital, 1705 S. Tarboro Street, Wilson, North Carolina 27893.

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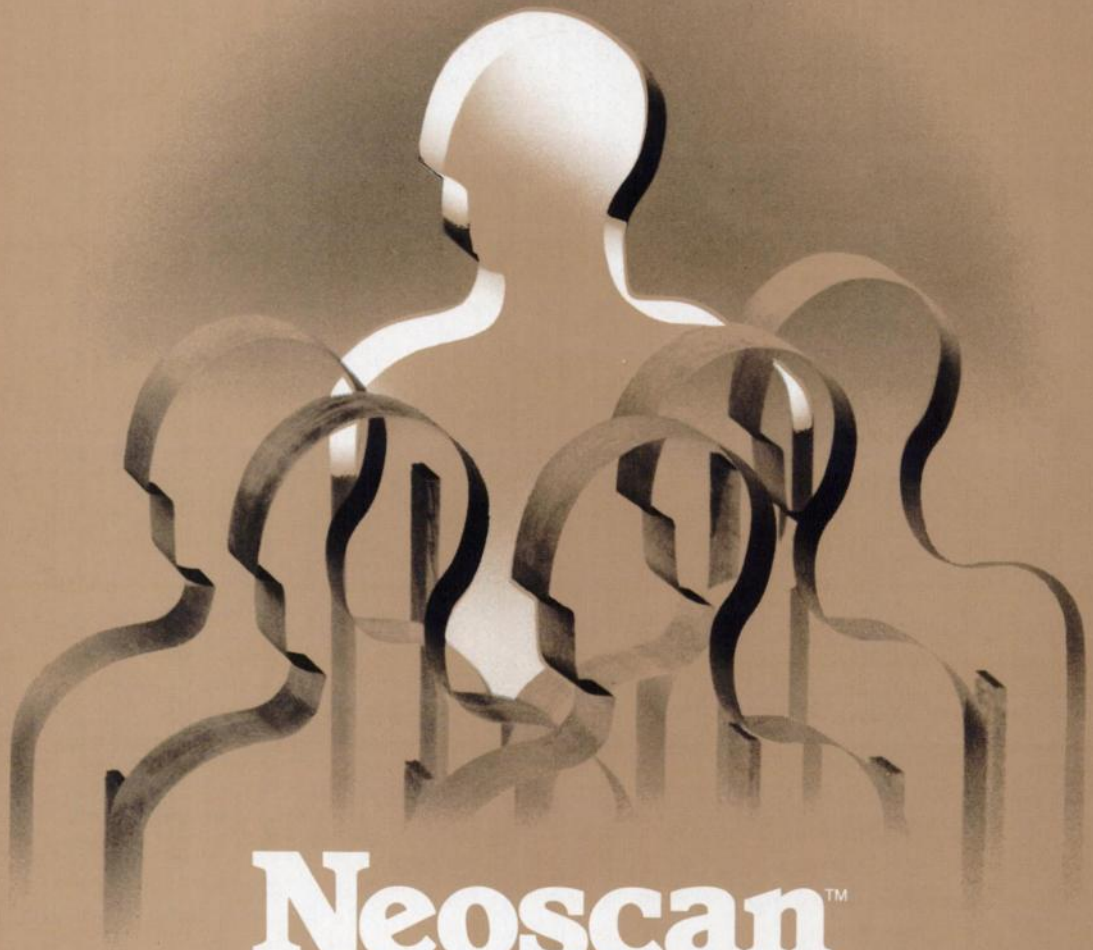

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gallium citrate Ga 67

from medi+physics™

NEOSCAN MEANS gallium citrate Ga 67 from Medi-Physics, Inc. Neoscan can aid in demonstrating the presence and extent of Hodgkin's disease, lymphoma *and* bronchogenic carcinoma. Positive uptake in the absence of prior symptoms warrants follow-up as an indication of a potential disease state.

NEOSCAN MEANS a gallium citrate Ga 67 that is produced by MPI on both the East and West Coasts and is available from 4 locations across the country for easy access when you need it. Neoscan is calibrated twice weekly in two convenient sizes: 3.0mCi and 13.2mCi.

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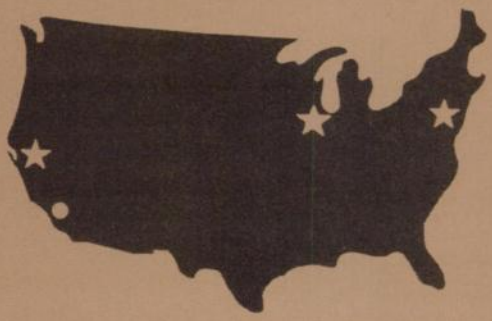

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Neoscan™
gallium citrate Ga 67

For complete product information, consult the package insert, a summary of which follows:

DESCRIPTION: Neoscan for diagnostic use is supplied as a sterile, apyrogenic aqueous solution for intravenous injection. Each milliliter of the solution contains 2 millicuries of gallium Ga 67 at calibration time, no-carrier-added, 2.5% sodium citrate, and 1% benzyl alcohol as a preservative. The pH is between 4.5-7.5. Gallium Ga 67, with a half-life of 78.1 hours, is cyclotron produced by the proton irradiation of zinc Zn 68-enriched zinc oxide. The radionuclidic composition, at calibration time, is not less than 98.9% of the total activity from gallium 67 with less than 1% of the total radioactivity due to gallium 66 and with zinc 65 and other radiocontaminants contributing less than 0.1% of the total activity.

INDICATIONS AND USAGE: Neoscan may be useful to demonstrate the presence and extent of Hodgkin's disease, lymphomas, and bronchogenic carcinoma. Positive gallium Ga 67 uptake in the absence of prior symptoms warrants follow-up as an indication of a potential disease state.

CONTRAINDICATIONS: None known.

WARNINGS: This radiopharmaceutical should not be administered to children or to patients who are pregnant or to nursing mothers unless the information to be gained outweighs the potential hazards. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, in women of child-bearing capability should be performed during the first few (approximately 10) days following the onset of menses.

PRECAUTIONS: A thorough knowledge of the normal distribution of intravenously administered gallium citrate Ga 67 is essential in order to accurately interpret pathologic studies. The finding of an abnormal gallium concentration usually implies the existence of underlying pathology, but further diagnostic studies should be done to distinguish benign from malignant lesions. Neoscan is intended for use as an adjunct in the diagnosis of certain neoplasms. Negative results do not preclude the presence of disease.

Gallium citrate Ga 67 as well as other radioactive drugs, must be handled with care. Appropriate safety measures should be used to minimize radiation exposure to clinical personnel and to patients, consistent with proper patient management.

No long-term animal studies have been performed to evaluate carcinogenic potential.

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Gallium citrate Ga 67 should be used in pregnant women only when clearly needed.

Gallium citrate Ga 67 has been found to accumulate in breast milk and should not be used in nursing mothers.

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: No adverse reactions have been reported with the use of Neoscan at this time.

DOSAGE AND ADMINISTRATION: The recommended adult (70 kg) dose is 2-5 millicuries. Neoscan is intended for intravenous administration only. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

Studies indicate the optimal tumor-to-background concentration ratios are often obtained about 48 hours after administration. However, considerable biological variability may occur in individuals, and acceptable images may be obtained as early as 6 hours and as late as 120 hours after injection.

Approximately 10% of the administered dose is excreted in the feces during the first week after injection. Daily laxatives and/or enemas are recommended from the first day of injection until the final images are obtained in order to cleanse the bowel of radioactive material and minimize the possibility of false positive studies.

Radiopharmaceuticals should be used only by persons who are qualified by training and experience in the safe use and handling of radionuclides and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

HOW SUPPLIED: Neoscan is supplied as a no-carrier-added sterile apyrogenic aqueous solution for intravenous use. Each milliliter contains 2 mCi ± 10% gallium Ga 67 at the time of calibration with 2.5% sodium citrate. Benzyl alcohol 1% is present as a preservative. The pH is between 4.5-7.5.

The contents of the vial are radioactive and adequate shielding and handling precautions must be maintained.

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medi+physics™

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- ■SI-21 **Perfusion Studies of the Ischemic Heart** *by Glen W. Hamilton, M.D.*
- ■SI-22 **Detection of Acute Myocardial Infarction** *by B. Leonard Holman, M.D.*
- ■SI-23 **Instrumentation for Nuclear Cardiology** *by Trevor D. Cradduck, Ph.D.*

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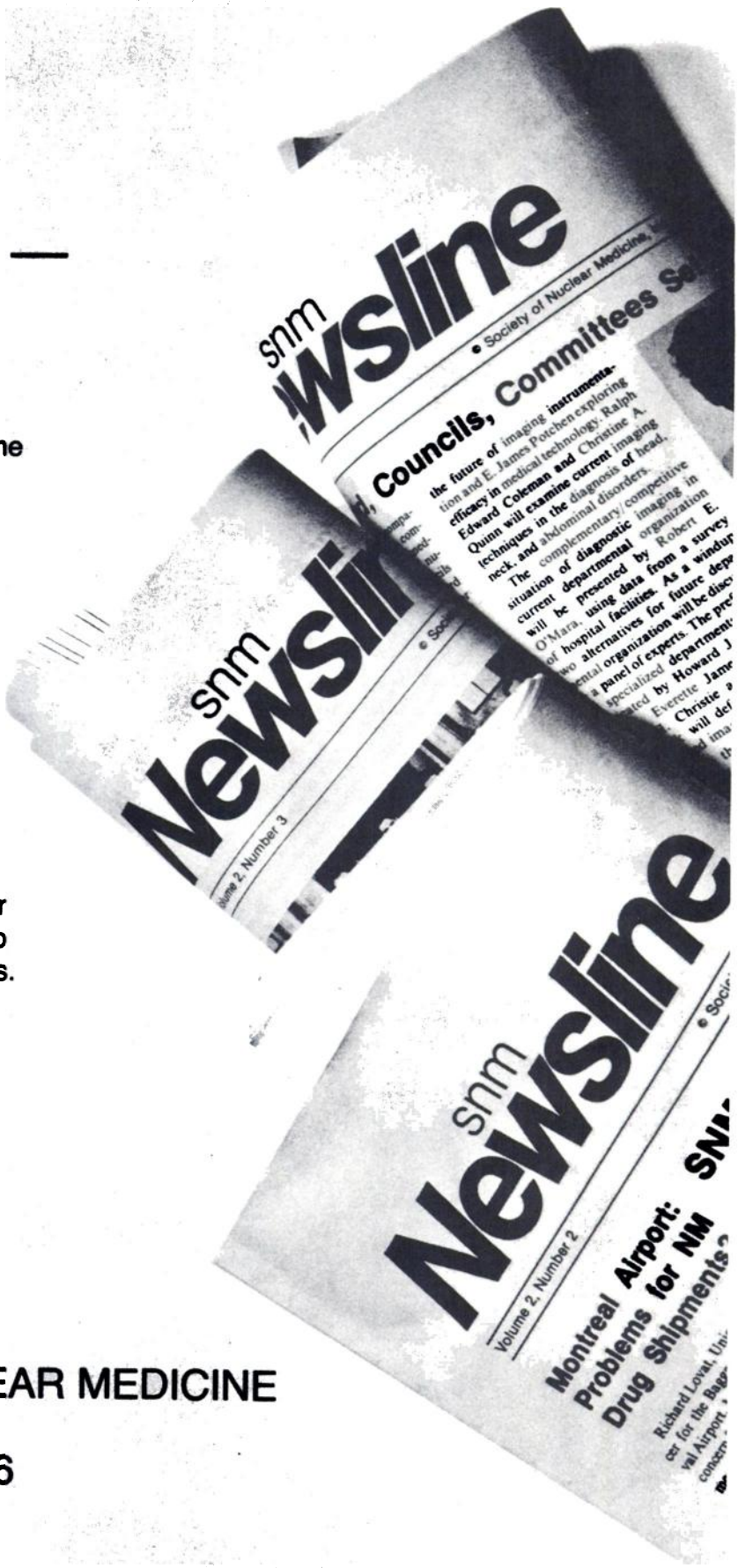
JNM 9/80

The newspaper of nuclear medicine —

SNM NEWSLINE is a newspaper, published every other month with the specific goal of bringing nuclear medicine specialists the latest news — about legislation, the FDA, NBS, grants, appropriations, people in the field, and what the many-faceted and rapidly growing Society of Nuclear Medicine is doing.

It's easy to read, lively, sometimes controversial — the newspaper everybody in the field and related disciplines *needs* to keep up-to-date on the non-technical, but immensely important, issues facing nuclear medicine. A copy (or two) should be available in every department of nuclear medicine and every library that caters to nuclear medicine and related specialties.



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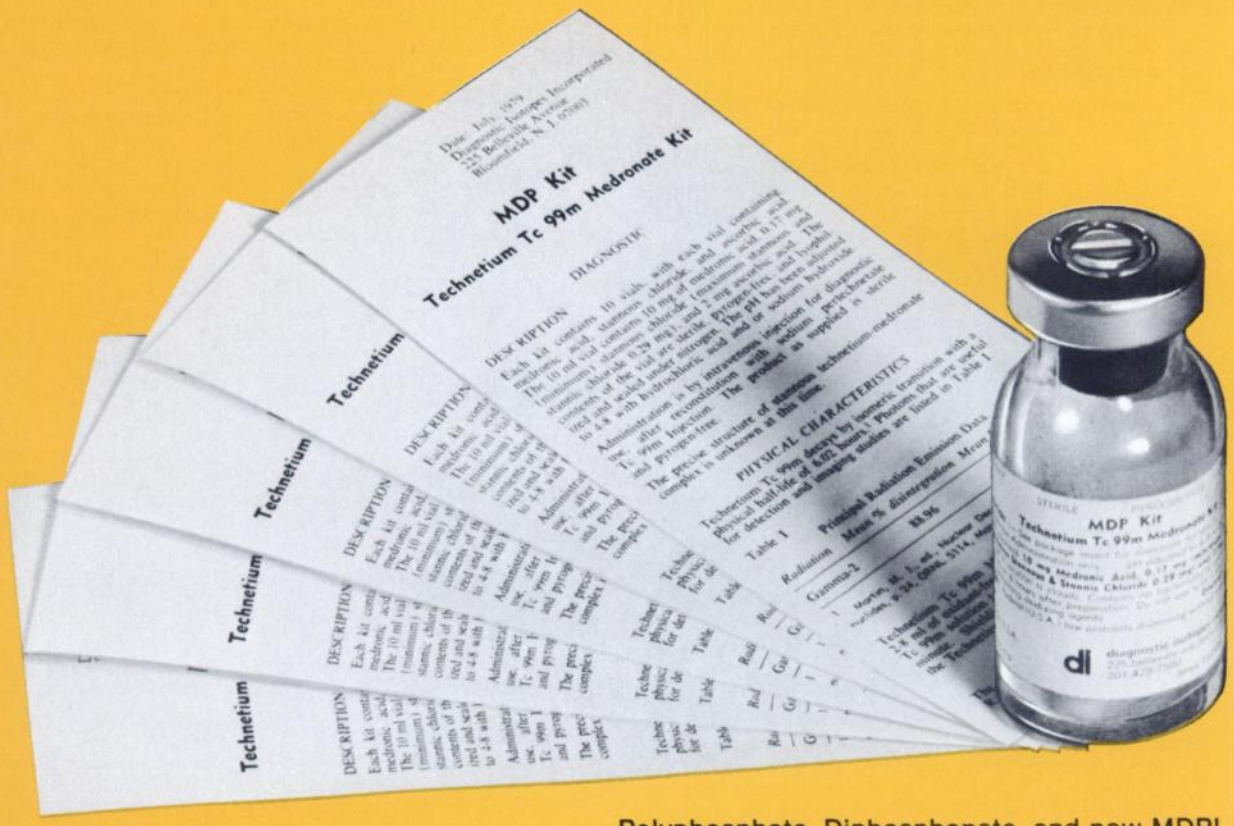
THE SOCIETY OF NUCLEAR MEDICINE
475 Park Avenue South
New York, New York 10016

We think our newest bone imaging agent is our best!

DIAGNOSTIC ISOTOPES MDP

(Technetium Tc 99m Medronate Kit)



Polyphosphate, Diphosphonate, and now MDP! Studies indicate MDP to be a superior agent for skeletal imaging* and Diagnostic Isotopes, a pioneer in bone imaging agents, is proud to add MDP to its line of kits. MDP is conveniently packaged in 10 multi-dose vial kits which may be stored at room temperature with a shelf life of one year from date of manufacture.

Our discount policy has been liberalized to permit discounts on smaller quantities. Discounts may be earned by ordering five or more of one kit or any combination of kits listed below.

Diagnostic Kits Available: Sulfur Colloid, MDP, DTPA, MAA, HSA, Diphosphonate, Polyphosphate.

*G. Subramanian, et al: Technetium-99m Methylene Diphosphonate — A superior agent for skeletal imaging. Comparison with other Technetium complexes. J. Nucl Med 16:744, 1975

di

diagnostic isotopes incorporated

225 Belleville Avenue, Bloomfield, NJ 07003
Toll free (800)631-1260, (201)429-7590, Telex 133393 Diagnostic BLFD

See Opposite Page For Summary Of Prescribing Information

DIAGNOSTIC ISOTOPES
MDP KIT
TECHNETIUM Tc 99m MEDRONATE KIT

DIAGNOSTIC

DESCRIPTION

Each kit contains 10 vials, with each vial containing medronic acid, stannous chloride, and ascorbic acid. The 10 ml vial contains 10 mg of medronic acid, 0.17 mg (minimum) stannous chloride (maximum stannous and stannic chloride 0.29 mg), and 2 mg ascorbic acid. The contents of the vial are sterile, pyrogen-free, and lyophilized and sealed under nitrogen. The pH has been adjusted to 4-8 with hydrochloric acid and/or sodium hydroxide.

Administration is by intravenous injection for diagnostic use, after reconstitution with sodium pertechnetate Tc 99m Injection. The product as supplied is sterile and pyrogen-free.

The precise structure of stannous technetium-medronate complex is unknown at this time.

RADIATION DOSIMETRY

The effective half-life was assumed to be the physical half-life for all calculated values. About 50% of each dose of Technetium Tc 99m Medronate is retained in skeleton, and about 50% is excreted into the bladder. The estimated absorbed dose to an average patient (70 kg) from an intravenous injection of a maximum dose of 20 millicuries of Technetium Tc 99m Medronate are shown in Table IV.

Table IV

Absorbed Radiation Dose

Organ		*(rads/20 mCi)*
Total Body		0.13
Bone Total		0.70
Red Marrow		0.56
Kidneys		0.80
Liver		0.06
Bladder Wall	2 hr void	2.60
	4.8 hr void	6.20
Ovaries	2 hr void	0.24
	4.8 hr void	0.34
Testes	2 hr void	0.16
	4.8 hr void	0.22

Method of calculation: A Schema for Absorbed-Dose Calculations for Biologically Distributed Radionuclides, Supplement No. 1, MIRD Pamphlet No. 1, p. 7, 1968.

CLINICAL PHARMACOLOGY

Following intravenous administration of Technetium Tc 99m Medronate, skeletal uptake occurs as a function of blood flow to bone and bone efficiency in extracting the complex. Bone mineral crystals are generally considered to be hydroxyapatite, and the complex appears to have an affinity for the hydroxyapatite crystals in bone.

Clearance of the complex from blood is rapid following intravenous administration. Up to 50% of the injected dose is usually cleared by urinary excretion within the first 3-6 hours. Bone uptake is usually 40-50% within 3 hours following intravenous administration.

INDICATIONS AND USAGE

Technetium Tc 99m Medronate may be used as a bone imaging agent to delineate areas of altered osteogenesis.

CONTRAINDICATIONS

None known.

WARNINGS

This class of compound is known to complex cations such as calcium. Particular caution should be used with patients who have, or who may be predisposed to, hypocalcemia (i.e., alkalosis).

This radiopharmaceutical drug product should not be administered to children, to pregnant women, or to nursing mothers, unless the expected benefit to be gained outweighs the potential risk.

Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

PRECAUTIONS

General

Technetium Tc 99m Medronate as well as other radioactive drugs, must be handled with care and appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Also, care should be taken to minimize radiation exposure to the patients consistent with proper patient management.

To minimize radiation dose to the bladder, the patient should be encouraged to void when the examination is completed and as often thereafter as possible for the next 4-6 hours.

This preparation contains no bacteriostatic preservative.

Technetium Tc 99m Medronate should be formulated within six (6) hours prior to clinical use.

Pregnancy Category C

Adequate reproductive studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m Medronate should be used in pregnant women only when clearly needed.

Nursing Mothers

It is not known whether this drug is excreted in human milk. As a general rule nursing should not be undertaken while a patient is on the drug since many drugs are excreted in human milk.

Pediatric Use

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

No adverse reactions specifically attributable to the use of Technetium Tc 99m Medronate have been reported.

DOSAGE AND ADMINISTRATION

The suggested dose range for i.v. administration, after reconstitution with oxidant-free sodium pertechnetate Tc 99m Injection, to be employed in the average patient (70 kg) is:

Bone imaging: 10-20 mCi Technetium Tc 99m Medronate

Scanning post-injection is optimal at about 1-4 hours.

Slow administration of the drug over a period of 30 seconds is recommended.

The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the safe use and handling of radionuclides and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

HOW SUPPLIED

Diagnostic Isotopes' Technetium Tc 99m Medronate Kit is supplied as a sterile, pyrogen-free kit containing 10 vials.

Each 10 ml vial contains 10 mg medronic acid, 0.17 mg (minimum) stannous chloride (maximum stannous and stannic chloride 0.29 mg), and 2 mg ascorbic acid. The pH has been adjusted to 4-8 with either HCl or NaOH prior to lyophilization. Following lyophilization, the vials are sealed under a nitrogen atmosphere.

diagnostic isotopes incorporated
225 belleville ave./bloomfield, n.j. 07003

Brief summary of prescribing information. See package insert for full disclosure.

^{125}I METHOTREXATE RADIOIMMUNOASSAY KIT

Our ^{125}I Methotrexate Radioimmunoassay Kit provides a rapid, simple method with an unexcelled level of sensitivity and specificity.

Here is a comparison chart that speaks for itself.

Select the proven DBI ^{125}I MTX-RIA kit to monitor the circulating methotrexate levels in serum, plasma, cerebral spinal fluid or urine.

Also available:

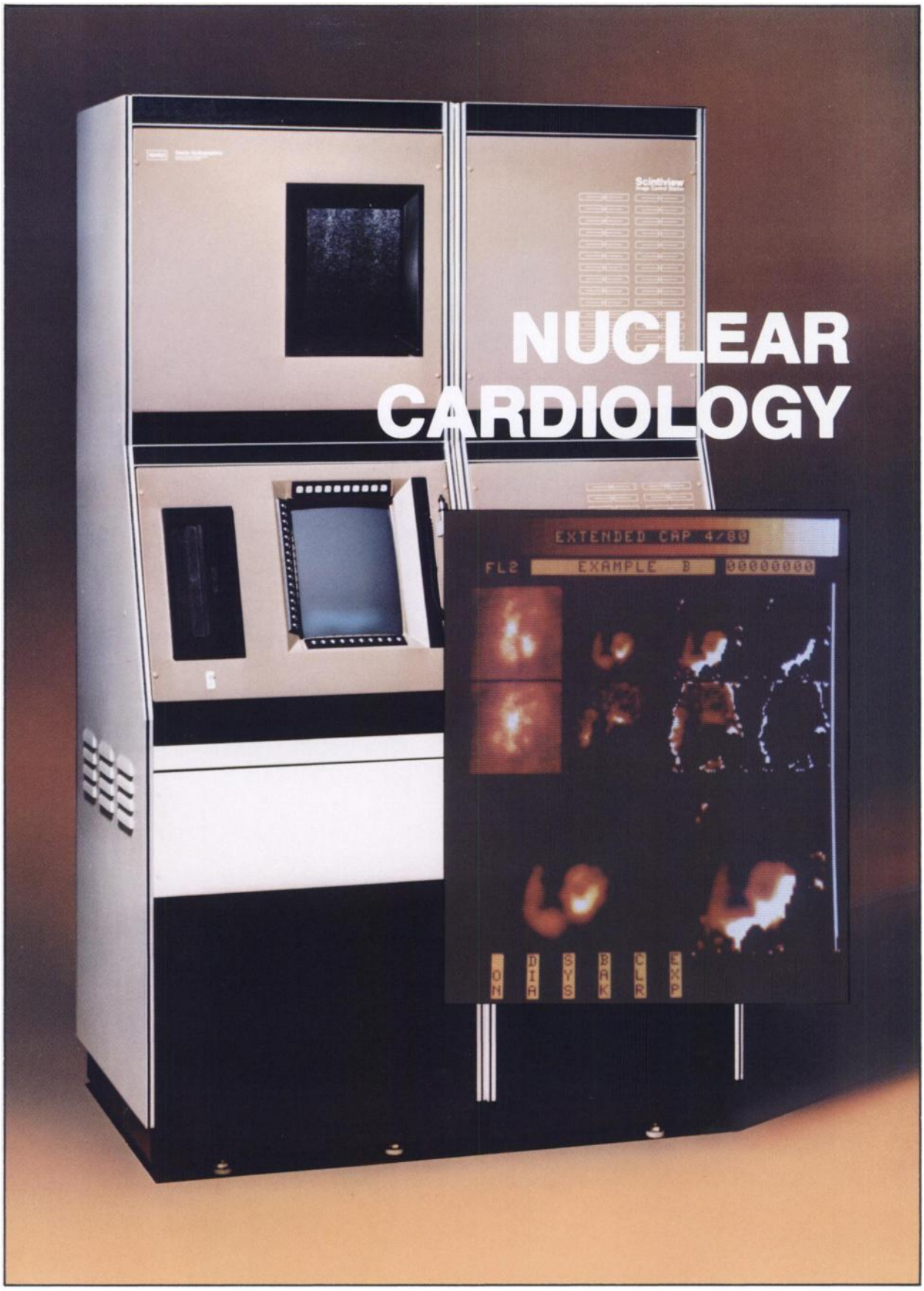
^{125}I Doxorubicin-RIA Kit
^{125}I Digoxin-Stat-RIA Kit
^{125}I Folate Kit
^{125}I T_4-One Step-RIA Kit
^{125}I T_3-Uptake Kit

Call or write for our low priced introductory kit.

	DBI RADIOIMMUNOASSAY	IMMUNOENZYME ASSAY
STAT INCUBATION:	15 minutes at 37°C	1 minute
SENSITIVITY:	0.0004 μM (700 times more sensitive)	0.3 μM
EXOGENOUS INTERFERENCE:	None	Lypemic Icterus Hemolysis
STANDARDS SUPPLIED:	7	6
PRICE:	*57½ cents per tube	$1.86 per tube

*In units of 200

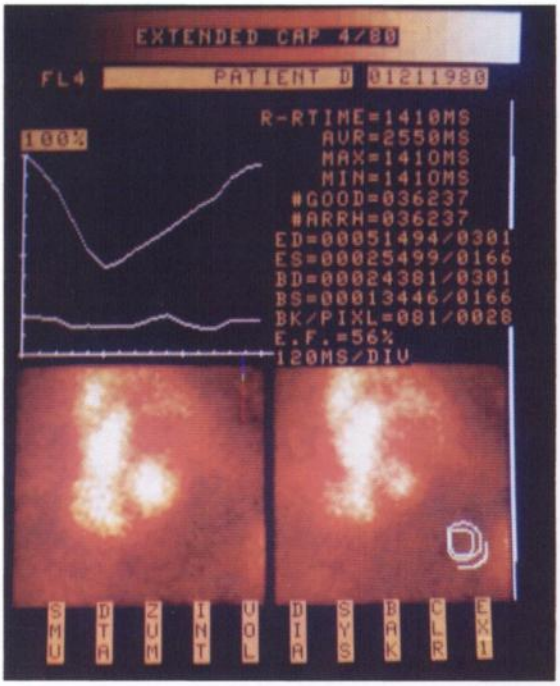
Diagnostic Biochemistry Inc.
10457-H Roselle Street, San Diego, CA 92121
Tel. (714) 452-0950



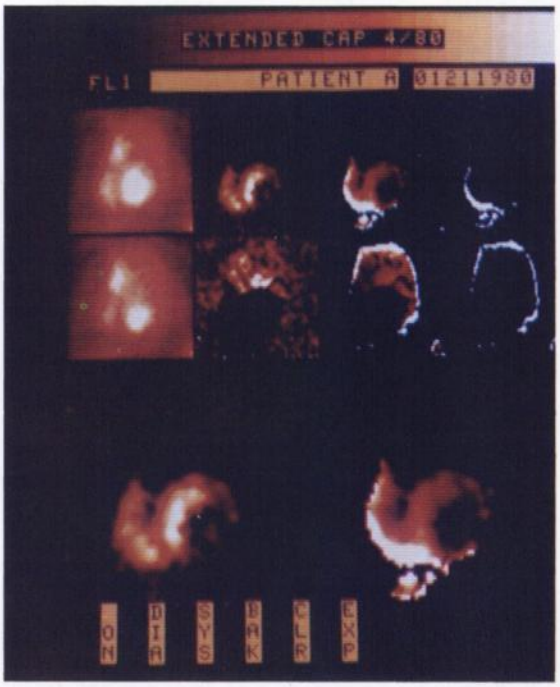
A HISTORY OF PERFORMANCE... A COMMITMENT TO THE FUTURE.

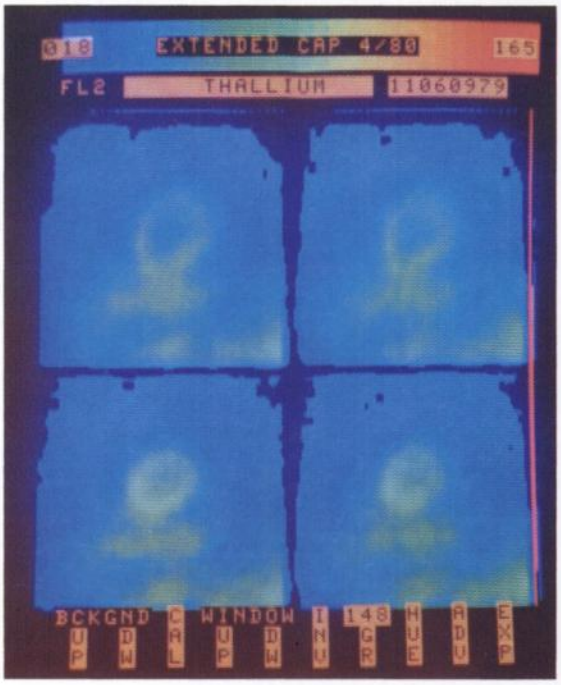
SIEMENS

Multi-gated blood pool studies can be acquired in either single or sequential modes with the ejection fraction data displayed for one study or up to eight stress or intervention studies at once.

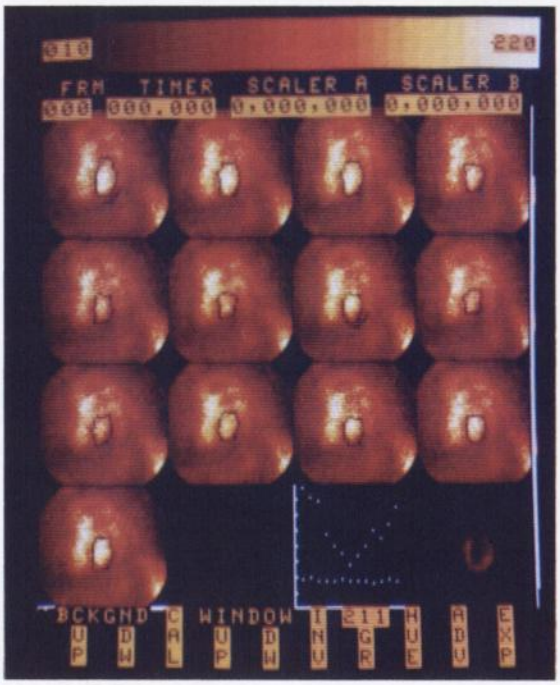


Regional wall motion changes within the heart can be displayed through "stroke volume" and "ejection fraction" images. Additionally paradox images enhance the diagnosis of dyskinetic myocardial segments for complete cardiac analysis.





A gated 128 by 128 mode reduces motion blur in myocardial images without significantly prolonging study time.



The ACAP Program provides an automated wall detection method for outlining left ventricular borders and provides accurate, reproducible left ventricular ejection fractions.

"EJECTION FRACTION CALCULATION START TO STOP IN 3 MINUTES OR LESS (ECAP)"

Ejection fraction processing takes 3 minutes or less using Scintiview's™ microprocessor based electronics, English language pushbutton operation and ECAP (Extended Cardiac Analysis Package).

ECAP features extended wall motion analysis via "stroke volume", "ejection fraction" and "paradox" images, 128 x 128 gated acquisition for myocardial images, and sequential acquisition and processing "batch" of multi-gated blood pool studies.

"DEFINE LEFT VENTRICULAR BORDER WITHOUT OPERATOR INTERVENTION (ACAP)"

ACAP, the third in a series of new cardiac performance packages, provides complete and automatic definition of the left ventricular border in each frame of a multi-gated study, without operator intervention. ACAP also includes all of ECAP's features.

Acquisition and Processing Features

Operator selection of study termination parameters (memory full, time). For intervention studies, up to eight sequential multi-gated blood pool studies may be acquired. Rapid analysis of ventricular parameters can be obtained conveniently by use of lite pen or automatically via an advanced edge detection algorithm requiring little or no operator intervention. Storage of R-R time intervals, ejection fraction data, volume curve and regions of interest is permitted.

Myocardial Gated Imagery

Stop action viewing of technetium pyrophosphate infarct images or Thallium-201 perfusion images is provided in a 128 x 128 matrix. 100 millisecond time intervals provide motion deblurring without excessively prolonged study time. Thallium-201 four frame 128 x 128 gated images may be displayed in cine mode for visualization of myocardial thickening.

Extended Wall Motion Analysis

Display of regional volume changes on a pixel by pixel basis is provided in a static gray scale format via "functional" images. Analysis of dyskinetic wall motion is obtained by use of the "paradox" image. Overlap of the diastolic and systolic borders over the "stroke volume" image are possible to aid in ROI assignment over the left ventricle.

ECAP and ACAP are part of our commitment to nuclear cardiology. For complete information on ECAP, ACAP, and/or our line of nuclear cardiology products, Pho/Gamma* LEM*, Pho/Gamma SFOV and LFOV™, Pho/Con*, Gamma/Cor*, Slant Hole Collimator, or Image Magnifier-Rotator, call or write today.

SIEMENS GAMMASONICS, INC.
Nuclear Medical Division
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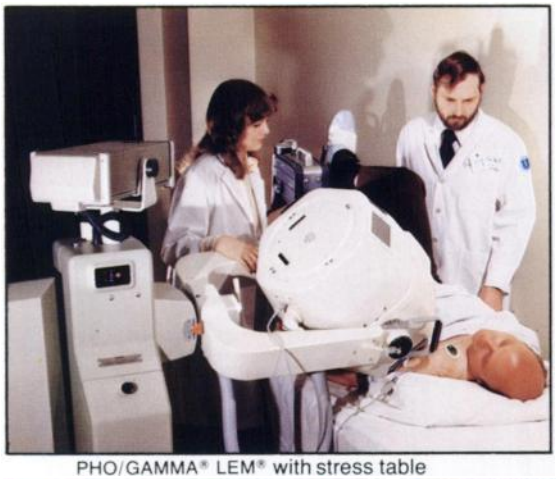
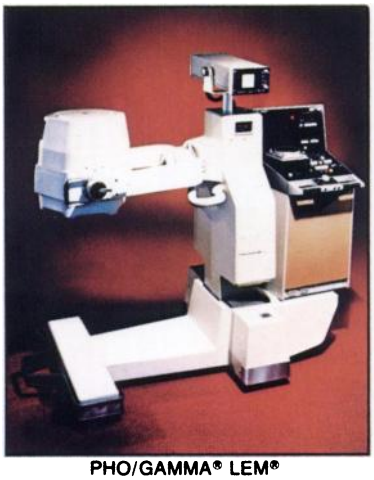
Des Plaines, IL 60018
Telephone 312/635-3100

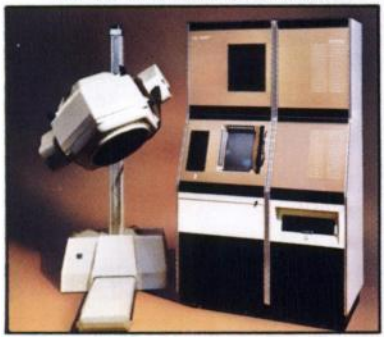


PHO/GAMMA® LEM® with stress table

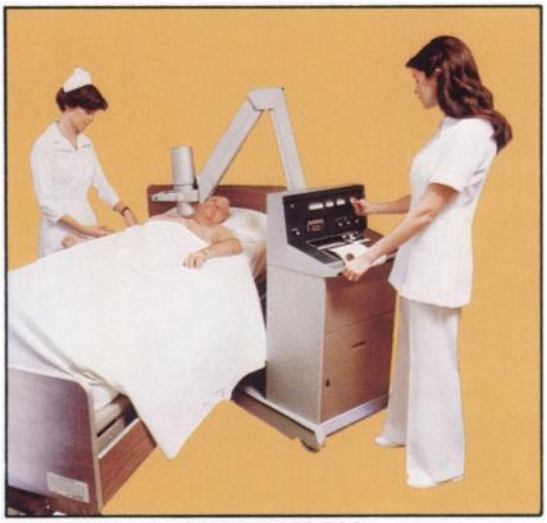


PHO/GAMMA® LEM®

IMAGE MAGNIFIER/ROTATOR



PHO/GAMMA® LFOV™



GAMMA/COR® RCG

The Pho/Gamma® LEM Scintillation Camera provides high resolution, high count rate nuclear medicine imaging capability at the patient's bedside. The LEM is available with power assist or optional power drive and is suitable for mobile applications or use in stationary settings such as in stress testing laboratories.

The Image Magnifier/Rotator allows magnification (up to 2.75 times normal size) of camera data prior to digitizing and display. Magnification aids in visualizing small organs imaged with a large field of view camera. The Image Rotator provides 360° rotation of camera data to allow operator chosen orientation of clinical studies.

The Pho/Gamma® LFOV™ Scintillation Camera is a high performance LFOV Detector, integrated with a microprocessor-based Standard Console (Scintiview™ with Micro Dot Imager™) that provides cardiac analysis and processing with optional ECAP and ACAP programs.

ZLC provides uniformity and linearity correction in a manner which will not distort quantitative camera data. The demanding camera requirements necessary to perform quantitative nuclear cardiology are met with ZLC.

The Gamma/Cor®RCG is a lightweight, highly mobile cardiac system which offers a unique direct method for rapid, repeatable assessment of left ventricular ejection fraction in a minimally invasive, safe manner right at the patient's bedside. The Gamma/Cor also provides assessment of other cardiac parameters such as cardiac output.

A HISTORY OF PERFORMANCE... A COMMITMENT TO THE FUTURE.

SIEMENS

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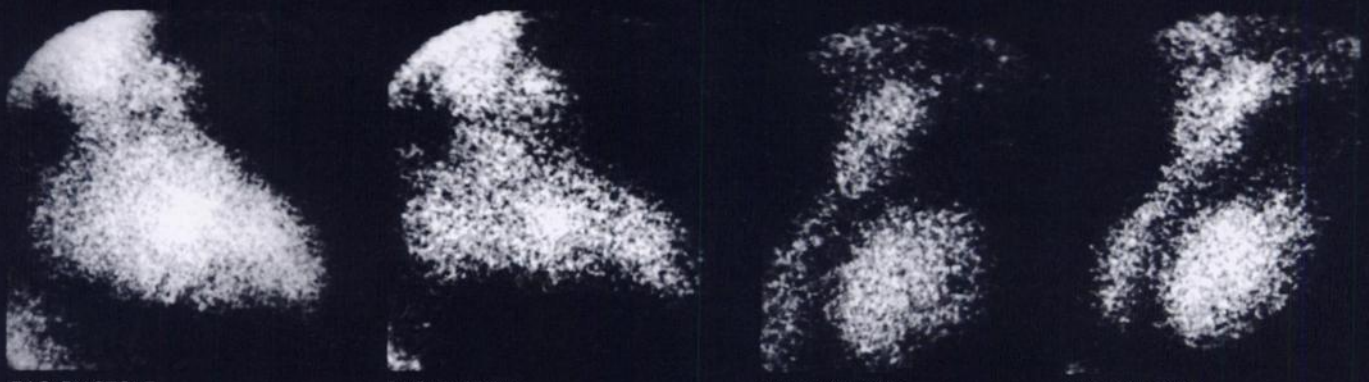
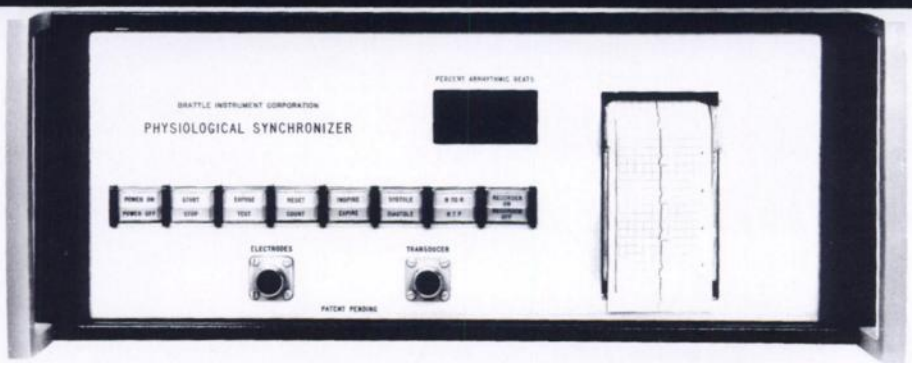
Help your cardiologist study heart kinetics non-invasively with Brattle-gated scintiphotos.



RAO. DIASTOLE | RAO. SYSTOLE | LAO. DIASTOLE | LAO. SYSTOLE

The RAO view shows akinesis of the lower antero-lateral wall and apex; and contraction of the inferior wall and high up the antero-lateral wall. The LAO view shows good contraction posteriorly and akinesis of the septal aspect of the chamber. Patient was injected IV with 20mCi of ^{99m}Tc-labelled Human Serum Albumin. The agent was prepared using the New England Nuclear Electrolysis Kit for labelling HSA. Write or call for a portfolio of Brattle-gated lung, liver and heart studies.



No knobs, no meters, no errors
The spartan panel above tells the second-best part of our story. If you want to photograph peak systole, press the SYSTOLE button. If, say, you want systole only at full expiration, press the EXPIRATION button as well. If only breathing is relevant, don't press the heart button.

The Brattle is connected to the patient and to your gamma (or x-ray or ultrasonic) camera. Whenever the patient is in the selected phase, both the scope and the scaler on your gamma camera are gated ON, and film is exposed. Otherwise, they are OFF.

Brattles lock onto patients—and stay locked on
It doesn't matter if the patient's heart rate and breathing depth change while he's under the collimator because we stay right with him. Brattles contain an ECG to track heart, a plethysmograph to track respiration, and a tiny computer to deduce systole and diastole times from the heart signal. And because it's all built in, your operator need not be a physiologist.

We don't cover our tracks—we print them
The panel lights flash whenever the patient reaches the selected phases; and pushing the RECORDER-ON button gets you an ECG tracing marked with breathing and camera-on times. You can verify function before, during and after exposure.

A single pair of axillary electrodes captures both heart and breath
It's easy. And we supply disposable, pre-filled electrodes.

Some Brattles have been in clinical use for over three years—in community and major hospitals
More than half of our instruments are in community hospitals and the list is growing rapidly. Upon request, we'll supply names of happy users in your area.

What's the next step? Get in touch
Ask your NEN man about Brattles and HSA Kits. He can show you a portfolio of clinical pictures and arrange to have one of our people give you a demo. Or write or call us direct. We'll send you brochures on this and other models, and will give you your own set of clinical pictures and a bibliography on gated scintigraphy. If you wish, we'll even make you a Brattle owner. (This is the best part of our story.)

Brattle Instrument Corporation

243 Vassar Street • Cambridge, Massachusetts 02139 • 617-661-0300