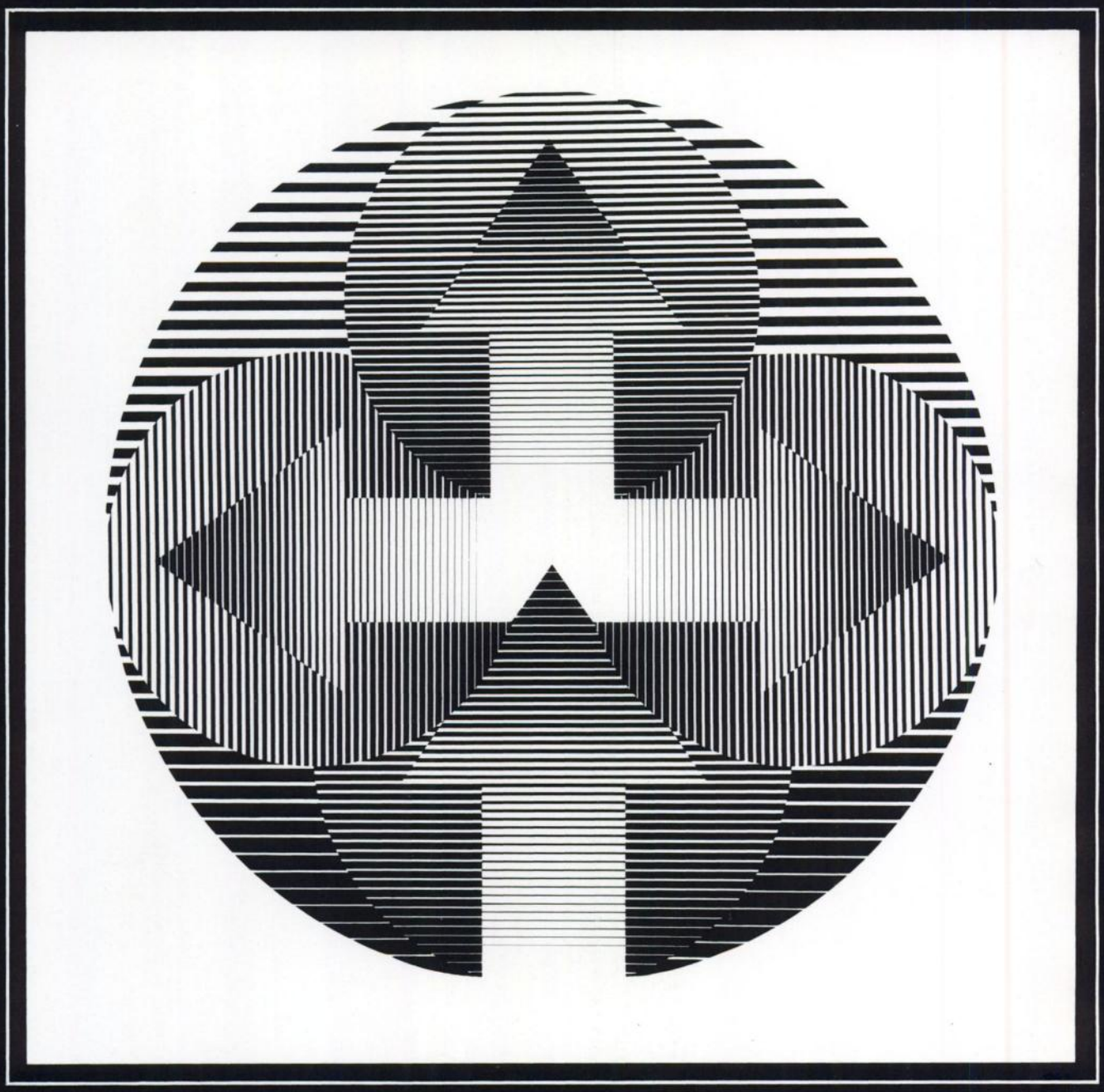
A Clinical Insight:

Indium 111 DTPA in Cisternography



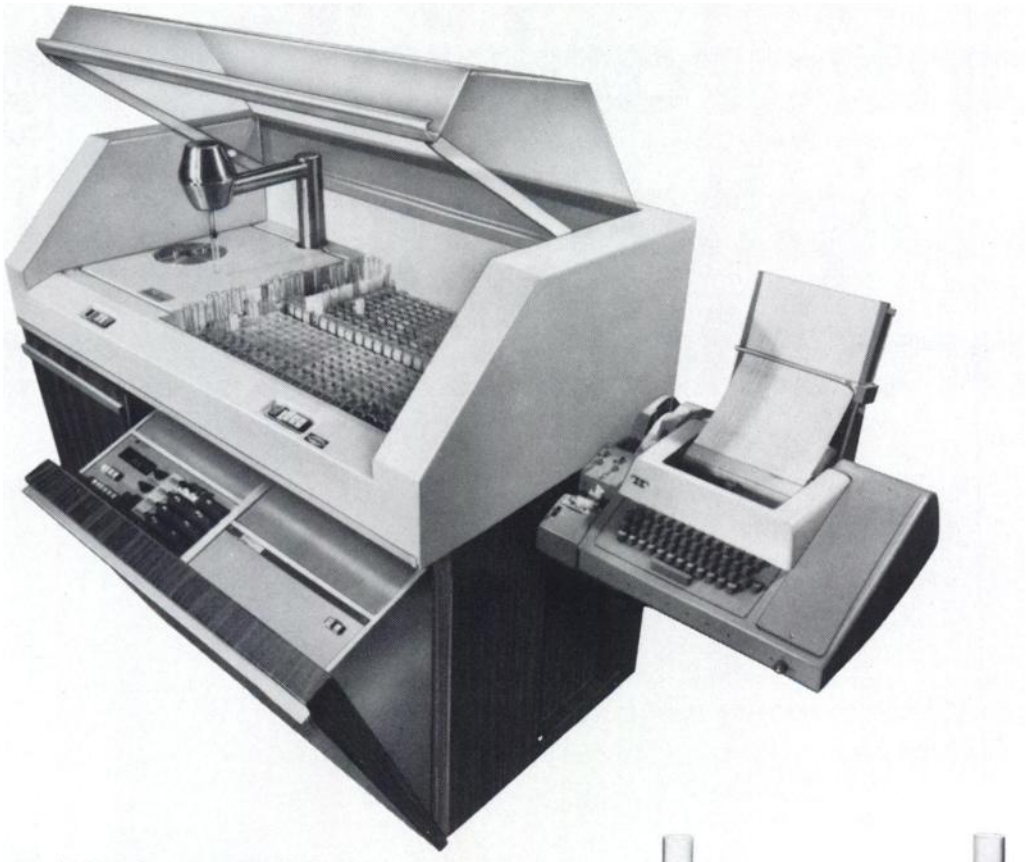
The criteria suggested by Hosain and Som for a cisternographic radioisotope are: (i) physiologically governed by CSF flow, (ii) adequate half-life for desirable period of study, (iii) photons suitable for scanning, (iv) low radiation dose, (v) least probable chemical toxicity, and (vi) controlled pharmaceutical quality.[1] Chelated ^{111}In DTPA by Medi + Physics is a sterile, pyrogen-free radiopharmaceutical in isotonic aqueous solution for use in the study of cerebrospinal fluid pathways. It has a radioactive half-life of 2.81 days. Its principal gamma emissions are 173 keV(89%) and 247 keV(94%). ^{111}In DTPA is a new drug limited by Federal law to investigational use. For information about clinical studies and licensure, call Medi + Physics toll free (800) 227-0483, or in California, (800) 772-2446. Or write: Medi + Physics 5855 Christie Ave, Emeryville, California 94608

[1]Hosain, F. and Som, P., Chelated ^{111}In: An ideal radiopharmaceutical for cisternography, *Brit. J. Radiol.* 45, 677 (Sept. 1972).

medi+physics

GammaSet 500

More than just a sample changer
A programmable multi-user system



The Raytheon/ICN GammaSet 500 adds a major new dimension to automatic gamma counters: The unique Programmable Sample Cassette. Each 10-sample cassette can be easily programmed for automatic selection of counting parameters and user identification. The cassette can be coded for preset time, preset count, background subtract, and isotope selection on the 4-mode, dual scaler. The cassette concept also makes system loading and unloading considerably faster.

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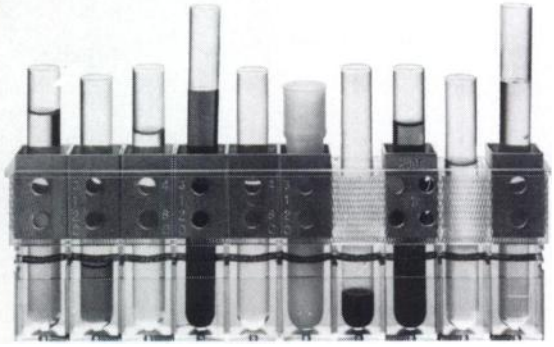

Multi-User Capability. Rapid loading, 500 sample capacity accommodates many different users with various test requirements. Cassettes can be loaded in random order and interrupted at any time for manual counting.

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For full details, write Raytheon Company, Medical Electronics, P.O. Box 397, Fourth Ave. Burlington, Mass. 01803
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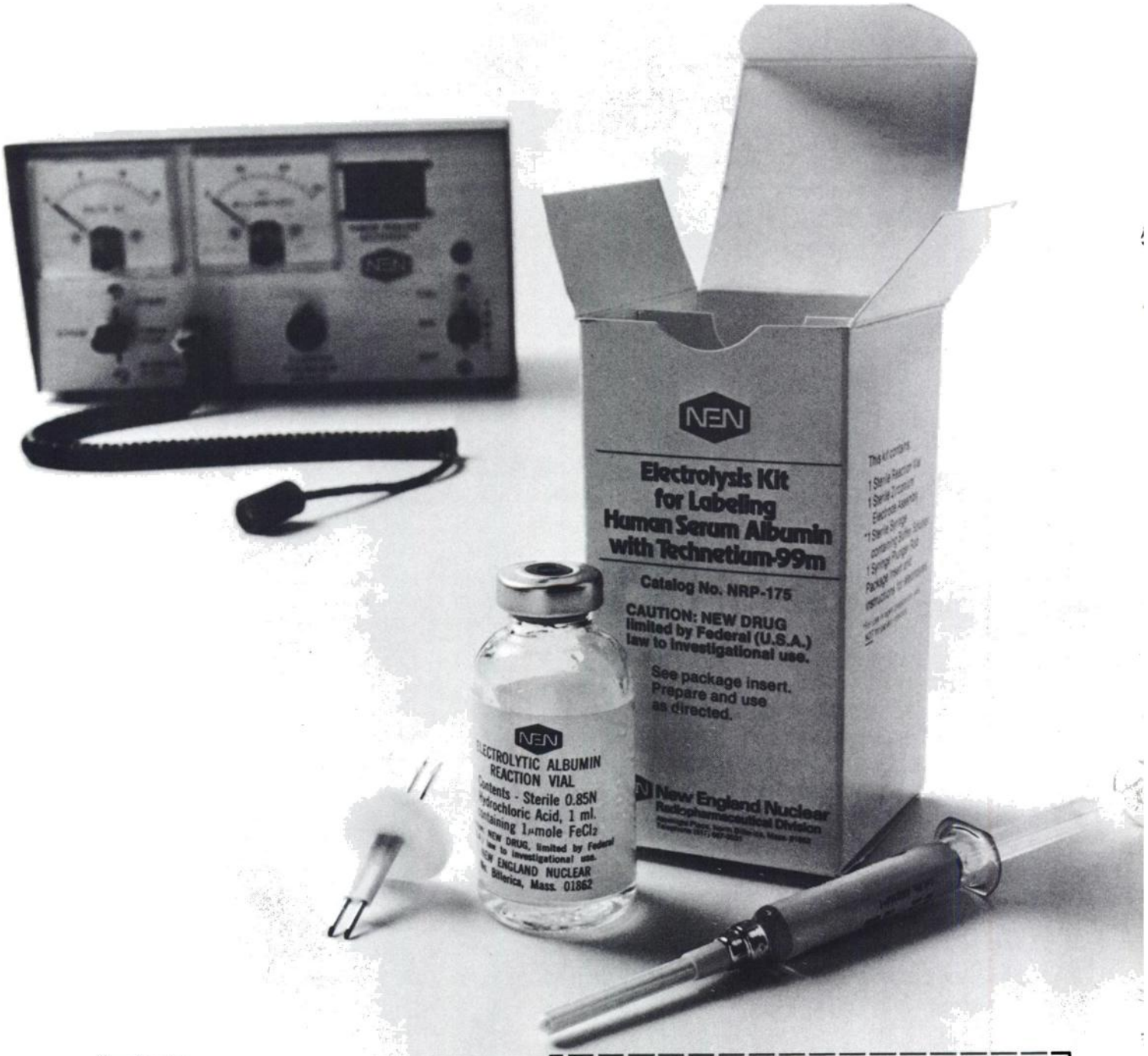
RAYTHEON

Electrolysis Kit for Labeling Human Serum Albumin with ^{99m}Tc



Contents:
1 sterile reaction vial
1 sterile zirconium electrode assembly
1 sterile syringe containing buffer solution
Human serum albumin not supplied.
Power supply available from NEN.

NEN New England Nuclear
Radiopharmaceutical Division
Atomlight Place, North Billerica, Mass. 01862
Telephone (617) 667-9531

Canada: NEN Canada Ltd., Dorval, Quebec, Tel: (514) 636-4971,
Telex: 05-821808
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• **Integral, yet Biodegradable**
Each Albumin Microsphere is a single homogeneous sphere of albumin — they won't disintegrate in the vial or syringe. Yet, microspheres readily clear from the lung. Pulmonary clearance half-times are long enough for multiple view imaging but are still short enough to allow daily imaging, if required. Microscopic analysis of lung tissue in the mouse showed 99 percent of the administered microspheres were gone after 29 hours.[1]

1. Data on file at the 3M Company and the Bureau of Biologics.

• **Eliminate Interference from "Free" Technetium**

"Free" isotope need no longer interfere with the scan. The unique filter construction of the Microsphere Labeling Vial allows the free isotope to be removed, leaving just labeled microspheres for suspension.

• **Stable Kit**
Currently the expiration date of each kit is *6 months* after the date of manufacture. You can stock the kit and have it available for immediate use. Even a department doing a moderate amount of lung imaging can take advantage of quantity discounts.

• **Each Lot FDA Approved**
Thoroughly tested by 3M, each lot is checked by the Bureau of Biologics, FDA, and approved for shipment. This provides a double-check of sterility, lack of pyrogens, and all the important performance parameters of the kit.

INDICATIONS Scintillation imaging of the lungs with ^{99m}Tc-Labeled Albumin Microspheres is indicated as an adjunct to other diagnostic procedures whenever information about pulmonary circulation is desired.

CONTRAINDICATIONS The safety of Albumin Microspheres in patients with a known right-to-left cardiac shunt has not been established and its use in such patients is contraindicated.

SIDE EFFECTS Although no anaphylactoid reactions have been reported in patients following the administration of Albumin Microspheres, the possibility should be considered that hypersensitivity reactions may occur rarely in patients who receive additional doses of the Microspheres.

HOW SUPPLIED Each kit contains five labeling units. Each labeling unit contains one day's supply of Albumin Microspheres (5mg — enough for 5 to 7 patients) plus all the reagents necessary to attach technetium to the microspheres.

For detailed information about Microspheres and the 3M Brand Albumin Microsphere ^{99m}Tc-Labeling Kit, write: **Nuclear Products for Medicine,** 3M Company, 3M Center, St. Paul, Minnesota 55101, or phone TOLL FREE (800) 328-1671.

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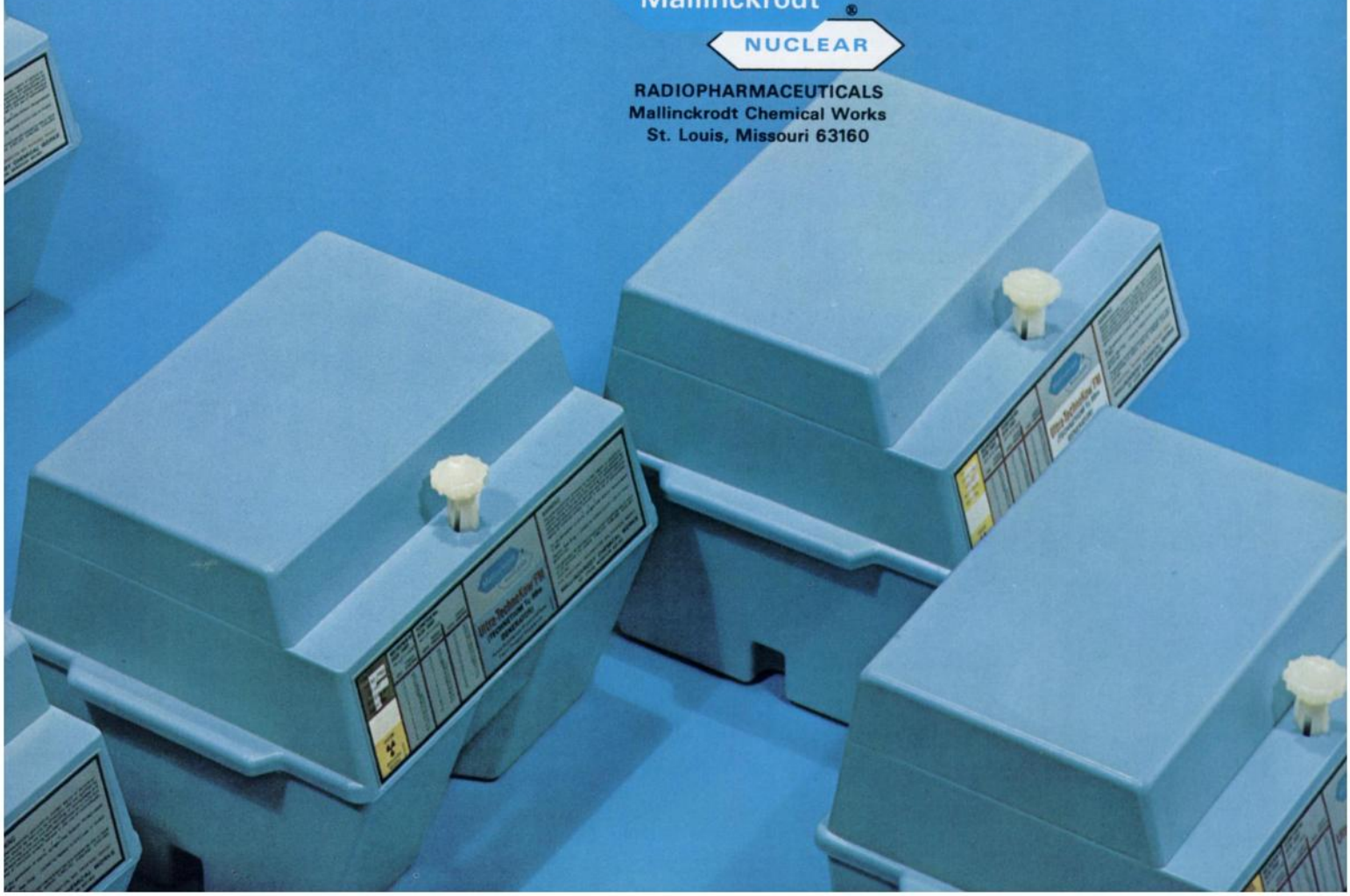

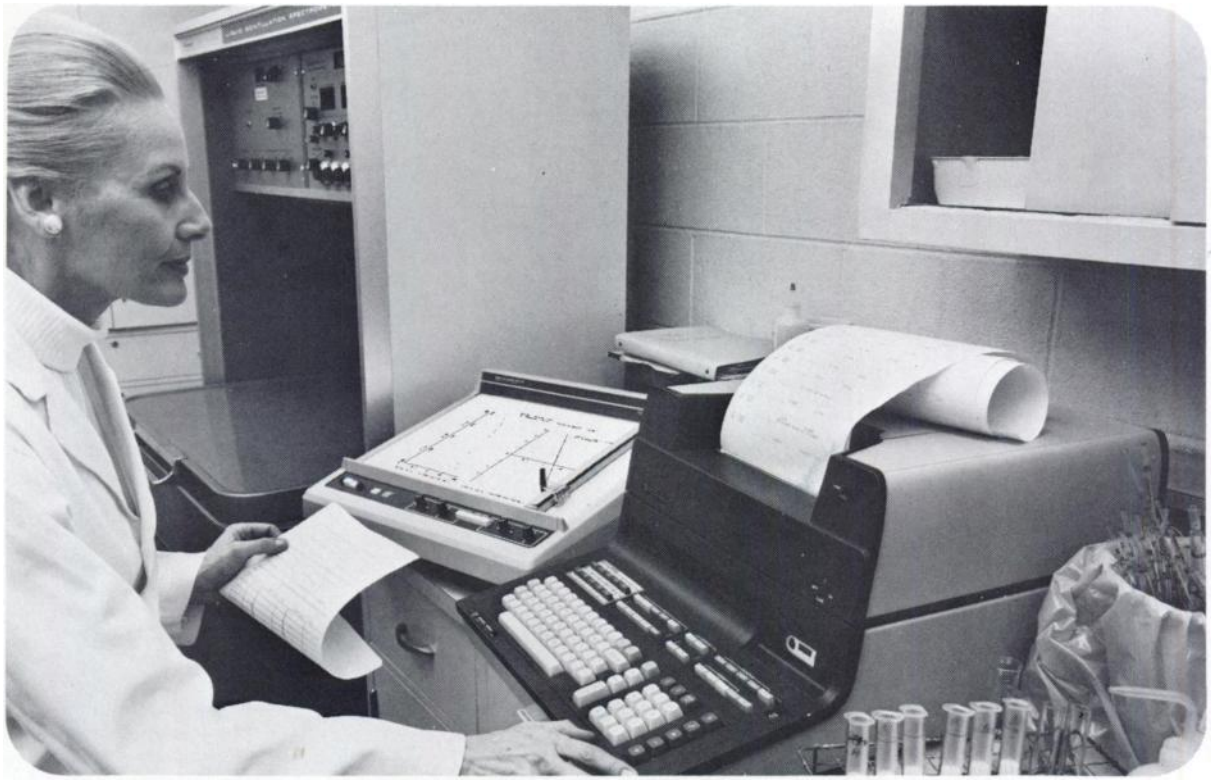

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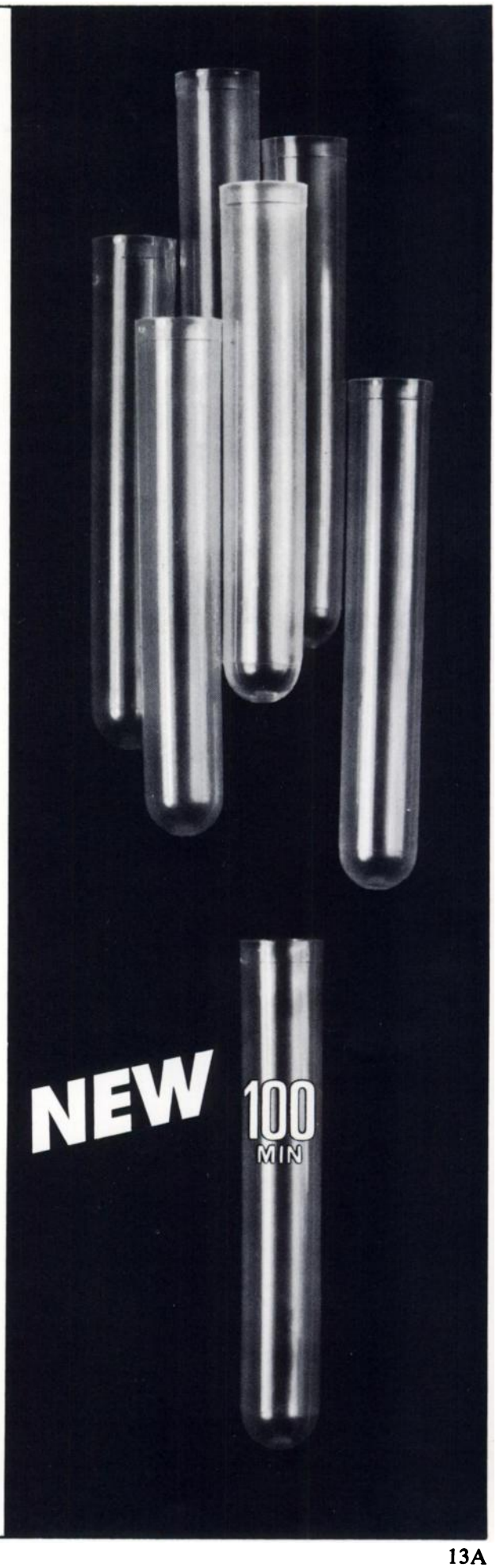

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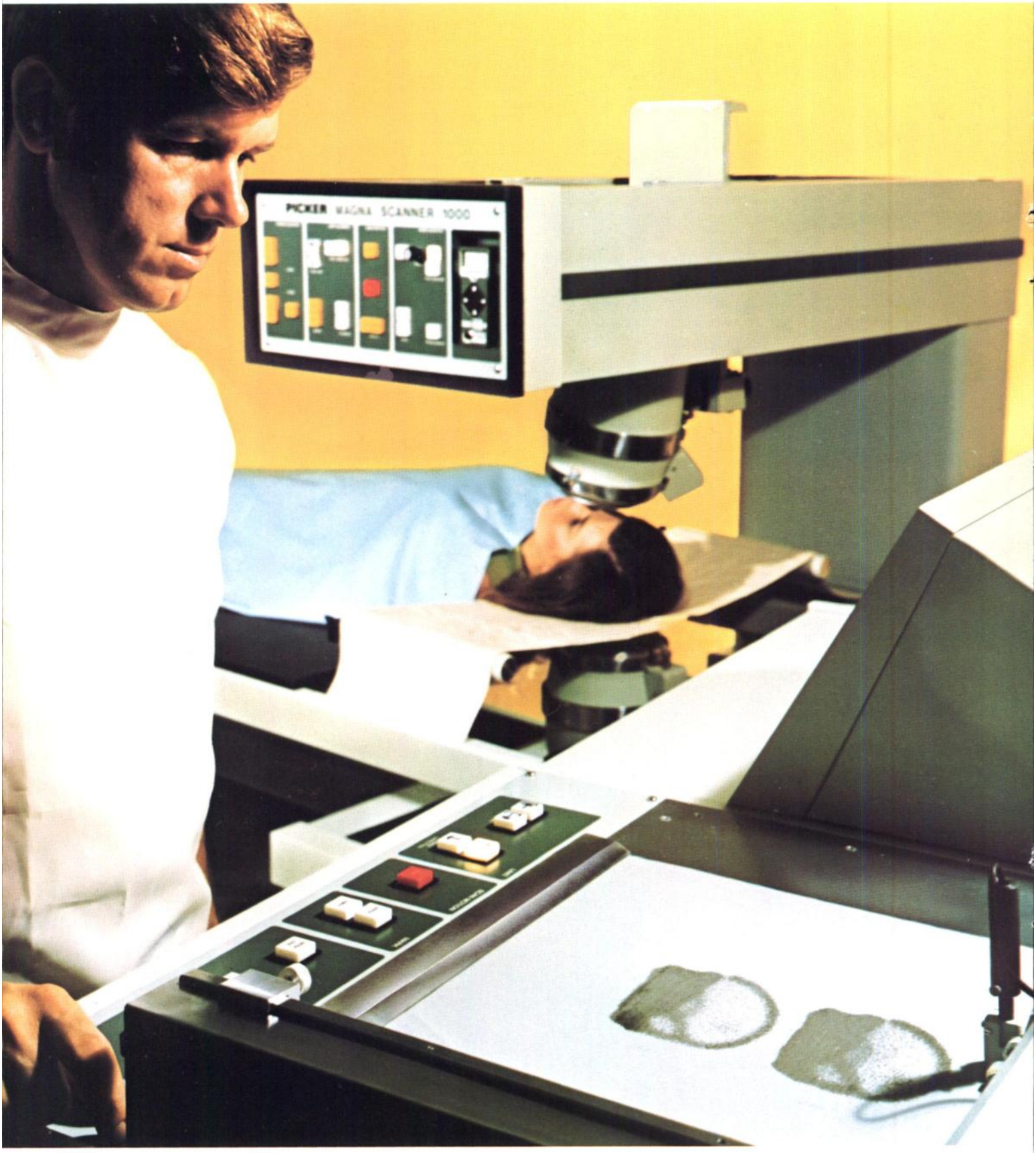

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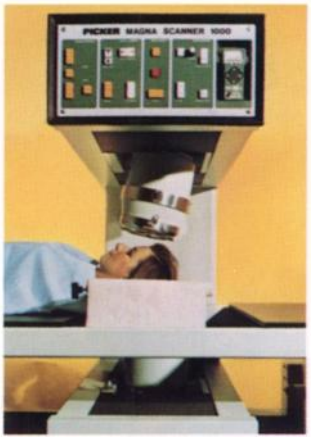

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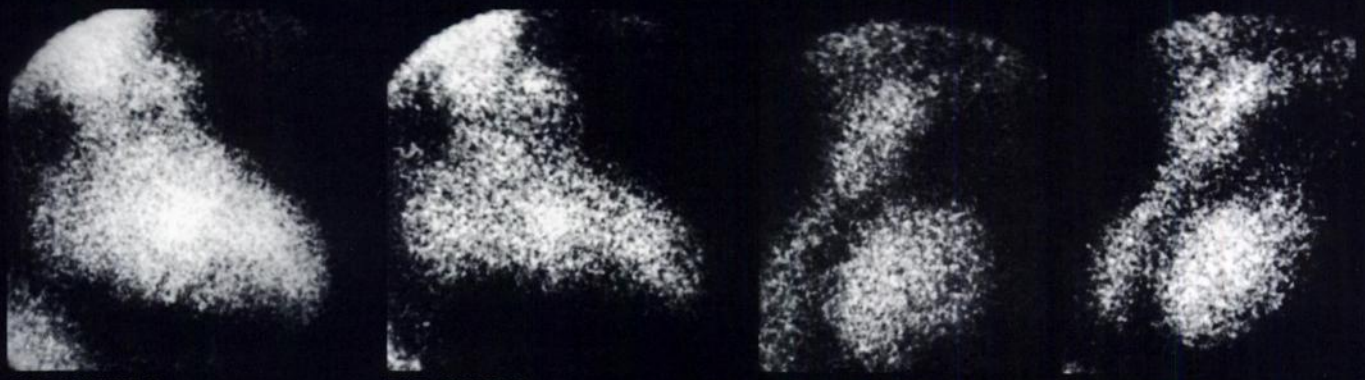
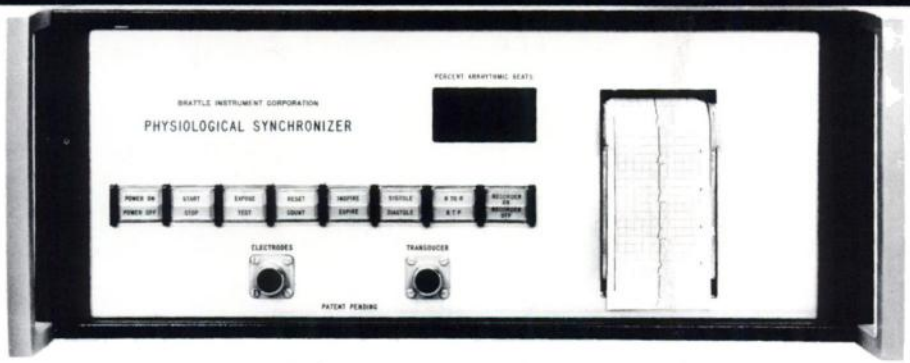


RAO, DIASTOLE | RAO, SYSTOLE | LAO, DIASTOLE | LAO, SYSTOLE

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. (Photos courtesy of Massachusetts General Hospital.) Write or call for a portfolio of Brattle-gated lung, liver and heart studies, and come see us at the San Diego show.



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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.

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A single pair of axillary electrodes captures both heart and breath
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What's the next step? Write or call
Yes, write us. Or call. We'll send you data (on this and other models, applications) and the name and phone of our man in your area (37 states so far, and growing). He can show you samples, give you a demo and arrange for you to have a machine of your own. (This is the best part of our story.)

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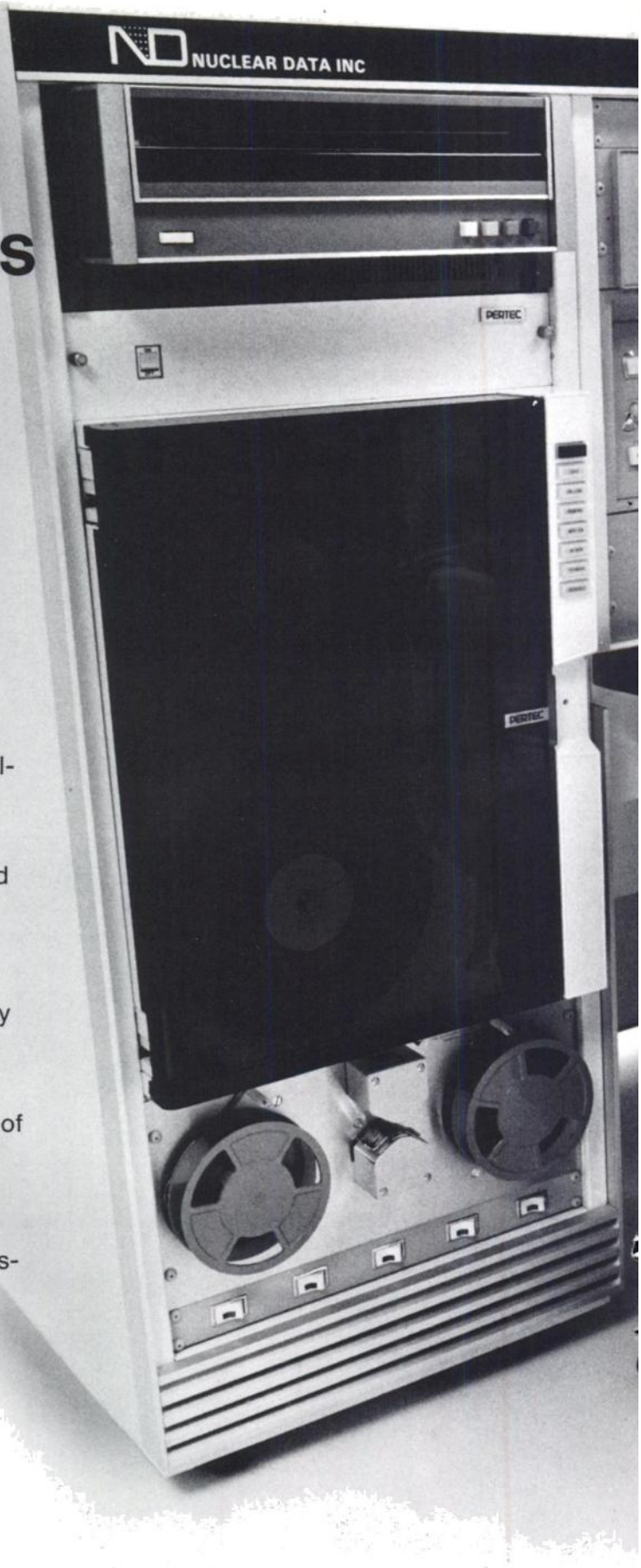

Fact: Nuclear Data has installed more such systems than all other companies *combined.*

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Fact: MED II has more clinical software actually available today. (See facing page.)

Fact: Nuclear Data supplies superior continuing field support and service.

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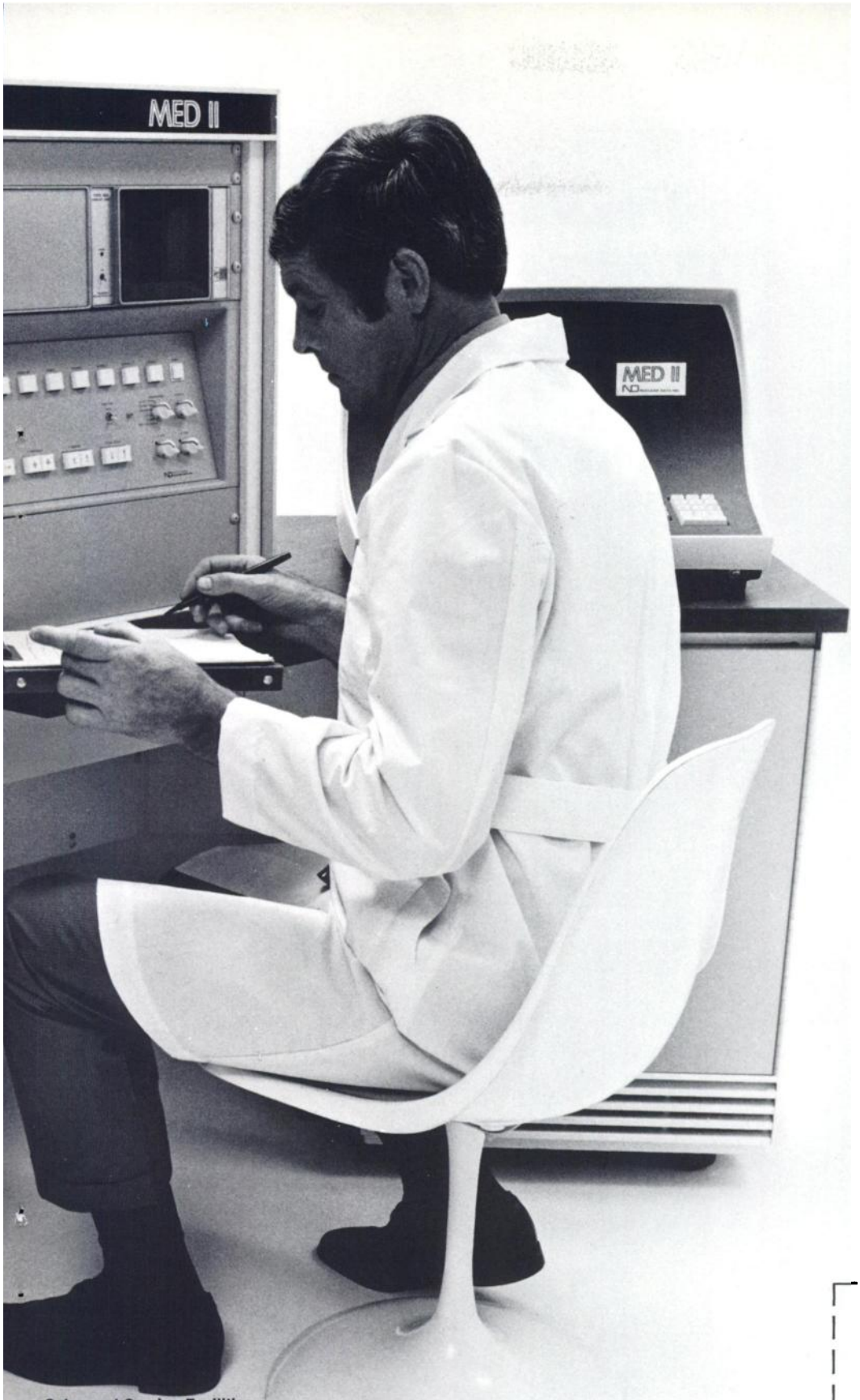
Fact: You ought to check out the MED II before choosing a computerized image processing and storage system.



Available Software

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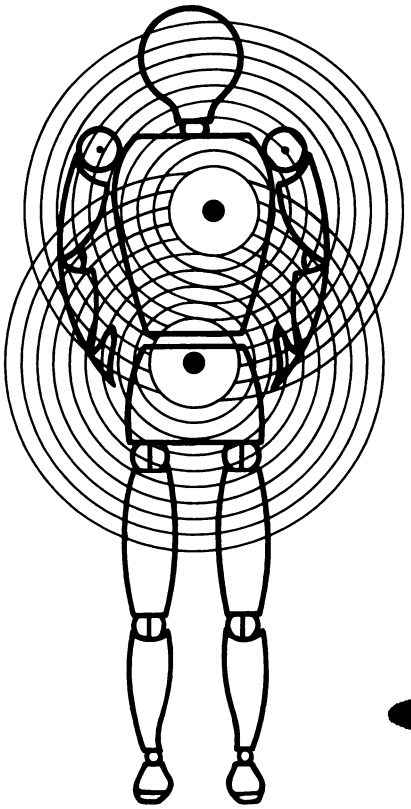

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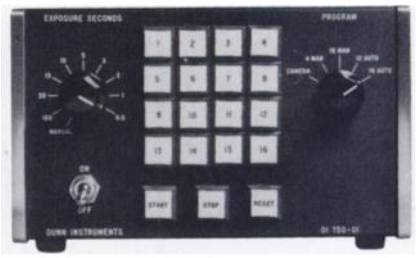

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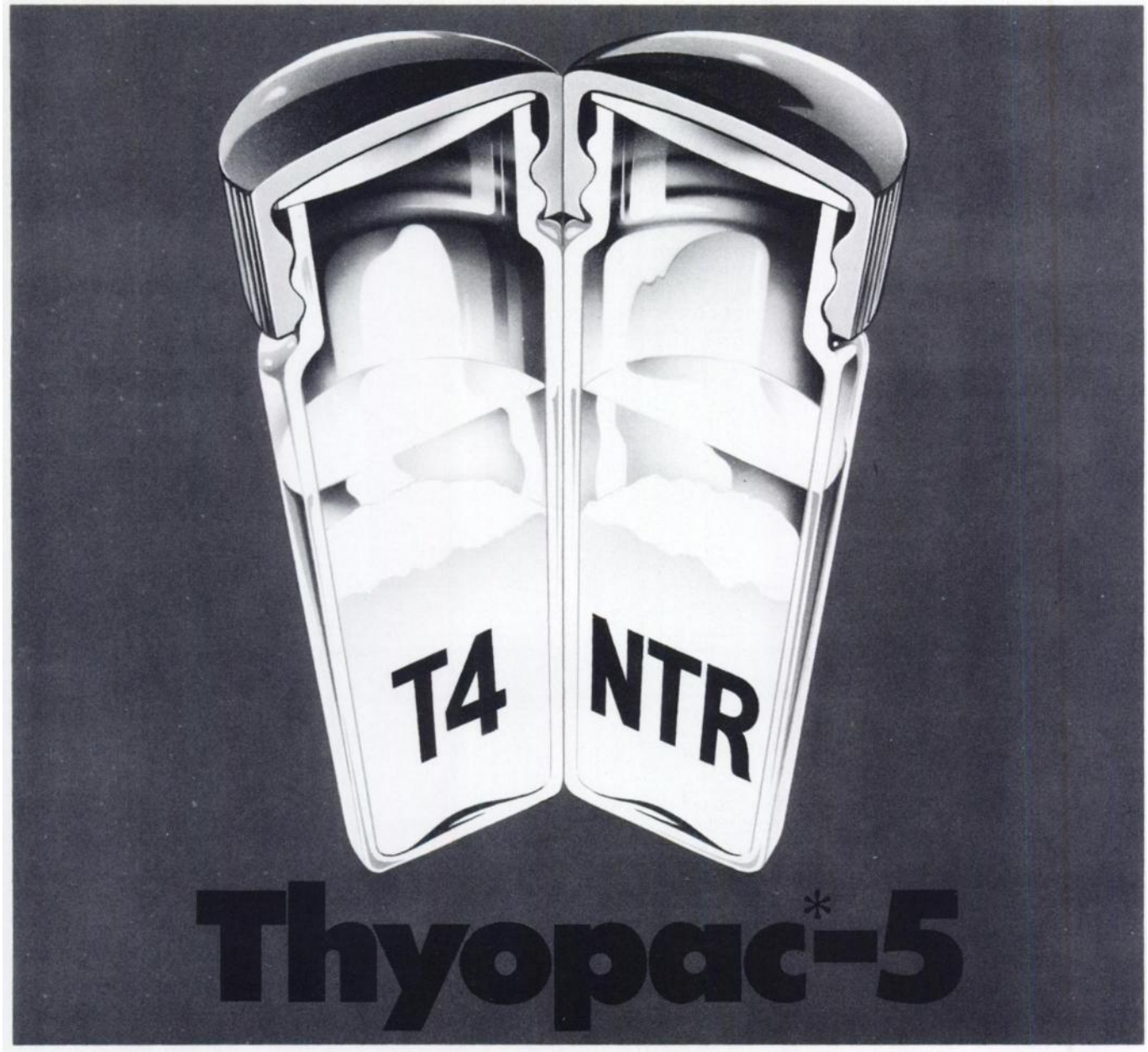

From one simple test, two important results.

New Thyopac-5 is the first screening test which enables pathologists to perform a normalized thyroxine ratio (NTR) and a total thyroxine assay (T4) in the same vial. It thus separates simply, rapidly and precisely those patients with definite thyroid abnormalities from those with no dysfunction. After screening, Thyopac-3 and Thyopac-4 can be used to provide a more detailed diagnostic picture. In patients with normal thyroid function, Thyopac-5 automatically corrects for abnormal binding capacity, whether caused by unrelated clinical conditions such as pregnancy, hypoproteinaemia, or by medication such as oral contraceptives.
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- two independent results from one test
- flexibility of choice: 3 assay sequences
- samples withdrawn at equilibrium
- independent of time and temperature

Thyopac*-5 a logical extension to thyroid function testing

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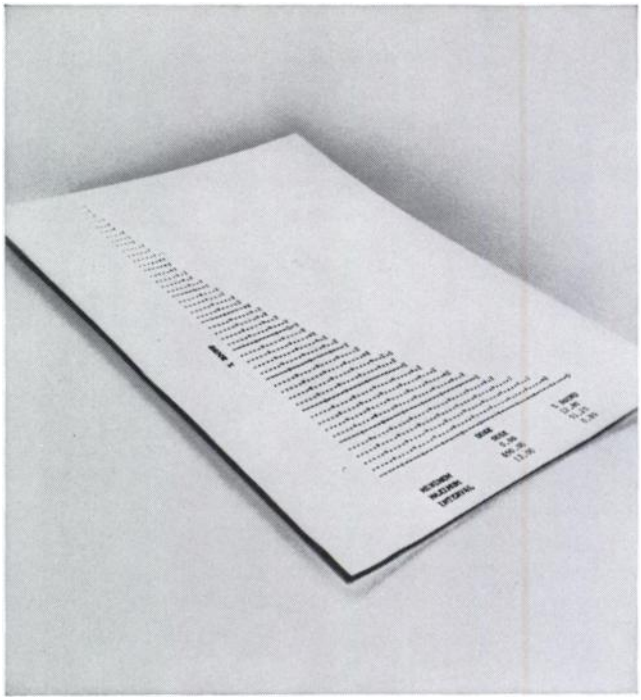

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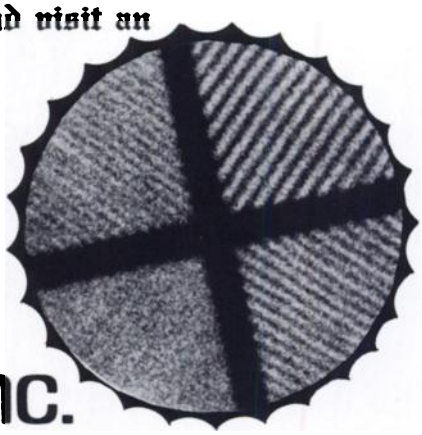

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NEW LIGHT

on the subject of ULTIMATE FATE

The controversy over long-term retention and biologic fate of Iron Hydroxide Macroaggregates for lung imaging has been put into realistic perspective in a recently published paper.* Clearly, the ultimate fate of FHMA has been more thoroughly studied than that of any other lung imaging agent. The findings shed new light on the predictable fate of FHMA.

We believe our FHMA makes the light brighter. Our FHMA is freeze dried. Its keeping qualities are far superior to those of other agents and tagging is comparable to MAA. It's safer and simpler to use than other FHMA agents. Preparation is quick, with less manipulation making it ideal for emergency situations.

Write for our descriptive literature and a copy of the Davis paper.

*M. A. Davis, "Long-term Retention and Biologic Fate of ^{99m}Tc-Iron Hydroxide Aggregates," presented at the Symposium on New Developments in Radiopharmaceuticals and Labelled Compounds sponsored by the International Atomic Energy Agency and World Health Organization at Copenhagen, Denmark on 26 to 30 March 1973.

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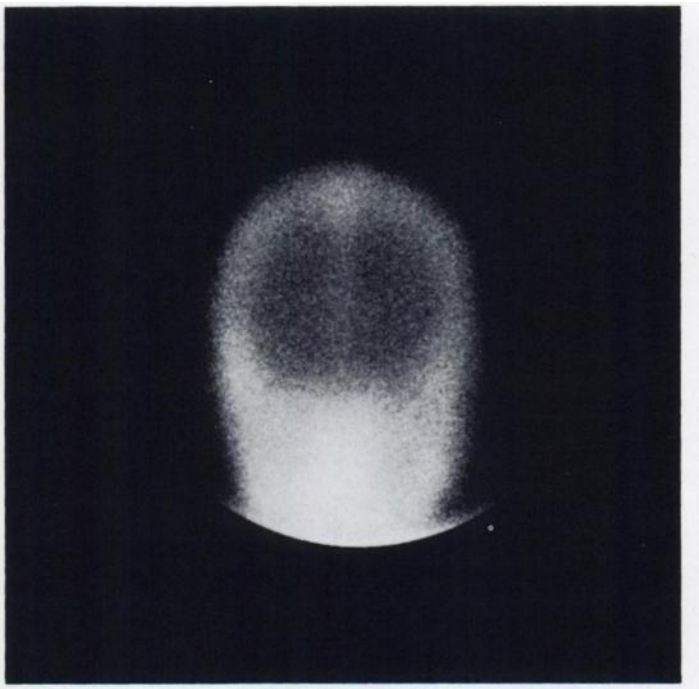
This static scan looks normal. The patient isn't.



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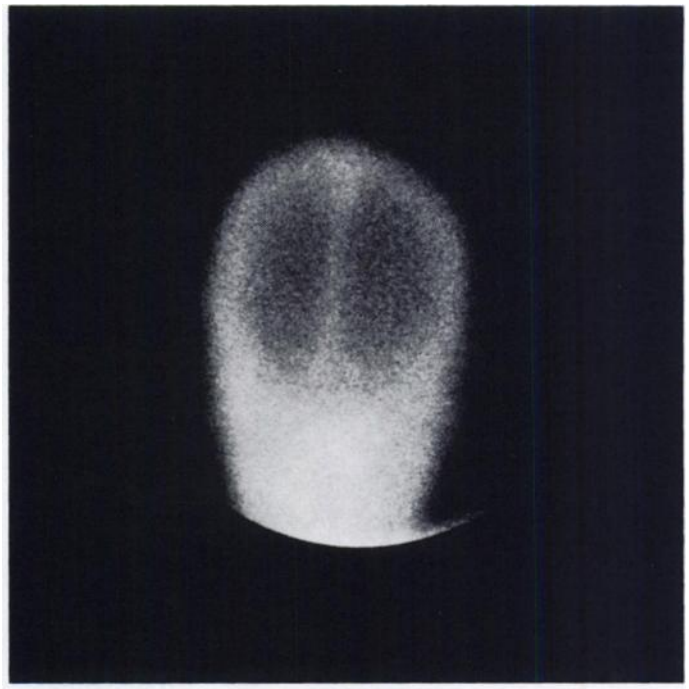

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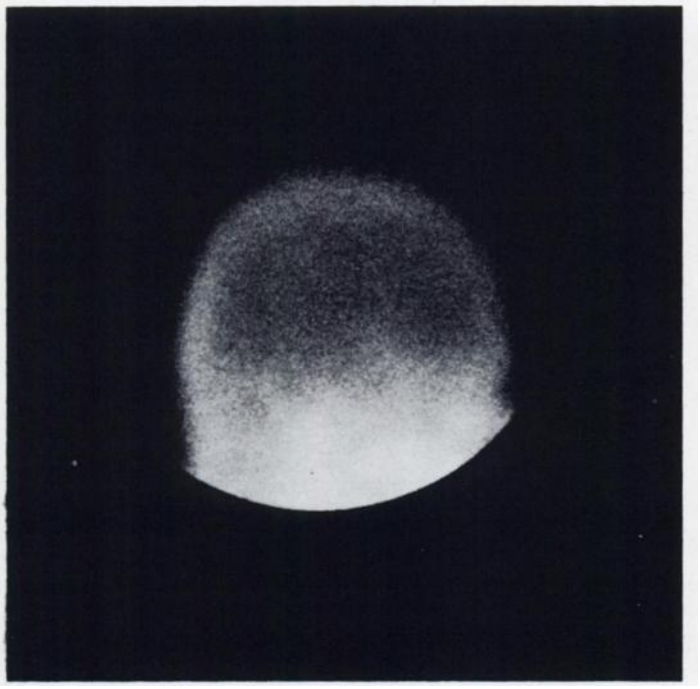

P RIGHT LAT A

A LEFT LAT P

The problems of qualitative evaluations of radioisotope distribution within the body have at last been solved. You can now link a scintillation camera to a Digital Equipment Corporation Gamma-11 computer for quantitative description of radionuclide flow.

In this system a cathode ray display is used for presentation of flow pattern data computed according to Region of Interest areas. These areas are indicated by means of a movable cursor (light spot) controlled from the keyboard. By relating pathological and clinical observations to this data, the physician can then establish significant differences in flow pattern and the areas in which they occur.

In the case study (left) of a right hemisphere space-occupying lesion, all static images show the distribution of radionuclide activity to be within normal limits. A quantitative Gamma-11 study using a series of 20 pictures, each containing two seconds of flow information, revealed, however, a difference of flow pattern between the left and right sides of the brain – a situation suggestive of a vascular lesion subsequently confirmed by a follow-up carotid angiogram.

Lung ventilation/perfusion studies, kidney perfusion and tubular functional studies, and left-to-right heart shunt studies are some of the many other diagnostic procedures for which the Gamma-11 is now being used.

Detection and quantitation of left-to-right shunts can be readily accomplished by analysis of time-activity curves generated from ROI's placed over the lung fields during radionuclide angiocardiography. This relatively simple diagnostic procedure (particularly suited for children) greatly reduces patient trauma by eliminating the need for cardiac catheterization. When carefully performed it allows clinical management of certain patients suspected of having left-to-right shunts. Because this method carries no risk, it can be repeated as often as required to assess the patient progress. This method provides pulmonary to systemic flow ratios (Qp/Qs) directly.

Besides quantitative evaluation of ROI curves, Gamma-11 performs such other functions as flood correction, thresholding and contrast enhancement, image smoothing and profile slices. All data acquisition and processing of gamma camera information is accommodated by a modular machine language operating system. FOCAL-PLUS, an easy-to-use, highly interactive programming language, allows direct user modification of image displays, i.e. ROI curve fitting, as well as applications extensions beyond the basic system.

For further information on the techniques of Gamma-11 quantitative analysis or on the features of this low-cost system and how they are being applied, write or call Digital Equipment Corporation, Maynard, Mass. 01754. (617) 897-5111, Ext. 2277. European headquarters: 81 route de l'Aire, 1211 Geneva 26. Tel: 42 79 50. Digital Equipment of Canada Ltd., P.O. Box 11500, Ottawa, Ontario K2H 8K8. (613) 592-5111.

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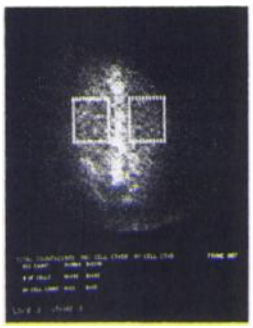
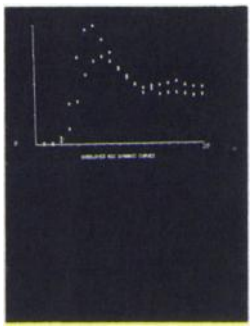
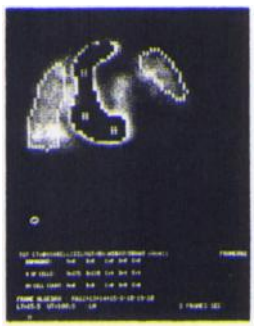


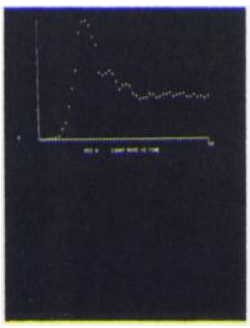
Composite of 1 frame/2 sec. flow study for ROI definition.



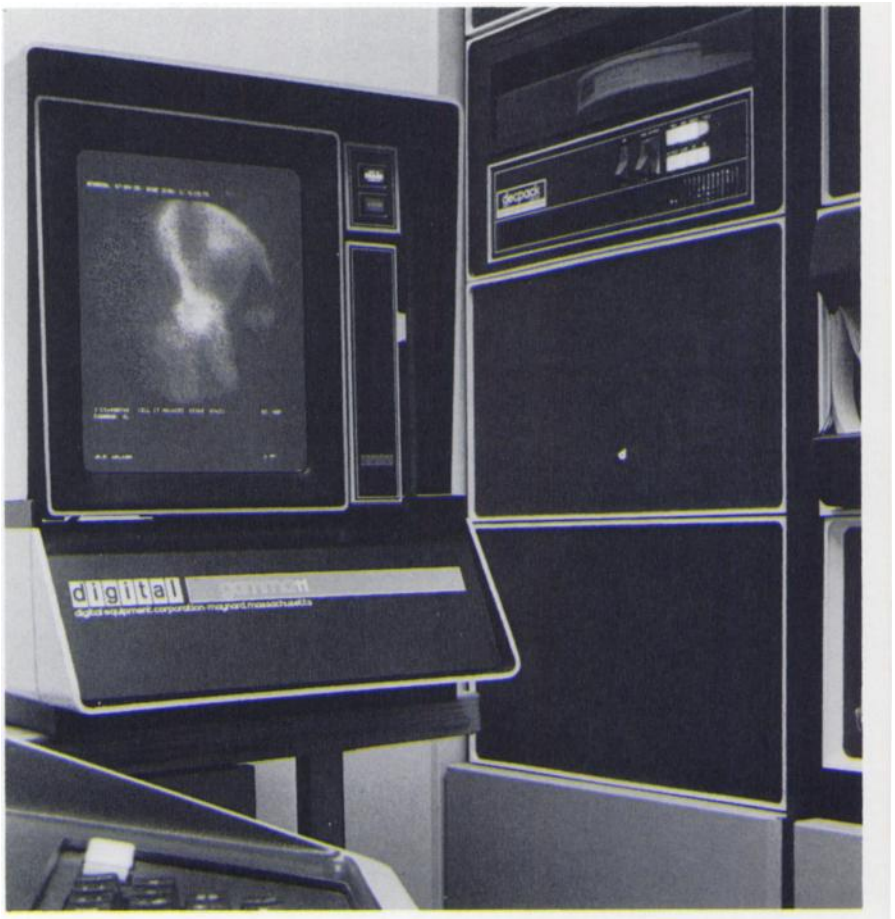
The decreased flow on the right side is suggestive of a vascular lesion.



Right heart + lungs – left heart. ROI's marked over both lung field, SVC, right atrium and right ventricle.



Pulmonary time-activity curve (2 points/sec.) showing a left-to-right shunt.



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The XYZ-101 Imaging table combines vertical motion with X & Y movement of the table top for maximum versatility with all cameras and scanners. And since it is entirely manually operated, it requires no heavy, complicated hydraulic systems, motors, or electrical connections.
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Other tables for
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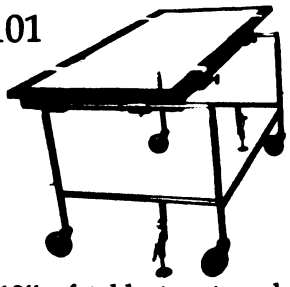

Permits 10" of table top travel in both X and Y directions with graduated calibration scales for accurate re-positioning.

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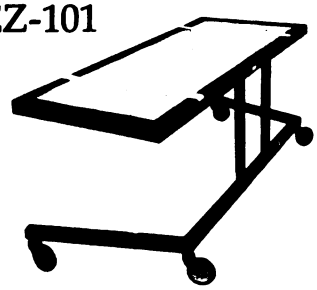

Can be raised or lowered to exact height desired for patient transfer and gamma imaging.

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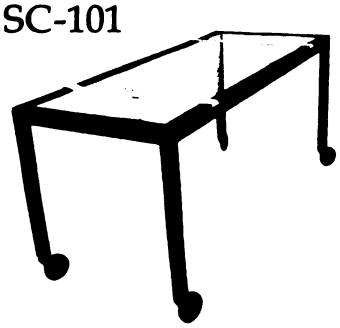
SC-101



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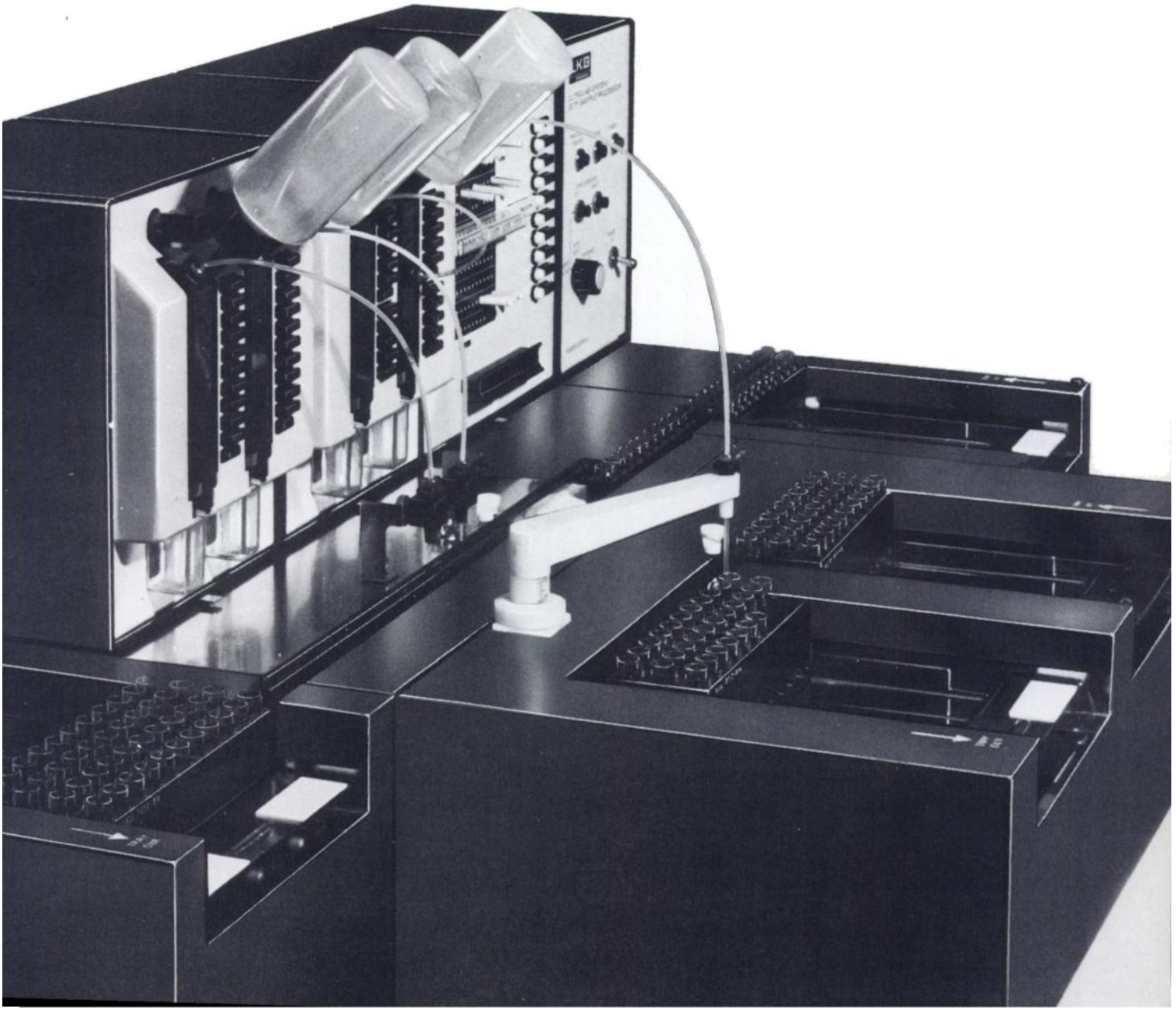

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Micromedic Systems has successfully adapted the majority of available RIA reagents to instrumentation. Now, in another major step, we offer:

RIA reagent kits

of exacting standards, developed by a leading university research center. All kits are ^{125}I-labelled, double antibody, utilizing a standard buffer from assay to assay. Protocols are matched to the system's performance and standards of the instruments below.

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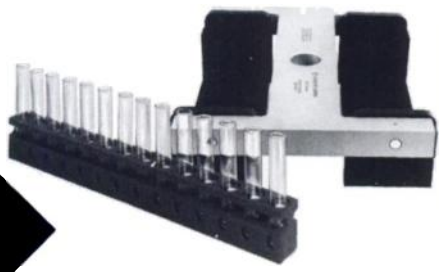
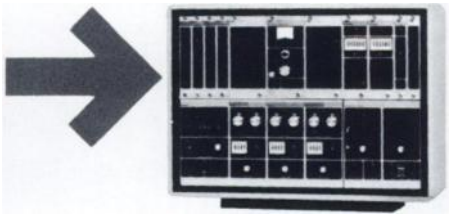


Incubation and separation. Incubation in air or water is achieved, again without tube-handling: samples remain securely in place in RIA rack. **Centrifugation** is speeded as well: rack fits popular refrigerated centrifuge heads. Centrifuged samples decanted directly from the rack with exclusive decanting clamp.



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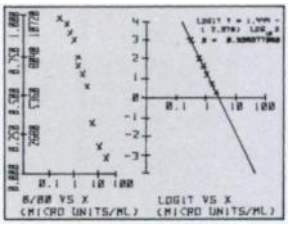

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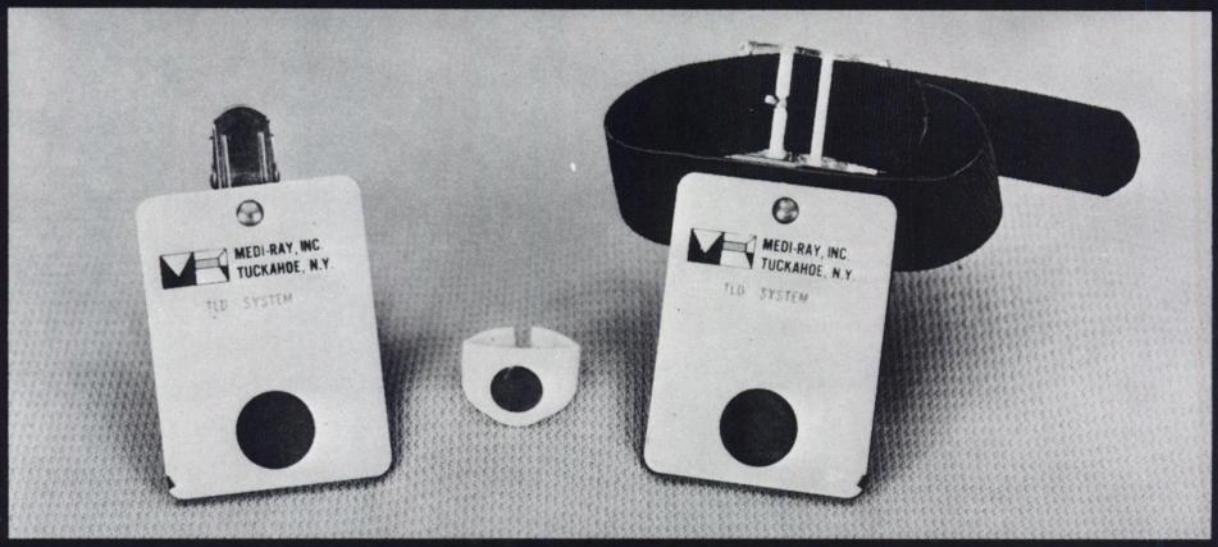

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And we are still asking.

August Miale, Jr., M.D., "A Review of Nuclear Medicine Instrumentation", CONTINUING EDUCATION LECTURES 1973, pp. 14-29.

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study: tape playback lung views
mode: 4 frame manual recorded on 5" X 7" Kodak XG-14

Three film size formats for optimum imaging versatility:
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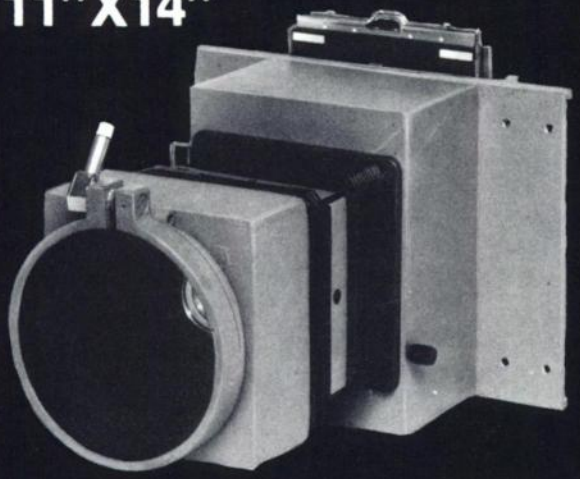

study: Tc 99 m pertechnetate renal flow
exposure: 0.8 seconds/frame
mode: 16 frame dynamic recorded on 11" X 14" X-ray film

 # MATRIX INSTRUMENTS

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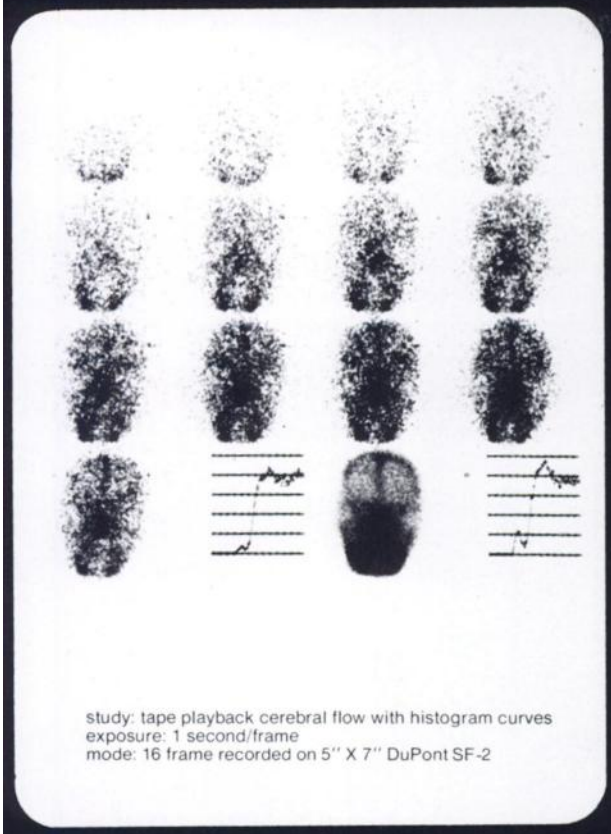
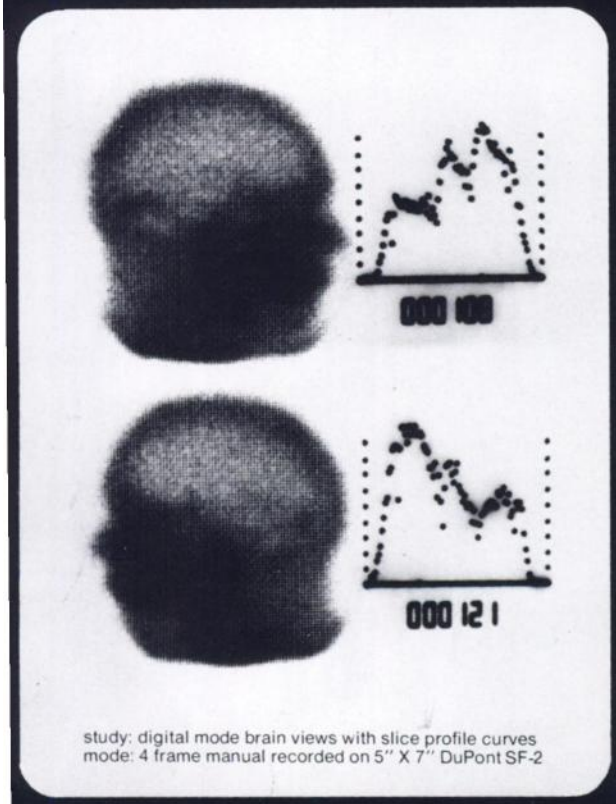


study: tape playback cerebral flow with histogram curves
exposure: 1 second/frame
mode: 16 frame recorded on 5" X 7" DuPont SF-2

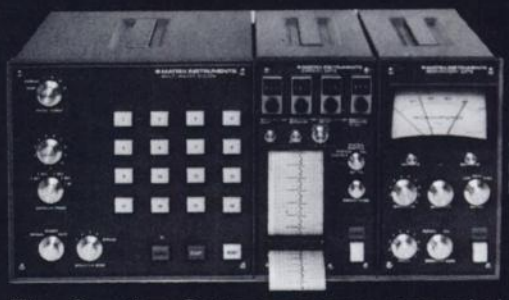


study: digital mode brain views with slice profile curves
mode: 4 frame manual recorded on 5" X 7" DuPont SF-2

The Multi-Imager System offers

- **Up to 36 image frames on a single sheet of film**
- **Physiological gating permitting imaging of predetermined multiple phases of the respiratory and/or cardiac cycles in separate frames**
- **Electronic frame advance without any moving mechanical components**
- **Electronic frame advance dead time of less than one μ second**
- **Film cost savings of up to several thousand dollars per year**
- **Compatibility with all scintillation cameras**

The Multi-Imager System is designed for use with scintillation cameras to provide dynamic, static, whole body, and physiological function synchronized imaging. The system operates by altering the CRT deflection signals, changing the size, location, and duration of the image on the display scope. Frame advance is achieved electronically, yielding sequential exposures with essentially no data loss.



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Cardiac and respiratory gating can be combined to simultaneously record in a four frame format all four possible combinations: end-systole/inspiration plateau, end-systole/expiration plateau, end-diastole/inspiration plateau, and end-diastole/expiration plateau.

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Please send Multi-Imager System literature and sample studies.

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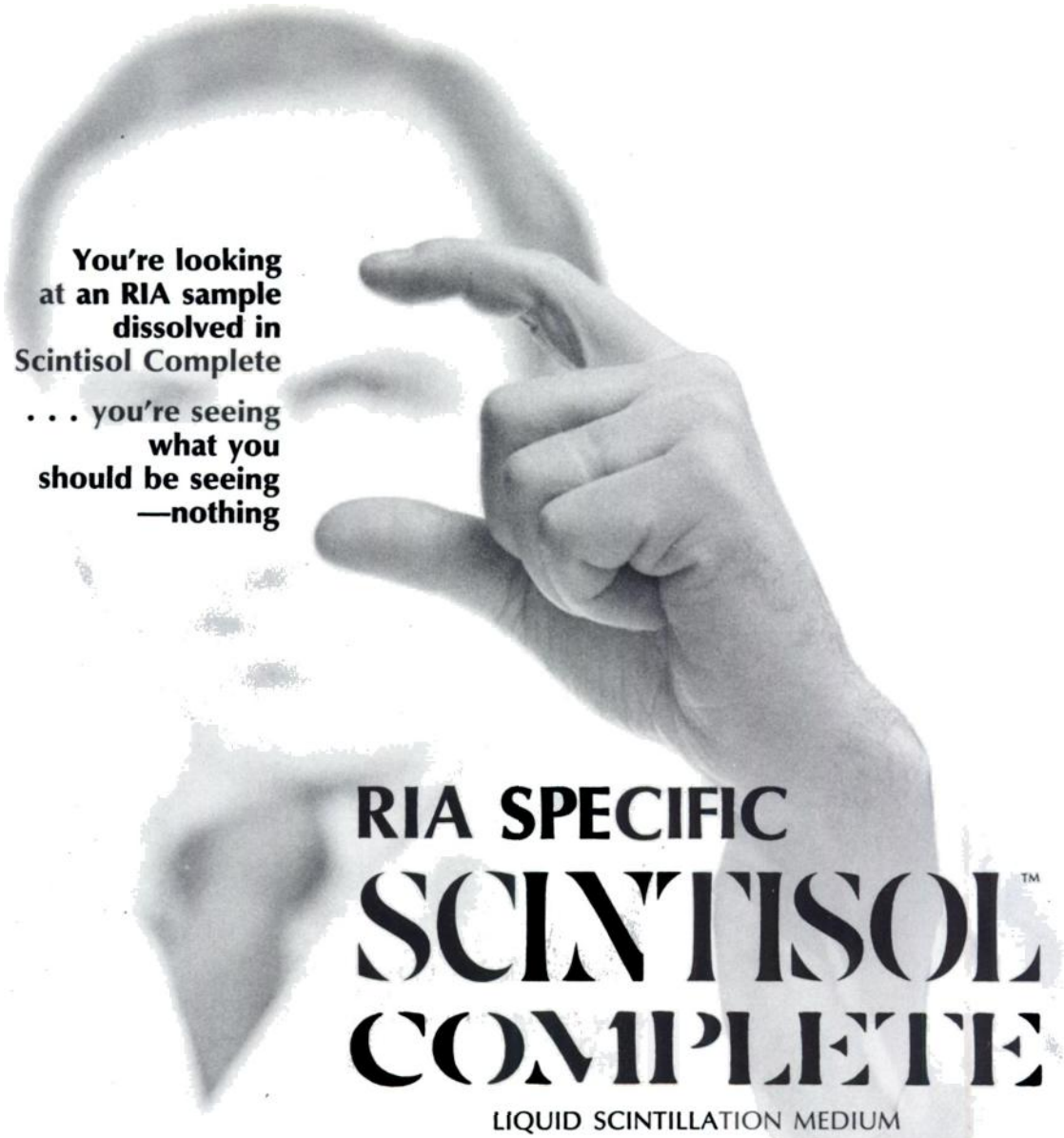

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*Lancet, Sept 25, 693-694, 1971.

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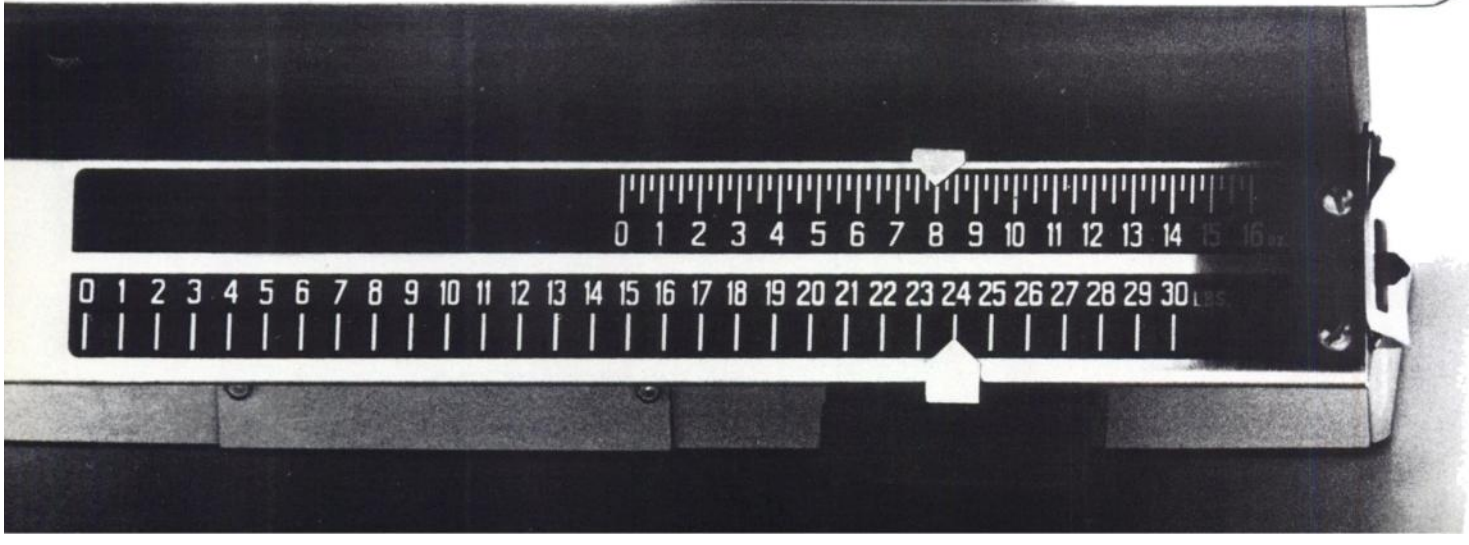

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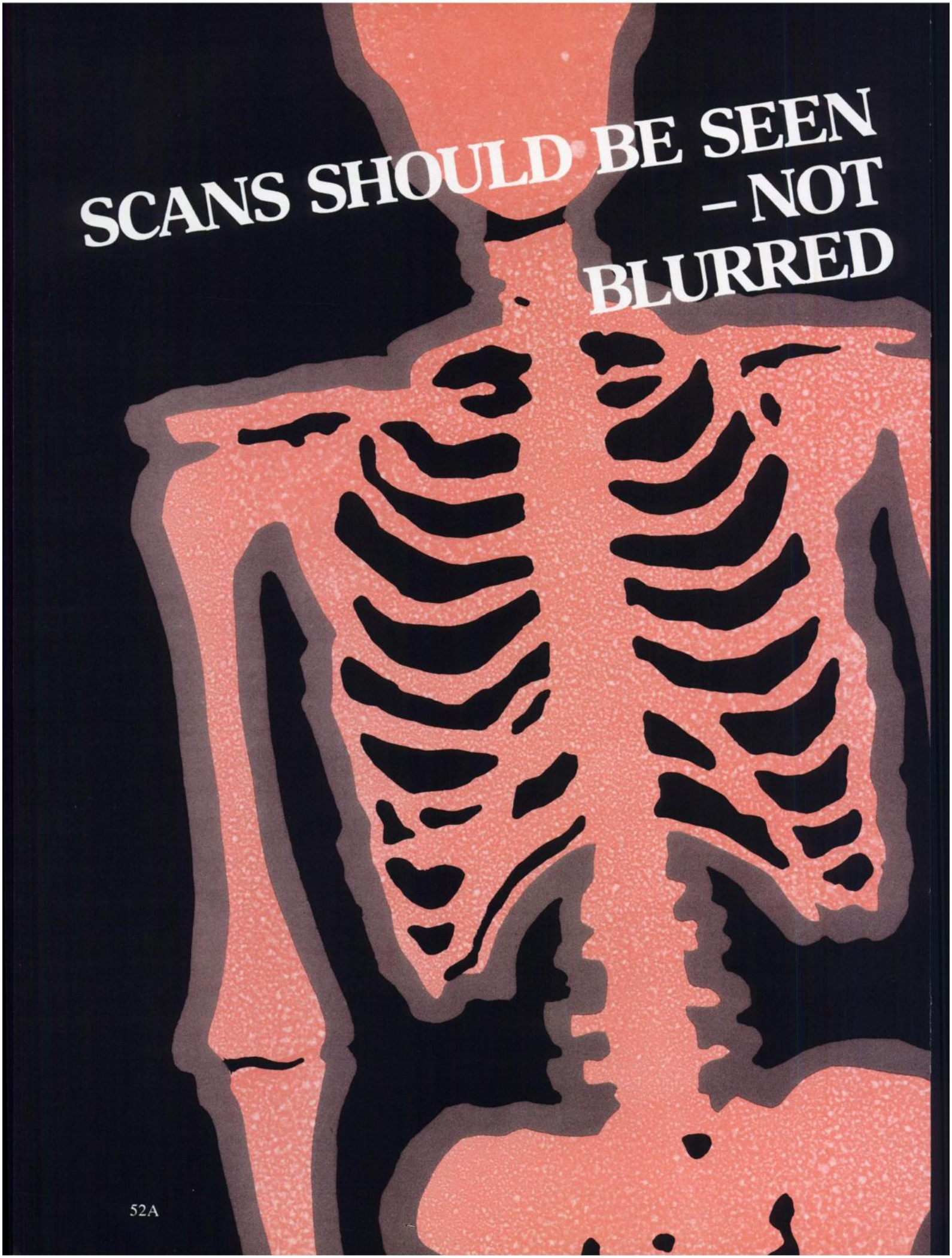
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(STANNOUS PYROPHOSPHATE)

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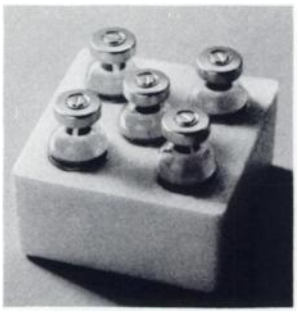
A superior bone imaging agent because:



- It is a consistent product
- It clears the bloodstream fast
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Excerpts from recent literature on stannous pyrophosphate:

"With the rectilinear scanner, ^{18}F appeared to be the best bone scanning agent. Technetium-99m-phosphate compounds were favorable for clinical use because of availability and usefulness in studies with the gamma camera. Quality of scan with polyphosphate was most variable. Sometimes phosphate compounds and ^{87m}Sr showed considerable interference with bone scan due to soft-tissue radioactivity. Diphosphonate might be regarded as the agent of choice because of its low concentration in the soft tissue. *Pyrophosphate appeared to be most favorable agent considering ease of preparation, reproducibility, and quality of scan." (1)* (Italics added.)

"While the physical properties of ^{18}F are poor, the biological properties are still superior for bone imaging. The biological properties of polyphosphate made from this kit are significantly worse than the pyrophosphate or EHDP prepared from kits. The latter two are more similar to ^{18}F in blood clearance and soft-tissue uptake." (2)

'In summary, ^{18}F seems to be the best radiopharmaceutical for bone scanning. Technetium-labeled pyrophosphate gives better results than polyphosphate of higher molecular weight, and the availability of these two compounds makes bone scanning easier." (3)

1. Hosain F, Hosain P, Wagner HN, Dunson GL, Stevenson JS: Comparison of ^{18}F, ^{87m}Sr, and ^{99m}Tc-Labeled Polyphosphate, Diphosphonate, and Pyrophosphate for Bone Scanning. J Nucl Med 14: 410, 1973 *Abst.*
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TechneScan™ PYP™ KIT

(STANNOUS PYROPHOSPHATE)

Mallinckrodt NUCLEAR

SEE FOLLOWING PAGE FOR PRESCRIBING INFORMATION

BEFORE USING, PLEASE CONSULT COMPLETE PRODUCT INFORMATION, A SUMMARY OF WHICH FOLLOWS:

DESCRIPTION

The **TechneScan PYP** reaction vial contains all of the non-radioactive reagents required to prepare a sterile, non-pyrogenic solution of Technetium Tc 99m Stannous Pyrophosphate (**TechneScan PYP** Tc 99m) for intravenous injection.

Each 10-milliliter reaction vial contains a total of 15.4 milligrams of stannous pyrophosphate in the lyophilized state in a nitrogen gas atmosphere. The pH of the solution is adjusted with hydrochloric acid prior to lyophilization.

ACTION

When injected intravenously, **TechneScan PYP** Tc 99m has a specific affinity for areas of altered osteogenesis.

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

INDICATIONS

TechneScan PYP Tc 99m is a skeletal imaging agent used to demonstrate areas of altered osteogenesis.

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.

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 only for use in the preparation of Technetium Tc 99m Stannous Pyrophosphate and are not to be directly administered to the patient.

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.

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

PRECAUTIONS

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.

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.

ADVERSE REACTIONS

None.

DOSAGE AND ADMINISTRATION

The recommended adult dose of **TechneScan PYP** Tc 99m is 5 to 15 millicuries (1 to 14 milligrams of stannous pyrophosphate). **TechneScan PYP** Tc 99m is injected intravenously over a 10- to 20-second period. For optimal results, bone imaging should be done 1 to 6 hours following administration.

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

DIRECTIONS FOR PREPARATION

Procedural Precautions

All transfer and vial stopper entries must be done using aseptic techniques.

Procedure:

1. A reaction vial is removed from the refrigerator and approximately five (5) minutes are allowed for the contents to come to room temperature.
2. Affix "Caution—Radioactive Material" label to boxed area of reaction vial label.
3. Sodium pertechnetate Tc-99m solution (1 to 10 milliliters) is added to the **TechneScan PYP** reaction vial. In choosing the amount of technetium-99m radioactivity to be used in the preparation of the **TechneScan PYP** Tc 99m (Technetium Tc 99m Stannous Pyrophosphate), the labeling efficiency, number of patients, administered radioactive dose, and radioactive decay must be taken into account. The recommended maximum amount of technetium-99m to be added to the **TechneScan PYP** reaction vial is 100 millicuries.
4. Shake the reaction vial sufficiently to bring the lyophilized material into solution. Allow to stand for five (5) minutes at room temperature.
5. Using proper shielding, the reaction vial should be visually inspected. The resulting solution should be clear and free of particulate matter. If not, the reaction vial should not be used.
6. Calculate the radioactivity concentration of the **TechneScan PYP** Tc 99m and fill in the appropriate information on the string tag.

HOW SUPPLIED

Catalog Number—094 **TechneScan PYP** Kit

Kit Contains:

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

5—Pressure-sensitive "Caution—Radioactive Material" labels.

5—Radioassay Information String Tags.

Reaction Vial Contains:

—15.4 mg Sterile Stannous Pyrophosphate (Lyophilized). Hydrochloric acid is added for pH adjustment prior to lyophilization.

TechneScan™ PYP™ KIT

(STANNOUS PYROPHOSPHATE)

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In 1974 the estimated incidence of new internal cancer cases in the United States will reach approximately 655,000 persons. Moreover, within this year 355,000 Americans will die of malignancy, a large portion of which is potentially curable.[1] Survival trends are inversely related to the extent of the disease—the less involvement, the better the chances of therapeutic success.[1,2]

This problem of detecting cancer has long absorbed researchers. Now, ten years after the basic investigations were begun, the blending of the sciences of immunology and radiochemistry has resulted in...

CEA-ROCHE ROCHE
Carcinoembryonic Antigen assay

A new *in vitro* test to aid in the management and diagnosis of cancer

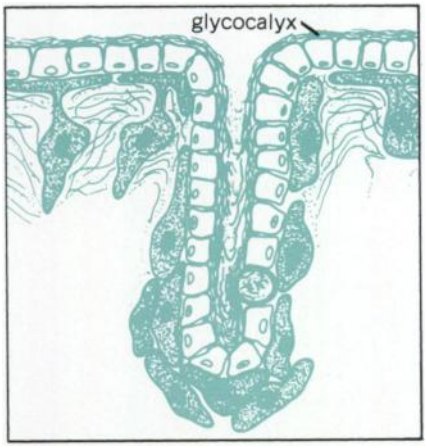
the discovery of carcinoembryonic antigen

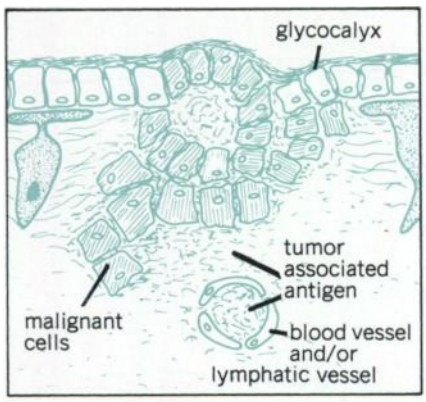
The term carcinoembryonic antigen (CEA) was first used in 1965 by Gold and Freedman of the Montreal General Hospital to describe a glycoprotein which is a constituent of the glycocalyx of embryonic entodermal epithelium; it is also present in extracts of carcinoma cells.[3-6]

The embryonic gene responsible for CEA synthesis is expressed by many carcinoma cells; however, preliminary experiments suggest that the amount of CEA in different carcinomas varies, indicating gene expression is not an all-or-none phenomenon.[7,8]

As the carcinoma disrupts the normal tissue architecture, cells penetrate the underlying tissue, and glycocalyx components including CEA enter the vascular system.

Diagrammatic representation of microscopic section of fetal colon. CEA is present in glycocalyx which faces lumen of colon.





Diagrammatic representation of primary adenocarcinoma of colon. As underlying tissue is invaded by tumor cells, CEA is released and diffuses into the vascular bed.

a long-term commitment to cancer research

Roche has long had a serious commitment to cancer research which has resulted in the development of such important chemotherapeutic agents as Fluorouracil (5-fluorouracil), FUDR (floxuridine), Efudex®(fluorouracil) and Matulane® (procarbazine HCl).[9]

Working in conjunction with the original Canadian researchers and with investigators at over 100 leading medical centers and research institutions throughout the United States, England and Canada, Roche Research has adapted, refined and evaluated this test for carcinoembryonic antigen (CEA) found in a variety of cancerous and noncancerous states.

CEA-ROCHE, a radioimmunoassay, employs the Hansen Z-gel method which is capable of detecting and measuring plasma levels of CEA in the nanogram (one billionth of a gram) range. The sensitivity of the assay has been shown to be 0.5 ng/ml of CEA.[10]

an extensive clinical evaluation

During the initial studies with CEA, it became clear that in order to obtain the reproducibility necessary to make the CEA assay an important and reliable diagnostic tool, strict standardization of procedure and reagents was required. Therefore, Roche embarked upon a unique investigational program. More than 35,000 assays using standardized CEA-ROCHE reagents and procedure were run on samples from over 10,000 patients at over 100 leading medical centers and research institutions. Identical protocols and reporting methods were also utilized, thereby subjecting the CEA-ROCHE assay to one of the most thorough and well-controlled evaluations made on a diagnostic test.

Using the CEA-ROCHE assay, elevated CEA titers have been detected in carcinomas of entodermal and nonentodermal origin; in noncarcinomatous malignancies; in such nonmalignant diseases as emphysema, inflammatory bowel disease and colorectal polyps; and in some healthy individuals, particularly chronic smokers. The following data were derived from these studies.[11]

Patients	No. of Pts.	CEA Titer Ranges 0-2.5 ng/ml	2.6-5.0 ng/ml	5.1-10 ng/ml	>10 ng/ml
Healthy Subjects					
Nonsmokers	892	97%	3%	0%	0%
Former smokers	235	93	5	1	1
Smokers	620	81	15	3	1
Colorectal Carcinoma	544	28	23	14	35
Pulmonary Carcinoma	181	24	25	25	26
Pancreatic Carcinoma	55	9	31	25	35
Gastric Carcinoma	79	39	32	10	19
Breast Carcinoma	125	53	20	13	14
Other Carcinoma	343	51	28	12	9
Noncarcinoma Malignancy	228	60	30	8	2
Nonmalignant Disease					
Benign Breast Disease	115	85	11	4	0
Rectal Polyps	90	81	15	3	1
Cholecystitis	39	77	17	5	1
Alcoholic Cirrhosis	120	29	44	25	2
Active Ulcerative Colitis	146	69	18	8	5
Pulmonary Emphysema	49	43	37	16	4

CEA-ROCHE

Carcinoembryonic Antigen assay

Clinical applications
Limitations

CEA-ROCHE as an aid in the management of cancer

When used in conjunction with other tests in the diagnostic armamentarium, this highly sensitive and quantitative radioimmunoassay has been shown to be useful as an aid in the management of the cancer patient

- by monitoring the effects of surgery, radiotherapy and chemotherapy,
- by providing a basis for re-evaluating therapy,
- by determining the probable presence of metastatic disease,
- by providing an early indication of the recurrence or progression of malignant disease.

Decreases in CEA titers were reported to be associated with effective therapy.[12-17] Serial determinations of CEA proved to be of value in assessing the condition of the patient during therapy.[13-16, 18] Persistent increases in titer were associated with a lack of response to therapy or a recurrence of disease; in some cases, the titer rise preceded clinical signs by as much as three months.[19, 20] Except for primary pancreatic and colorectal carcinoma, titers above 20 ng/ml were, with very rare exceptions, associated with the presence of metastatic disease.[20] However, metastatic disease may also occur when the CEA titer is below 20 ng/ml.

CEA-ROCHE as an aid in the diagnosis of cancer

The CEA-ROCHE assay has also been shown to be of value as an aid in cancer diagnosis. When used as an adjunct to other tests and procedures, the CEA-ROCHE assay has proven to be most useful

- in patients with signs, symptoms and clinical history suggestive of a diagnosis of cancer,
- in patients with such diseases as ulcerative colitis, pulmonary emphysema, alcoholic cirrhosis and gastric and duodenal ulcers in which the risk of developing cancer is greater than in the corresponding normal population.

These nonmalignant inflammatory diseases in their active state may give rise to CEA titers above 2.5 ng/ml. These titers usually drop below 2.5 ng/ml when these diseases are in remission.[17, 20-22]

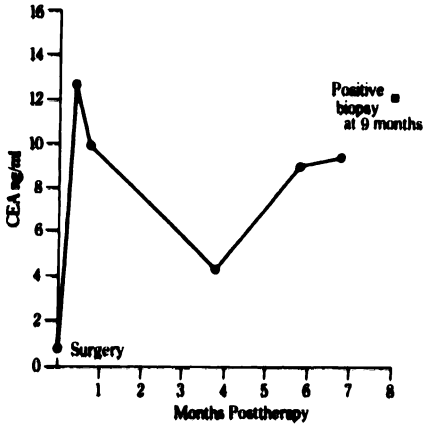
In a special study of 883 patients, cigarette smoking with titer elevations were associated with atypical sputum cytology.[23] Decreases in CEA titer often occurred within 30 to 60 days after cessation of smoking.

It must be stressed that test results and data arrived at using the CEA-ROCHE assay cannot be compared with results obtained by any other method or reagents.

limitations of CEA-ROCHE

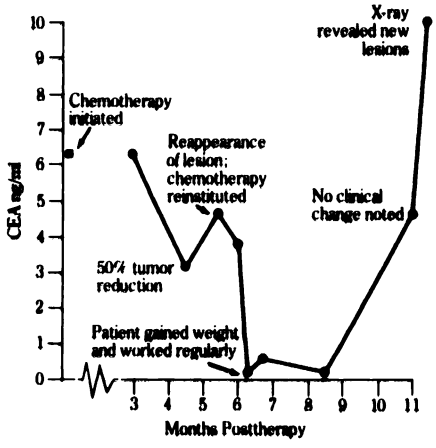
CEA-ROCHE is not recommended as a screen to detect cancer. CEA titers are not an absolute test for malignancy, nor for a specific type of malignancy. In the management and diagnosis of the patient suspected or known to have cancer, all other tests and procedures must continue to be given emphasis. CEA titers less than 2.5 ng/ml are not proof of the absence of malignant disease.

representative case history of patient being treated for malignancy without known metastases



A 42-year-old woman presented with a squamous-cell anal carcinoma. CEA-ROCHE level at time of surgery was 0.6 ng/ml. CEA titer rose to 12.6 ng/ml 10 days later and was still 9.8 ng/ml 20 days after surgery. Upon discharge three months later CEA level was 4.1 ng/ml and there was no clinical evidence of disease. Six weeks later titer had risen to 8.8 ng/ml and then to 9.3 ng/ml after another 30 days without any clinical sign of disease. Patient was hospitalized three months later and biopsy was positive for recurrence of cancer. In spite of initial low CEA value preoperatively, titer levels accurately reflected patient's condition and gave evidence of recurrence some 4 months prior to clinical signs.

representative case history of patient being treated for malignancy with metastases



Chemotherapy was initiated in a 37-year-old man presenting with synovial sarcoma and metastases to the lungs. The first CEA-ROCHE titer was performed three months later. Titer level was 6.2 ng/ml. In six weeks CEA titer dropped to 3.0 ng/ml and a 50% reduction of tumor in the right upper lobe of the lung was noted. One month later titer rose to 4.6 ng/ml and there was a reappearance of a left upper lung lesion.

Chemotherapy was reinstituted and assays run at 2, 3, 5, 12 and 20 weeks. There was no change in radiologic appearance of metastases. Patient gained weight and worked regularly. The CEA titers during this period were 3.8, 0.0, 0.5, 0.0 and 4.6 ng/ml respectively. One and one-half weeks later, CEA titer rose to 10.0 ng/ml and a review of x-ray films revealed appearance of new lesions.

The above representative case histories, using actual CEA-ROCHE titer readings and timing of assays, illustrate the correlation of results with published clinical studies.

CEA-ROCHE
Carcinoembryonic Antigen assay

A significant contribution to the management and diagnosis of cancer

availability of CEA-ROCHE

The CEA-ROCHE™ assay may be obtained through your hospital, institutional and private clinical laboratory obtaining the necessary reagents and procedure in a kit developed by Roche Diagnostics or as a direct reference service of Roche Clinical Laboratories, Inc.

And, as with all our pharmaceutical agents, this assay may be obtained for your patients who are unable to afford it through the Roche Indigent Patient Program.

comprehensive information available

Because of the clinical significance of CEA-ROCHE and the critical area of medicine involved, a comprehensive Clinical Monograph containing in-depth information on the nature of the assay, its applications and interpretation as well as an extensive summary of the collaborative study has been prepared.

It is recommended that this brochure be consulted before ordering or interpreting the CEA assay. You may obtain a copy by completing and returning the coupon below.

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☐ Please send me the CEA-ROCHE Clinical Monograph, an in-depth brochure on this test.

☐ I would like _____ (name of hospital or private clinical laboratory) to perform CEA-ROCHE testing.

☐ I would like Roche Clinical Laboratories, Inc. to perform CEA-ROCHE testing in my practice. Please send me information in this regard.

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Please return to Roche, P.O. Box 282, Nutley, N. J. 07110

K-5

ROCHE

ROCHE DIAGNOSTICS
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Nutley, New Jersey 07110

RCL

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CA-1K

DIMILUME™-30
THE SOLUTION TO CHEMILUMINESCENCE

DIMILUME-30 is a total counting system with an effective chemiluminescence inhibitor. Spurious counts are reduced to normal backgrounds in 30 minutes at 25°C. It's the perfect complement to solubilizers.

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THE RAPID-ACTION TISSUE SOLUBILIZERS

■ The SOLUENES are the fastest acting tissue solubilizers... ■ The SOLUENES contribute least amount of quenching of all tissue solubilizers... ■ SOLUENE-350 solubilizes more biological fluids into a toluene liquid scintillation solution than any other tissue solubilizer.

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THE UNIVERSAL SCINTILLATION COCKTAIL

INSTA-GEL, the original colloidal scintillator solution, is universally applicable to your counting requirements... ■ Optimum Sensitivity... ■ Applicable for nonaqueous and aqueous samples ...Equal counting efficiency in aqueous or organic phases*... ■ High efficiency, low background... ■ Count salt solutions or suspended solids... ■ Quench correction by *all* usual methods.*

*Except for two phase system between points of inversion

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THE TYPES OF RADIOACTIVE REGIONAL VENTILATION STUDIES YOU PREFER ARE YOUR BUSINESS.

HELPING YOU PERFORM THEM BETTER AND EASIER IS OUR BUSINESS.

For more than three years, the Surprenant/Douglas Automated Ventilation Module (AVM-3) has been simplifying radioxenon ventilation studies of all kinds.

The AVM-3 allows you to perform Single Breath (tidal volume or vital capacity), Rebreathe and Washout studies—singly or in the combination of your choice—using just one operator. All without patient co-operation. All with consistently reproducible results. (Single breath studies may be made at any lung volume.)

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The AVM-3 system is linked directly to your scintillation camera by remote control and automatically initiates all scintiphoto exposures at precise predetermined intervals. As a result, the only functions of the operator are to select the desired study sequence, push the start button and then collect camera data.

The AVM-3 system, with protective lead-shielding, is enclosed in a single case mounted on an overbed table for use on patients in either sitting or supine positions.

Also available is the RGD-700 Radiogas Dispenser. The RGD-700 crushes and stores curie ampules of Xenon-133 in its 35 ml. tank handle and allows you to withdraw single doses as needed. The savings which result from purchasing Xenon-133 in curie ampules as opposed to single doses at a volume of 20 studies per month, for example, are enough to pay for the RGD-700 after the first 10 procedures.

The super versatile AVM-3 and the money-saving RGD-700. Just two of the ways in which we're working to make your job a little easier.

For complete information just write Omnimedical, P.O. Box 1277, Paramount, California 90723.

Better yet, call us collect at (213) 633-6660.

OMNIMEDICAL

For the first time — a Renin Activity assay that is as fast as it is simple — GammaCoat by Clinical Assays.

- No more overnight assays
- No more complicated pipetting steps
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- No more patient sample dilutions
- Same day results

Angiotensin I is generated in a buffered pH(7.4) solution for three hours. The five step assay is then carried out in the antibody coated tubes provided with the kit.

1. Add buffer.
2. Add serum or standards. Incubate 15 minutes.
3. Add ^{125}I Angiotensin I tracer. Incubate 3 hours.
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The simplicity, speed, accuracy and reproducibility characteristic of the GammaCoat family of assays is now available for your most difficult, time-consuming assay-Renin Activity.

Also available are:

GammaCoat Digoxin (^{125}I)
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Digoxin (^{3}H)
Digitoxin (^{3}H)
Cortisol (^{3}H)

For full details contact:

Clinical Assays, Inc.

or call the nearest Fisher Scientific for fast service.

237 Binney Street • Cambridge, Mass. 02142
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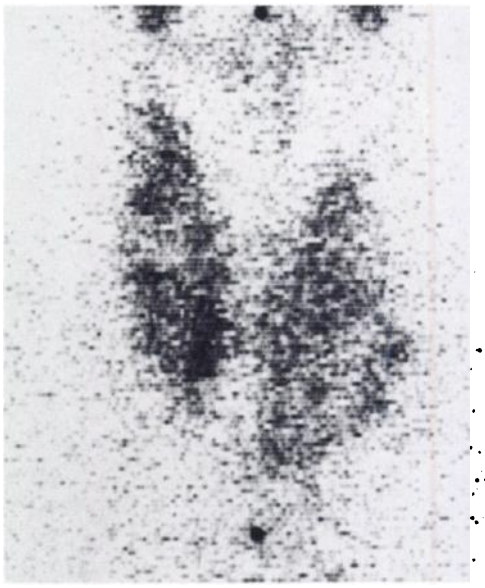
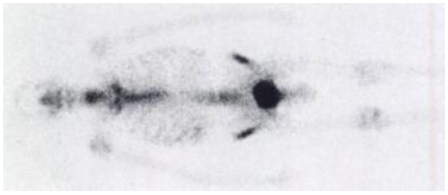
Maxiscan asks: what scan information do you need?

Then delivers it.





Whole body scans? Single organ studies? Scan minification? Multiple scans on one film? Vertex views? A choice of image display; including video, for viewing scans in black and white or color?

General Electric's Maxiscan™ two-probe whole body scanner is answering these diagnostic demands, and more, with in-hospital performance. Performance that combines more usable information with reduced procedural set-up time and less chance of technic error.

Maxiscan permits skeletal surveys within a range of 2 feet wide and 6 feet 8 inches long. The image, minified to fit 14 x 17 inch film, permits location and diagnosis of bone metastases, without a series of small area scans.

For any single organ, select full size view or minifications of 2:1, 3:1, 4:1, or 5:1. Up to four scans may be displayed on one film, with precise quadrant placement and no image overlap.

During any scanning procedure, Maxiscan minimizes patient movement. Two probes, top and bottom, cover the required isoresponse of the body without turning the patient. The patient table smoothly rolls out to permit changing of the lower probe collimator. The upper probe angulates through 270°, locks in place for safe, convenient collimator interchange. Upper or lower collimators take only seconds to change. The unit's optional vertical plane scanning permits studies with patients seated upright, as well as vertex views of the brain with patients reclining normally.

All scans may be viewed with a choice of image display: standard film photorecording or GE's optional Videodisplay unit.

Videodisplay Processor
To view and quantify patient count information in black and white or fully functional color, Maxiscan can be combined with GE's Videodisplay and Processing Unit. Images are displayed on a video monitor; count data is stored in the unit's electronic memory, and can be manipulated to enhance desired details and to aid interpretation and diagnosis. Enhanced VDP data may be played back to Maxiscan and recorded on 14 x 17 inch film. Scans can also be recorded on cassette tape for off-line playback and teaching purposes. Count information, obtained from any scanner or camera, can be transmitted from one VDP to another over regular telephone lines.

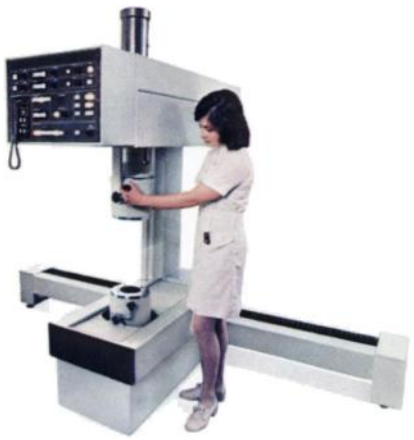
GENERAL ELECTRIC

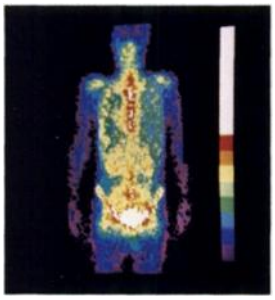
Here's the information hospitals are getting with Maxiscan...

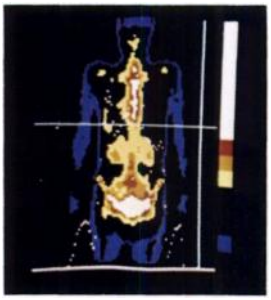
Hospitals report scanning performance like this from the Maxiscan system:

These reproductions of scans, from clinical examinations, illustrate the range of diagnostic information possible with Maxiscan and the Videodisplay Processor.

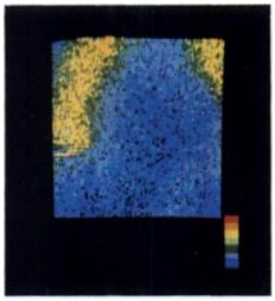
A GE motion picture demonstrates the full capability of both units. Ask your GE representative to schedule a desk top showing, at your convenience.

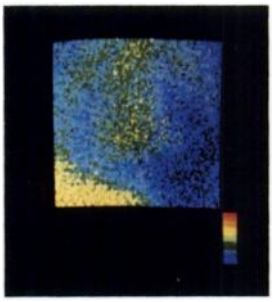






These three images, from a single whole body scan, demonstrate how manipulation of data stored in the VDP electronic memory can enhance desired details and aid diagnosis. The isotope used was ^{99m}Tc Polyphosphate. At left, an anterior view displays raw, unmanipulated data from the memory. At right, smoothed data is shown with a Y axis electronic slice through the area of suspicion. The count profile superimposed over this image and shown separately, center, confirms greater uptake on the right side. The photorecorded image showed only a suspicion of greater isotope uptake.





In a case of suspected pericardial effusion, a transmission scan (left) of the chest was obtained using an Iodine 131 source. An emission scan (center) of the same region was simultaneously obtained with the same probe, 15 minutes after an intravenous injection of ^{99m}Tc labeled albumin. The heart and liver are outlined. Note how the intracardiac activity (central area of center scan) fails to fill the large mediastinal shadow (central blue area of left scan). This discrepancy, between heart size and that of the mediastinum, is more easily seen when these two scans are superimposed (right); a technic easily accomplished on the VDP. The resulting diagnosis, a large pericardial effusion which appears to be predominantly left-sided, was confirmed by the aspiration of 1800 ml. of fluid from an encysted pericardial effusion.

Scans courtesy of Dr. M. J. Chamberlain, University Hospital, London, Ontario.

General Electric Medical Systems, Milwaukee and Toronto.
In Europe, Elscint GmbH, Wiesbaden; Elscint France SARL, Buc.

GENERAL ELECTRIC

A better way to clean up the leftovers.

Lift them off with Count-Off™ radioactivity decontaminant.
Get rid of radioactive residues, such as carbon-14, tritium, phosphorus-32, iron-59, and iodine-131. Remove ordinary nuisances such as greases, fatty and amino acids, protein complexes, Canada balsam, dried blood and serum, and polymer films.

Count-Off is an economical and extremely effective decontaminant—more so than chromic acid. Normal dilution of the liquid concentrate is 2%. Also available as an aerosol spray for cleaning rough surfaces and hard-to-reach spots, and as a foam hand cleaner.

Count-Off is safe to the skin, will not produce toxic gases from substrates containing radioactive materials such as carbon-14 and iodine-131.

Please send me:
Liquid Concentrate NEF-942 ☐ 4 liters (price $26) ☐ 4x4 liters (price $78)
Aerosol Spray NEF-942A ☐ 6x18 oz. (price $37)
Foam Hand Cleaner NEF-942B ☐ 6x18 oz. (price $37)

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New diphosphonate bone scanning agent offers high target to non-target ratio, rapid blood clearance

Your confidence in detecting bone lesions depends on the ability of the imaging agent you use to deliver consistently excellent scans. Three hours post injection, 40-50% of ^{99m}Tc-labeled OSTEOSCAN has been taken up in the skeleton. Only 6% remains in the blood. The remainder is excreted in the urine. Together with the agent's low soft tissue uptake, the high target to non-target ratio and rapid blood clearance result in clear delineation of skeletal lesions.

OSTEOSCAN consistently provides high labeling efficiency (greater than 95%*). Because of its stable P-C-P bond, OSTEOSCAN resists *in vitro* hydrolysis and *in vivo* dissociation. This helps to minimize soft tissue uptake that can impair diagnoses.

Result: Consistently excellent scans—and confidence that detectable bone lesions will be imaged.

For product and ordering information, call Mr. Arnold P. Austin at (513) 977-8547 or write: *Procter & Gamble, Professional Services Division, P.O. Box 171, Cincinnati, Ohio 45201.*

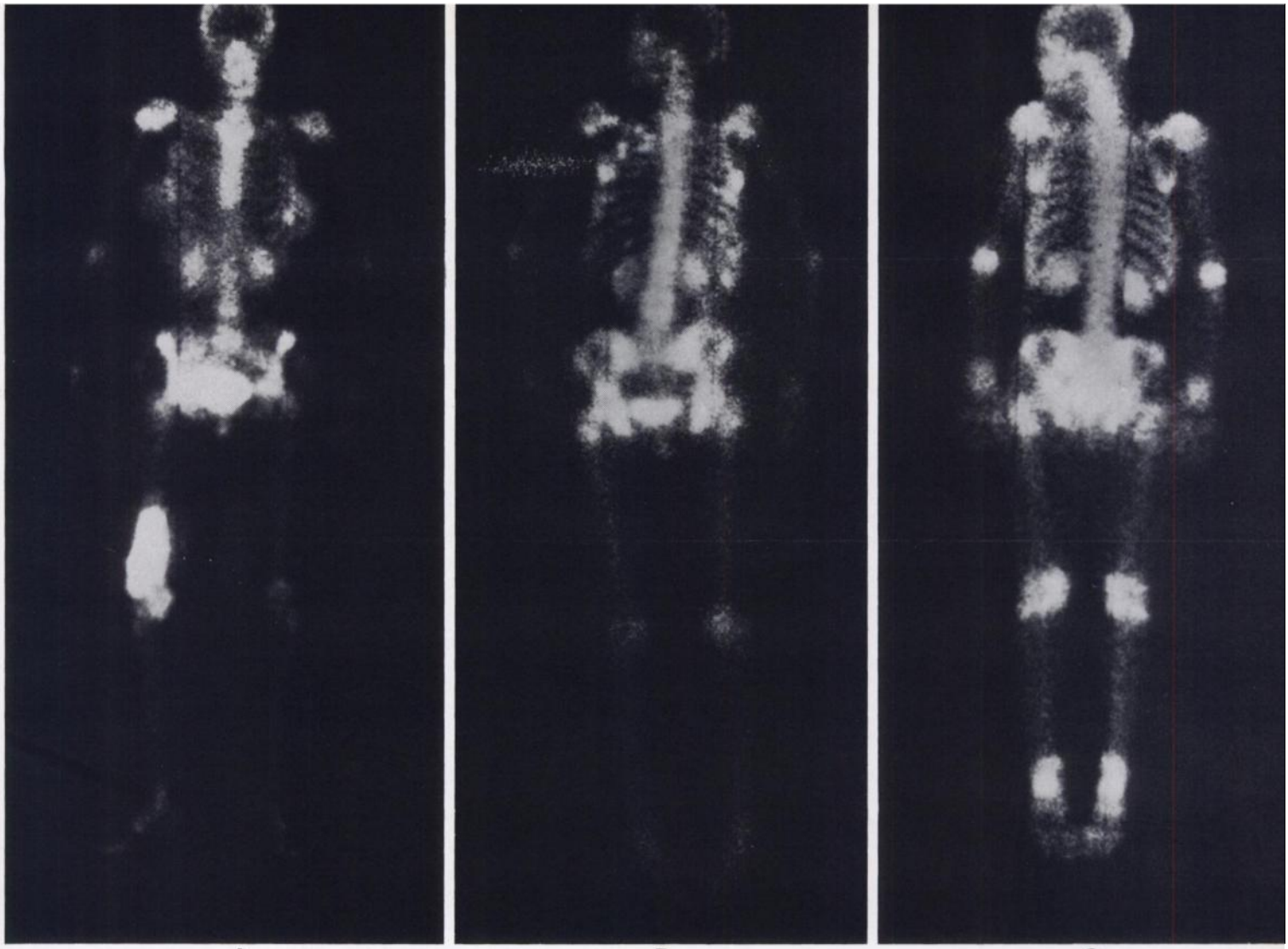
*Thin Layer Chromatography (Cellulose acetate/85% methanol)

A. 15 mCi ^{99m}Tc-OSTEOSCAN
Scanned 3.5 hr post injection
Low-Energy, All-Purpose Collimator
Speed: 32 cm/min, Length: 173 cm, Width: 60 cm
Anterior: 834,518 counts/1070 sec (17.8 min)
Comments: Metastatic meningioma

B. 15 mCi ^{99m}Tc-OSTEOSCAN
Scanned 4 hr post injection
High Sensitivity Collimator
Speed: 32 cm/min, Length: 170 cm, Width: 60 cm
Posterior: 961,752 counts/1054.3 sec (17.6 min)
Comments: Cancer of breast. Polaroid image; posterior view taken with detector under table

C. 15 mCi ^{99m}Tc-OSTEOSCAN
Scanned 4 hr post injection
Low-Energy, All-Purpose Collimator
Speed: 48 cm/min, Length: 175 cm, Width: 60 cm
Anterior: 927,833 counts/737.4 sec (12.3 min)
Comments: Patient being treated for a lymphoma

(Above scans made with Searle Radiographics Pho/Gamma Scintiscan™)

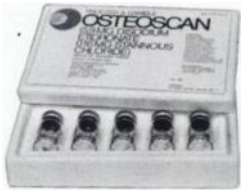


PROCTER & GAMBLE

OSTEOSCAN

(5.9 MG DISODIUM ETIDRONATE 0.16 MG STANNOUS CHLORIDE)

SKELETAL IMAGING AGENT



Brief summary of Package Insert. Before using, please consult the full Package Insert included in each kit.

DESCRIPTION

Each vial of OSTEOSCAN contains 5.9 mg disodium etidronate and 0.16 mg stannous chloride as active ingredients. Upon addition of ADDITIVE-FREE ^{99m}Tc-pertechnetate, these ingredients combine with ^{99m}Tc to form a stable soluble complex.

ACTIONS (CLINICAL PHARMACOLOGY)

When injected intravenously, ^{99m}Tc-labeled OSTEOSCAN has a specific affinity for areas of altered osteogenesis. Areas of bone which are undergoing neoplastic invasion often have an unusually high turnover rate which may be imaged with ^{99m}Tc-labeled OSTEOSCAN.

Three hours after intravenous injection of 1 ml ^{99m}Tc-labeled OSTEOSCAN, an estimated 40-50% of the injected dose has been taken up by the skeleton. At this time approximately 50% has been excreted in the urine and 6% remains in the blood. A small amount is retained by the soft tissue. The level of ^{99m}Tc-labeled OSTEOSCAN excreted in the feces is below the level detectable by routine laboratory techniques.

INDICATIONS

OSTEOSCAN is a skeletal imaging agent used to demonstrate areas of altered osteogenesis.

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.

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 ^{99m}Tc-generator should be tested routinely for molybdenum breakthrough and aluminum. If either is detected, the eluate should not be used.

PRECAUTIONS

Both prior to and following ^{99m}Tc-labeled OSTEOSCAN administration, patients should be encouraged to drink fluids. Patients should void as often as possible after the ^{99m}Tc-labeled OSTEOSCAN injection to minimize background interference from accumulation in the bladder and unnecessary exposure to radiation.

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.

ADVERSE REACTIONS

None.

DOSAGE AND ADMINISTRATION

The recommended adult dose of ^{99m}Tc-labeled OSTEOSCAN is 1 ml with a total activity range of 10-15 mCi. ^{99m}Tc-labeled OSTEOSCAN should be given intravenously by slow injection over a period of 30 seconds within three (3) hours after its preparation. Optimum scanning time is 3-4 hours postinjection.

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

THE NUCLEAR MEDICINE INSTITUTE CONTINUING EDUCATION PROGRAM FOR PHYSICIANS IN NUCLEAR MEDICINE

After a very successful second year the Nuclear Medicine Institute is presenting a third four week comprehensive course for physicians in nuclear medicine. This program is geared to the physician interested in continuing education in nuclear medicine and to those preparing to participate in the various specialty board examinations in nuclear medicine. The subject material covered will include:

- Physics
- Instrumentation
- Radiochemistry
- In vivo & in vitro procedures
- Dynamic and static imaging procedures
- Interpretative sessions

A unique interrupted schedule format has been chosen so that maximum duration away from home will be five days at a time. Classes will be held the weeks of:

- February 17–21, 1975
- March 17–21, 1975
- April 14–18, 1975
- May 12–16, 1975

Sessions will be five days each, Monday thru Friday. Subject materials will be intermixed and cumulative.

For further information, contact:

D. Bruce Sodee, M.D., *Director*
Nuclear Medicine Institute
6760 Mayfield Road
Cleveland, Ohio 44124

POSITIONS OPEN

MEDICAL TECHNOLOGISTS (NUclear medicine). Nuclear Medical Technologist (ASCP) for modern 275-bed hospital. Excellent fringe benefits. Contact Personnel Office, Newport Hospital, Friendship Street, Newport, R.I. 02840. An equal opportunity employer.

IMMEDIATE OPENING FOR REGISTered or Board Eligible Nuclear Medical Technologist to work in a 507 bed acute care hospital located in the Piedmont Area of North Carolina. Attractive salary and benefit program. The climate is mild and the area is close to both the mountains and the seashore. Apply: Personnel Office, Presbyterian Hospital, Box 10157, Charlotte, N.C. 28237.

NUCLEAR MEDICINE TECHNOLOgist. Staff position for experienced, registered Nuclear Medicine Technologist. College degree in sciences desirable but not mandatory. Starting salary $10,778 yr–$11,669 yr depending on experience and qualifications. Many fringe benefits and scheduled salary increases. Contact: Personnel Office, Southern California Permanente Medical Group, 4900 Sunset Blvd., Los Angeles, Calif. 90027, Tel. (213) 667-4193.

POSITIONS WANTED

CHALLENGING OPPORTUNITY sought in Nuclear Medicine by physician, certified by American Board of Nuclear Medicine and also in Therapeutic Radiology, licensed in N.Y., N.J., Pa. Please reply to Box 501, Society of Nuclear Medicine, 305 East 45th Street, New York, N.Y. 10017.

PHYSICIST—WITH TRAINING IN NUclear medicine instrumentation and radiation safety desires full-time hospital staff position. For resume write: Thomas S. Crowther, M.S., 14 Dudley Road, Bedford, Massachusetts 01730.

CHALLENGING POSITION SOUGHT. Experienced Chief Nuclear Medicine Technologist and administrator, BS Degree, Registered in United States and Great Britain, desires responsible position in Nuclear Medicine with research, teaching, and/or management, in New York or New England. Please reply Box 502 SNM, 305 East 45th Street, New York, N.Y. 10017.

INTRODUCTORY ONE WEEK PHYSICIAN COURSE IN NUCLEAR MEDICINE
Cleveland, Ohio

Contact: D. Bruce Sodee, M.D., Nuclear Medicine Institute, 6760 Mayfield Road, Cleveland, Ohio 44124

1974 — June 3–7, September 9–13, October 7–11, December 2–6

ONE YEAR TECHNOLOGIST COURSE IN NUCLEAR MEDICINE
Cleveland, Ohio

Contact: D. Bruce Sodee, M.D., Nuclear Medicine Institute, 6760 Mayfield Road, Cleveland, Ohio 44124

1974 — July 1–September 20, September 30–December 20

1975 — January 2–March 28, March 31–June 20, June 23–September 12, September 29–December 19

At last! A readable explanation of a complex subject . . . . .

A CLINICIAN'S GUIDE TO THE MODULATION TRANSFER FUNCTION

by MARTIN L. NUSYNOWITZ, M.D., COL., MC

A new book presented in part as a scientific exhibit at the Society of Nuclear Medicine Meeting, Boston, 1972.

Available for $3.00 from Martin L. Nusynowitz, M.D., William Beaumont Army Medical Center, El Paso, Texas 79920.

TOPICS IN NUCLEAR MEDICINE

The Sixth Annual Seminar in Nuclear Medicine will be held at Colby College in Waterville, Maine from August 19–23, 1974. Twenty hours of lectures, panel discussions and illustrative cases will be presented by Dr. H. N. Wagner, Jr., W. B. Nelp, T. G. Mitchell, S. M. Larson, H. W. Strauss and I. Goodof. The course is approved for Category I credit by the American Medical Association.

For further information contact **Dr. Robert Kany, Director of Special Programs, Colby College, Waterville, Maine 04901.**

Chemist/Scientist

MICROBIOLOGIST
VIROLOGIST

Experienced in ultracentrifugation and zonal techniques, protein purification techniques, agglutination techniques. Supervisory experience would be helpful.

Curtis Nuclear Corporation is a progressive, fast growing company which offers excellent opportunity for personal and economic growth.

The successful applicant and family will be moved to Southern California at company expense. Please submit curriculum vitae and resume to:

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CURTIS NUCLEAR CORPORATION
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An equal opportunity employer

Chemist/Scientist

MICROBIOLOGIST
ORGANIC OR INORGANIC CHEMIST
MS or PhD

Experienced in iodination of proteins, protein purification techniques. Proficient use of laboratory instruments and supervisory experience would be helpful.

Curtis Nuclear Corporation is a progressive, fast growing company which offers excellent opportunity for personal and economic growth.

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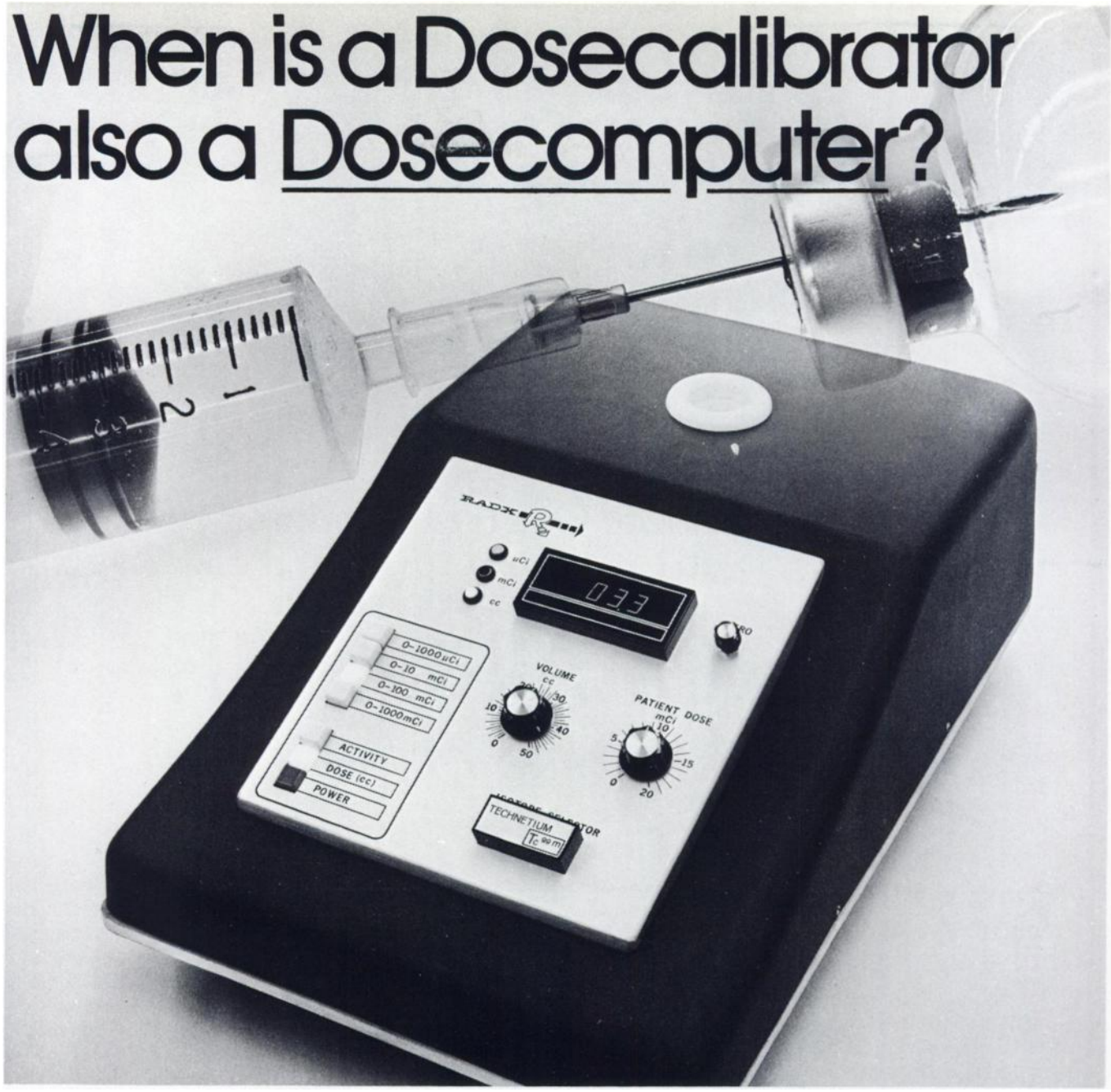
When is a Dosecalibrator also a Dosecomputer?



When it's a RADX Mark V.

The RADX Mark V was designed specifically for Nuclear Medicine departments, with digital read-out and an oversize well-type ionization chamber for high statistical accuracy. No geometric errors. Impervious to barometric pressure changes.

Only the RADX Mark V dosecalibrator measures the activity of radionuclides from 1 μCi to 1000 mCi, then computes the exact volume needed for patient injection.

Programming the Mark V for various isotopes is error-free. You simply plug in a module for the isotope you are assaying. The Mark V may be customized to your specific needs by acquiring only the modules corresponding to the isotopes you are currently using. However additional modules may be added at any time. Updating is simple and economical.

And as if all of this were not enough, RADX recognizes that a day without your Mark V is like a day without sunshine. If during the warranty period, your Mark V does not perform within stated specifications, RADX will air express you a loaner to use while yours is being repaired—at no charge.

Then consider that the Mark V costs much less than other dosecalibrators that do not provide all of these features. Now call RADX.

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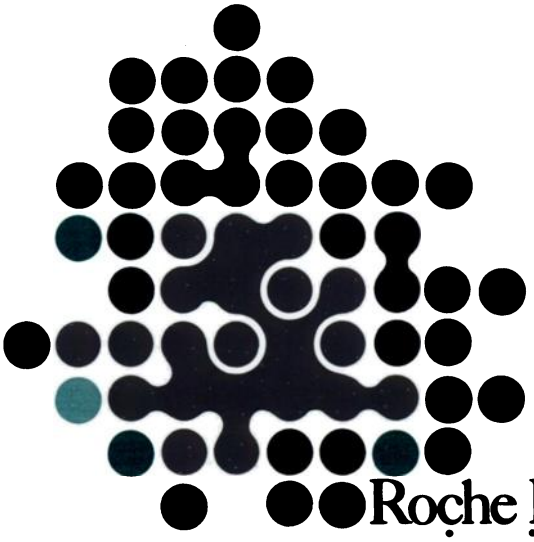


Roche Diagnostics announces an *in vitro* test to aid in the management and diagnosis of cancer

CEA-ROCHE

Carcinoembryonic Antigen assay

CEA-ROCHE: a diagnostic test of major clinical significance

Roche has long had a serious commitment to cancer research which has resulted in several important chemotherapeutic agents. Now, working in conjunction with the original researchers and with investigators at over 100 leading medical centers throughout the United States, England and Canada, Roche Research has adapted, refined and evaluated CEA-ROCHE, an *in vitro* test for the carcinoembryonic antigen (CEA) found in a variety of malignant and nonmalignant conditions. An extensive collaborative study, under way for almost three years, has tested CEA-ROCHE in over 35,000 assays in more than 10,000 patients using identical protocols, procedures and reporting methods.[1] Because of the importance of this assay, one of the most thorough and well controlled research programs conducted for a diagnostic product was undertaken. The following data were derived from these studies.

Decreases in CEA titers were reported to be associated with effective therapy.[2-7] Serial determinations of CEA proved to be of value in assessing the condition of the patient during therapy.[3-6,8] Persistent increases in titer were associated with a lack of response to therapy or a recurrence of disease; in some cases, the titer rise preceded clinical signs by as much as three months.[9,10] Except for primary pancreatic and colorectal carcinoma, titers above 20 ng/ml were, with very rare exceptions, associated with the presence of metastatic disease.[10] However, metastatic disease may also occur when the CEA titer is below 20 ng/ml.

Nonmalignant inflammatory diseases in their active state may give rise to CEA titers above 2.5 ng/ml. These titers usually drop below 2.5 ng/ml when these diseases are in remission.[7,10-12]

In a special study of 883 patients, cigarette smoking with titer elevations was associated with atypical sputum cytology.[13] Decreases in CEA titer often occurred within 30 to 60 days after cessation of smoking.

It must be stressed that test results and data arrived at using the CEA-ROCHE assay cannot be compared with results obtained by any other method or where other reagents are used.

CEA-ROCHE: limitations

CEA-ROCHE is not recommended as a screen to detect cancer. CEA titers are not an absolute test for malignancy, nor for a specific type of malignancy. In the management and diagnosis of the patient suspected or known to have cancer, all other tests and procedures must continue to be given emphasis. CEA titers less than 2.5 ng/ml are not proof of the absence of malignant disease.

CEA-ROCHE: nature of assay

CEA-ROCHE uses the Hansen Z-gel method and combines the specificity of an immunological procedure and the sensitivity of radiochemistry. It provides results at nanogram (billionth of a gram) levels and detects CEA levels as low as 0.5 ng/ml. Briefly, the principle of CEA-ROCHE is as follows: CEA is extracted from the plasma specimens and allowed to react with specific CEA antiserum. ^{125}I-CEA is then added and allowed to react with the remaining CEA antiserum. The ^{125}I-CEA bound to antibody is separated from excess free ^{125}I-CEA with zirconyl phosphate gel and the bound ^{125}I-CEA determined by counting in a gamma scintillation spectrometer. The partition of ^{125}I-CEA between bound and free fractions is a function of the amount of CEA present in the plasma. The amount of CEA present in the plasma sample is determined from a standard inhibition curve.

CEA-ROCHE: the test kit

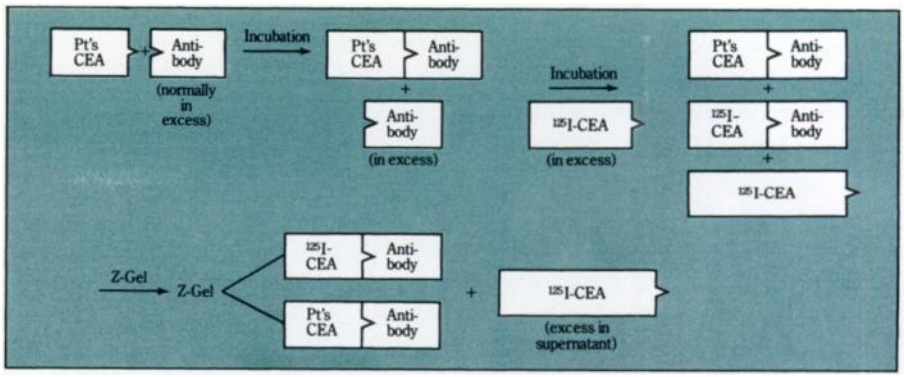
Each kit contains CEA antiserum, CEA standard, ^{125}I-CEA, EDTA buffer stock solution and zirconyl phosphate gel (Z-gel). All components are supplied in excess to assure sufficient material for at least 100 tubes (or for approximately 40 patient plasma samples assayed in duplicate with the necessary controls). Because of the stringent quality control procedures used in the production of CEA-ROCHE, you are assured of consistency from lot to lot. The CEA-ROCHE™ kit has a 17-day shelf-life and should be stored at 4° to 8° C. Store EDTA buffer and Z-Gel at 15° to 30° C.

■ materials available

Control specimens in four titer ranges (0-2.5 ng/ml, 2.6-5.0 ng/ml, 5.1-10.0 ng/ml, greater than 10.0 ng/ml); 2.5-ml dispensers for Z-gel bottles; presealed dialysis bags and ^{125}I-CEA to refurbish kits which may have expired are all available separately from Roche Diagnostics.

■ equipment needed

The laboratory must have the following equipment to perform CEA-ROCHE: micropipettes; vortex-type mixer; horizontal-head centrifuge; gamma scintillation spectrometer and access to approximately 150 liters/100 tubes of distilled or deionized water.



CEA-ROCHE Utilizing the Hansen Z-Gel Method

■ AEC license required

Because CEA-ROCHE contains radioactive material, an AEC or agreement State license is required. A copy of your license or completed License Declaration Form available from Roche Diagnostics is required before shipment can be made.

ROCHE DIAGNOSTICS: provides these special services to laboratories using CEA-ROCHE

Because of the clinical significance of the CEA-ROCHE assay and the critical area of medicine involved, Roche Diagnostics will provide laboratories wishing to run this test with advice and technical assistance in setting up the necessary facilities. Should any questions arise during testing, Roche Diagnostics will be pleased to provide further advice and assistance. A plasma evaluation service and consultation on volume processing are also available.

In addition, two in-depth brochures have been prepared:

1. CEA-ROCHE Clinical Monograph—providing complete clinical information.
2. CEA-ROCHE Procedure Manual—providing complete technical information.

Either or both may be obtained by completing and returning the reply coupon below.

Finally, Roche Diagnostics will be sponsoring an extensive educational program to physicians, including audio, visual and print material.

references:

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☐ CEA-ROCHE Clinical Monograph

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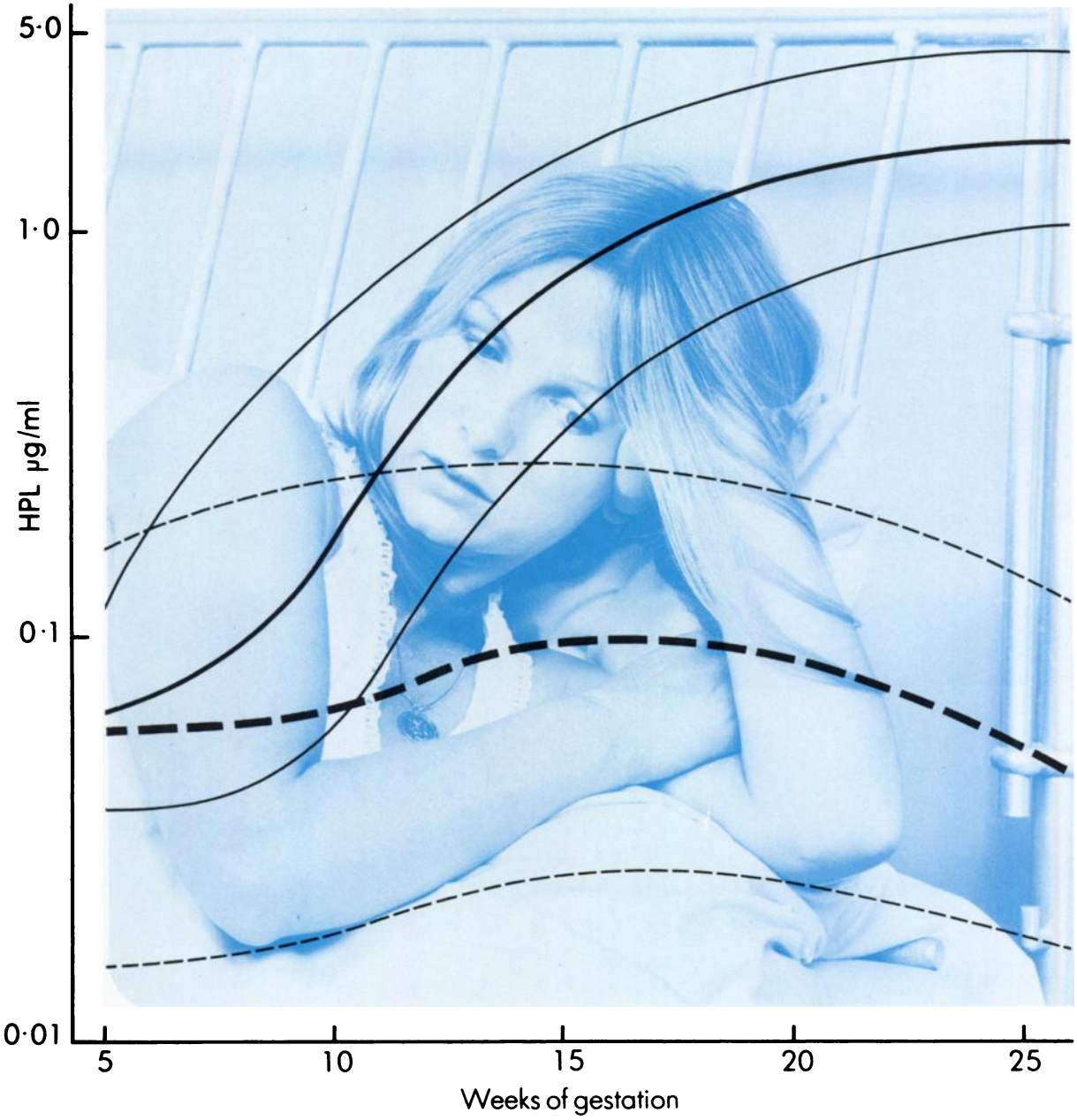

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Reference Brit Med J, **3**, 799-801, 1972.

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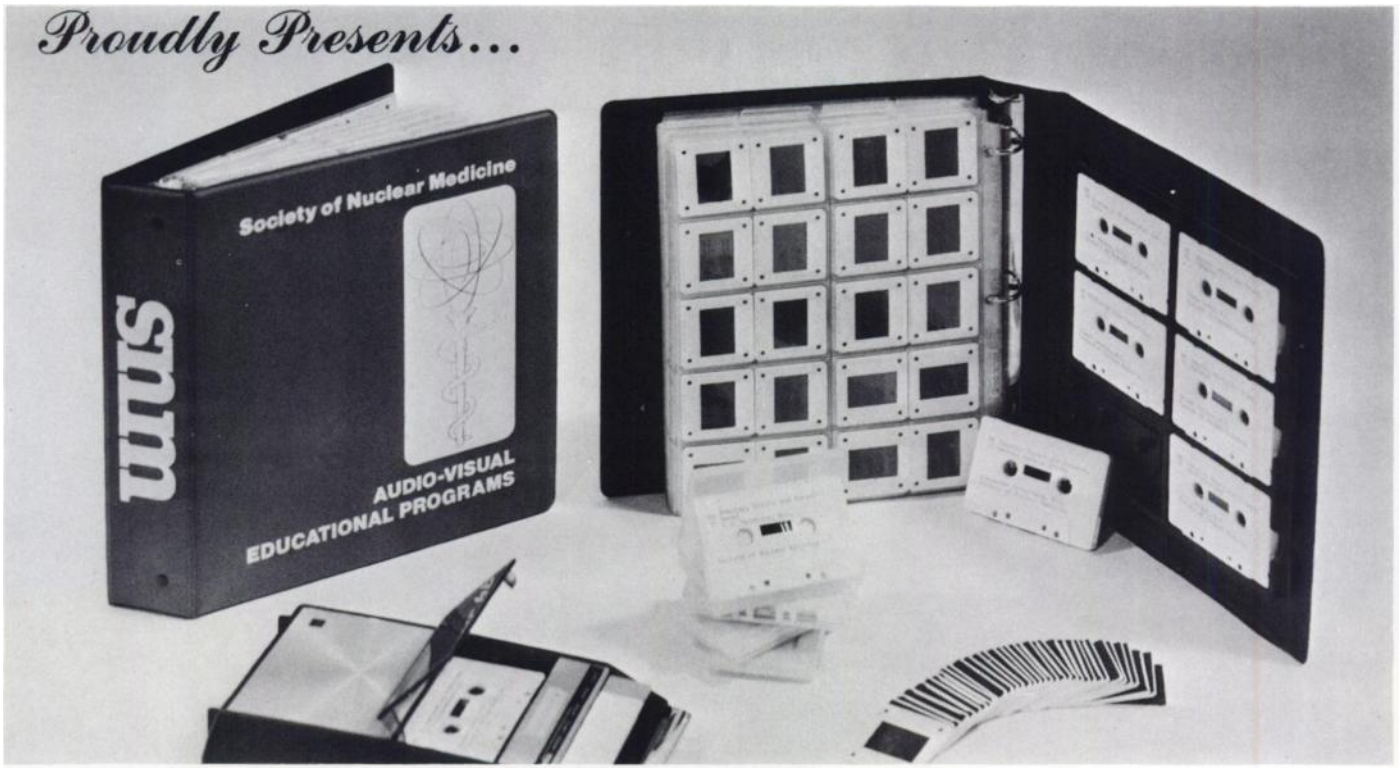

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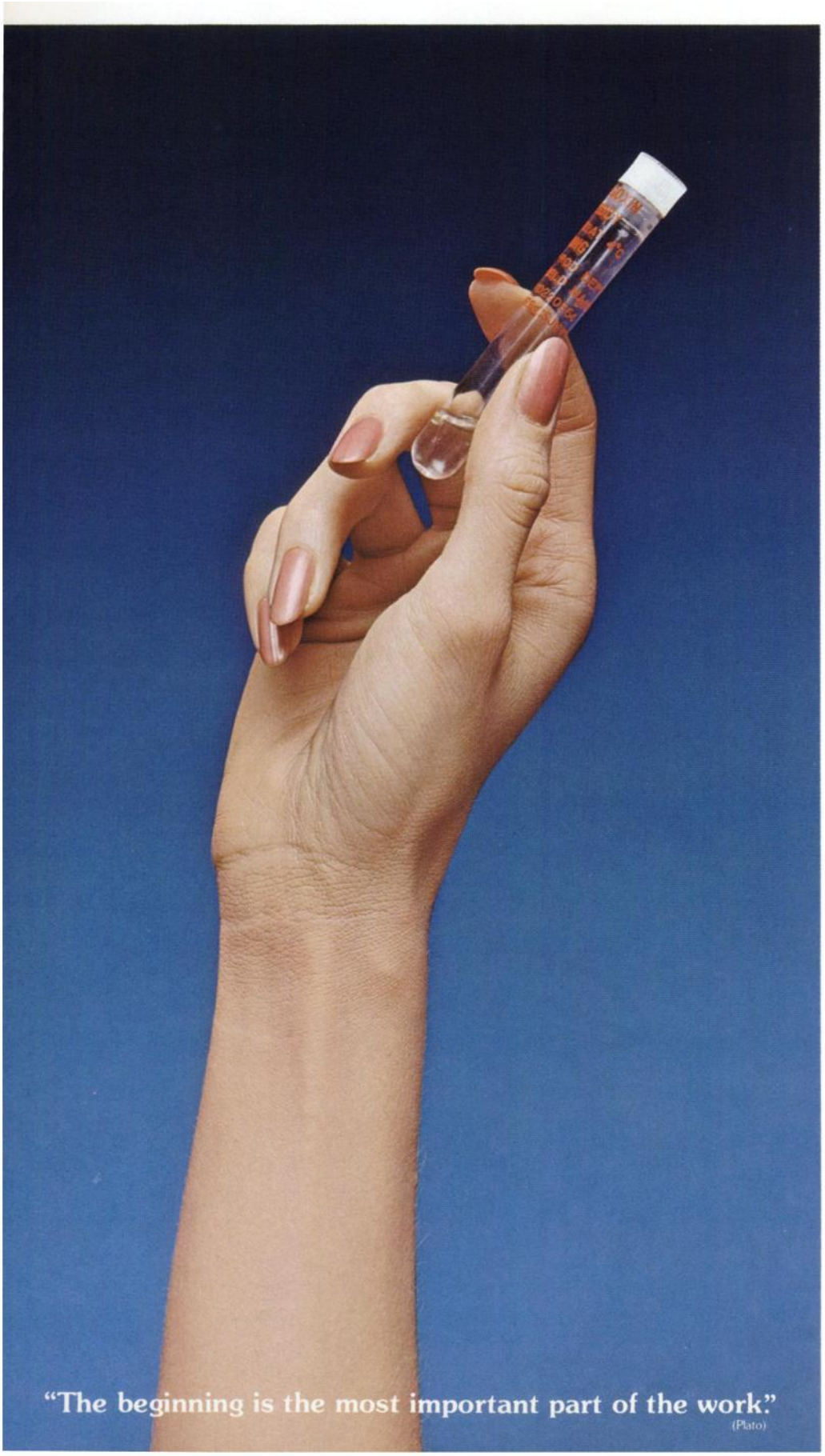

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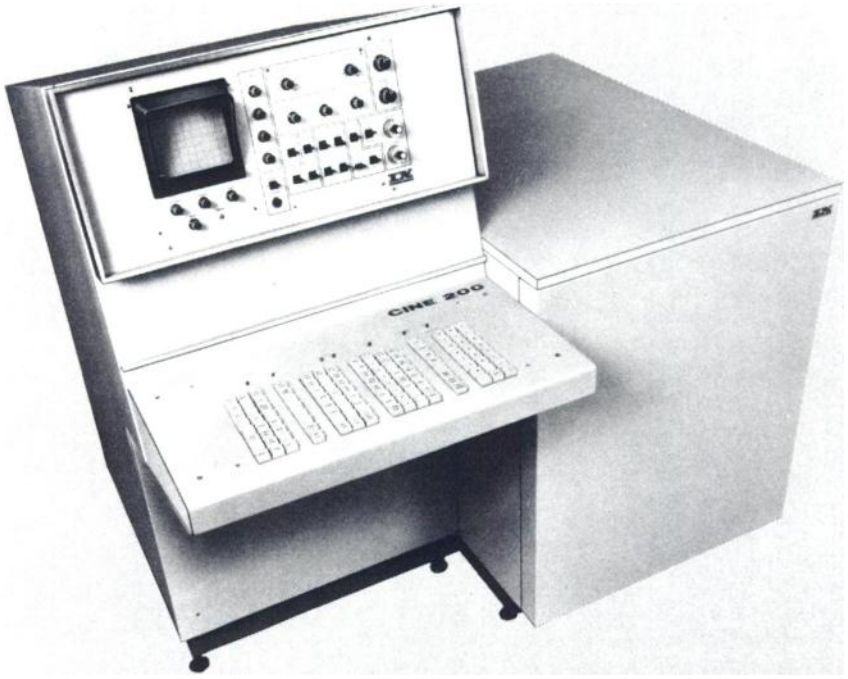

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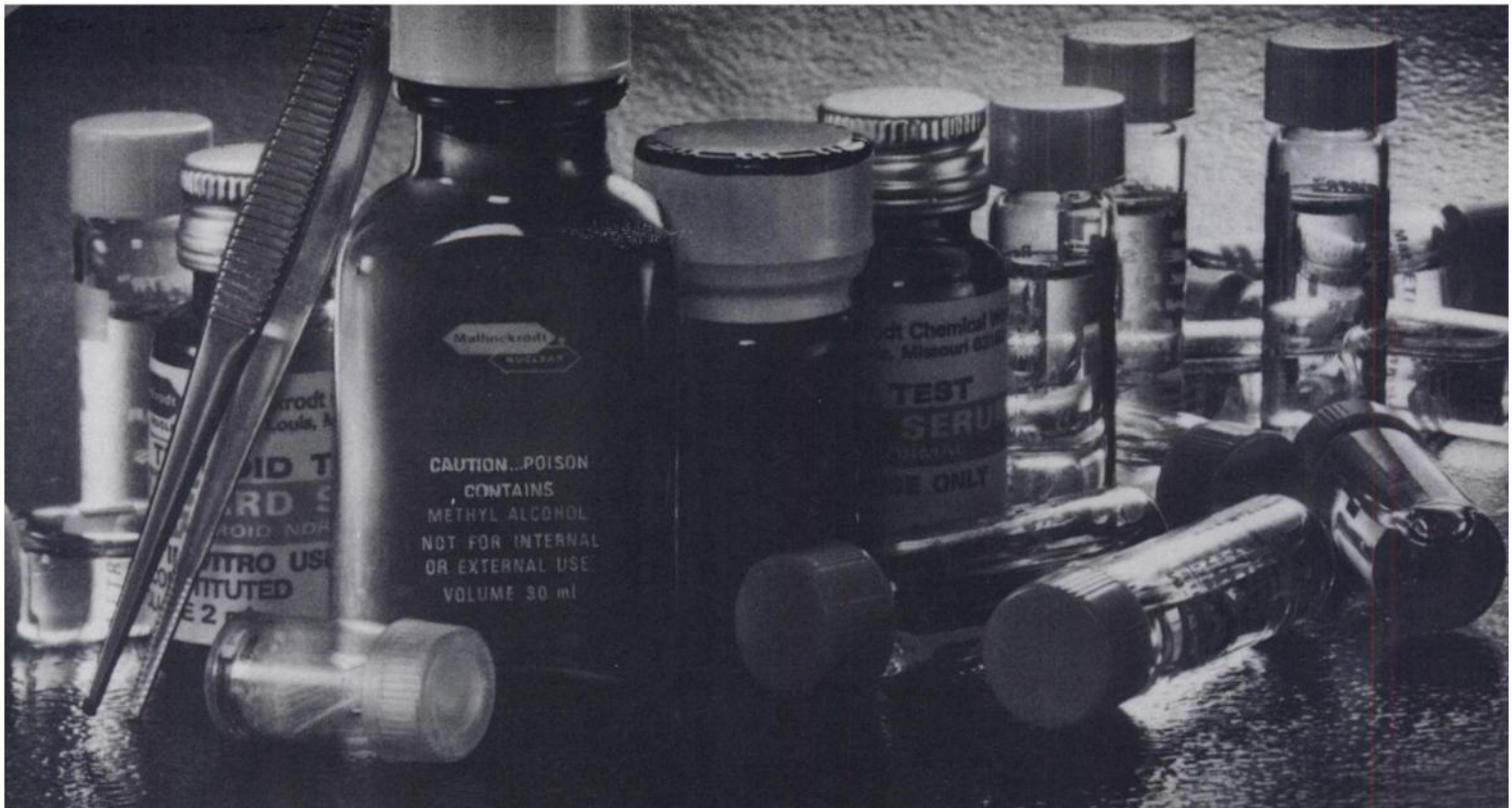

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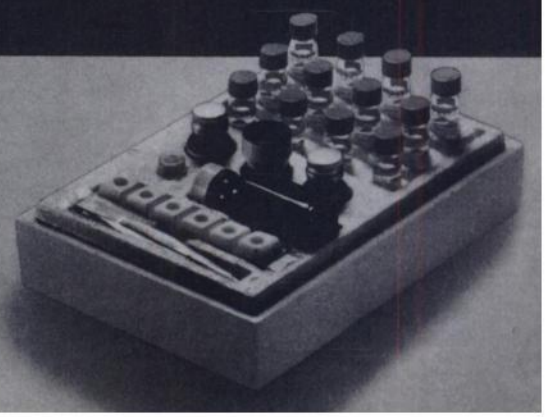

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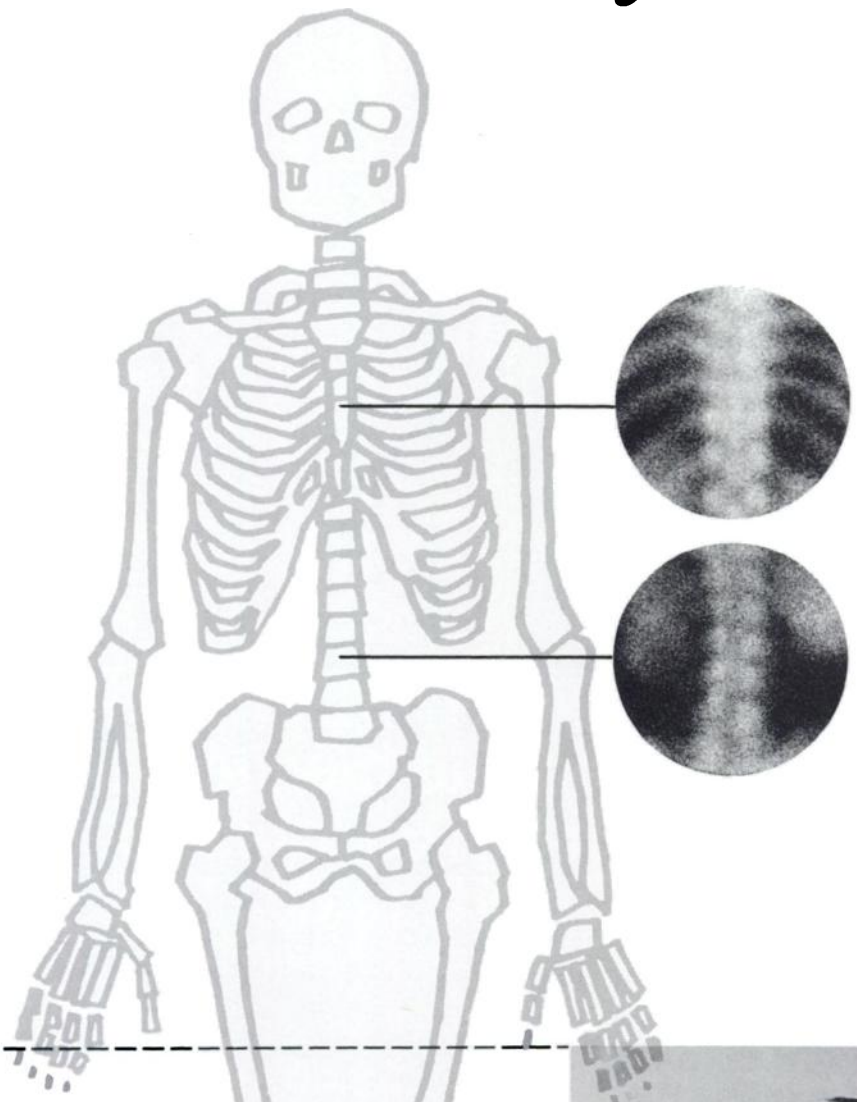

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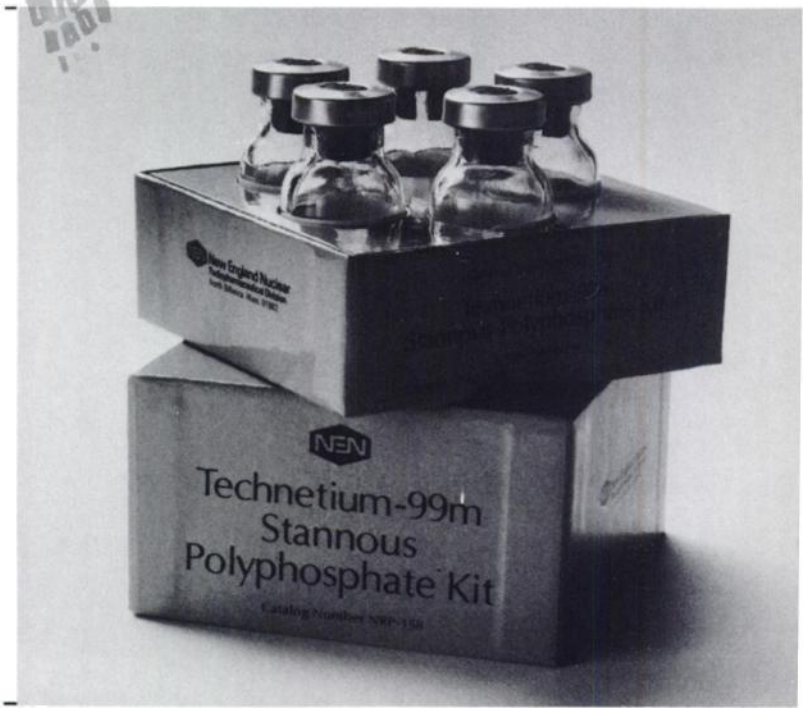

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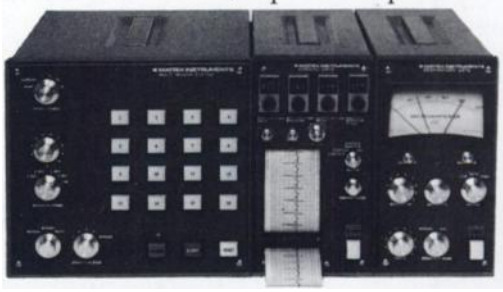

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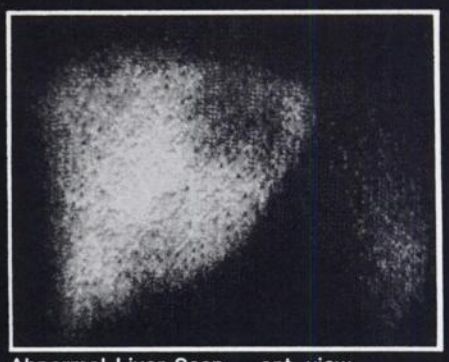
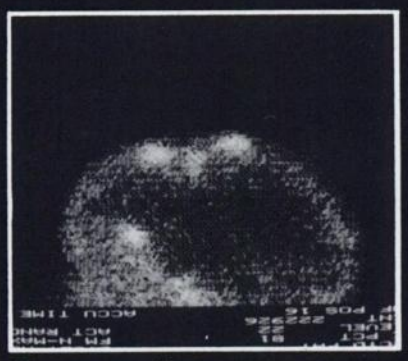
Isotope — 12mCi ^{99m}Tc
Total Counts — 806,899



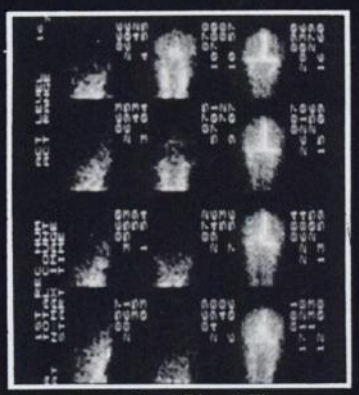
Abnormal Liver Scan — ant. view
Study Time — 320 sec.
Isotope — 2mCi ^{99m}Tc
Total Counts — 445,502



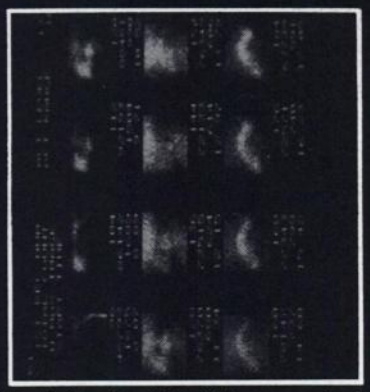
Brain-Bone Scan — left lat. view
(abnormal foci in the convexity and orbit)
Study Time — 240 sec.
Isotope — 6mCiTc Polyphosphate
Total Counts — 222,926

Normal Thoracic and Lumbar Spine Scan
— post. view
Study Time — 480 sec.
Isotope — 6mCiTc Polyphosphate
Total Counts — 1,000,733

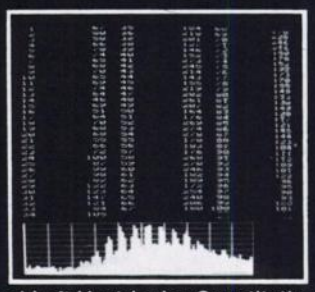
Dynamics



Normal Cerebral Blood Flow —
post. view
Accumulation Interval — 0.5 sec.
Display Interval — 1.5 sec.
Peak Counts per sec. — 26,210
Isotope — 15mCi $^{99m}TcO_4^-$

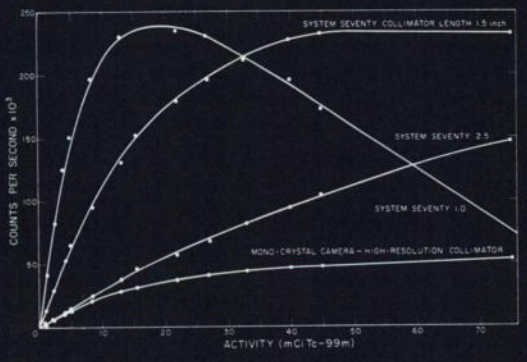


Normal Cardiac Blood Flow — ant. view
Accumulation Interval — 0.1 sec.
Display Interval — 1.0 sec.
Peak Counts per sec. — 78,147
Isotope — 15mCi $^{99m}TcO_4^-$



Normal Left Ventricular Quantitative
Histogram
Each double vertical line represents a
1.0 sec. time interval.
The entire histogram is 10.0 sec. long
and consists of 100, 0.1 sec. count
accumulations. This area-of-interest
histogram took less than 1.0 min. to
produce from end-of-study.
Note — definition of sinus rhythm of left
heart.

Performance



These curves provide a useful calibration of System Seventy. The observed count rate for 15 mCi of ^{99m}Tc for the 1.0, 1.5, and 2.5-inch thick collimators is 230,000, 150,000, and 45,000 cps respectively.

The count-rate curve obtained from a mono-crystal camera using the high-resolution collimator shows an efficiency about equal to that of the 2.5-inch thick collimator at low count rates and exhibited a saturation rate of about 40,000 cps. The same saturation rate has also been observed with the other collimators available for this type of system.

The efficiencies of the parallel-hole collimators are such that the saturation rate of 230,000 cps is observed with 15, 45, and 180 mCi of ^{99m}Tc with the 1.0, 1.5, and 2.5-inch thick collimators respectively.

System Seventy

or...

(how the unique combination of a programmed computer and a matrix detector allow you to practice the NOW and FUTURE art of nuclear medicine consistently, simply and reproducibly.)

Diagnostic Superiority

That's what you're really looking for. We routinely obtain 3-4mm. static resolution scans — regardless of energy. Dynamic studies can now be accomplished at high frame rates with count/unit time accumulations (at low dose rates) that are not achievable on any other gamma camera, and the results can be displayed or printed-out in histogram or numerical form within seconds of the end-of-study. That's diagnostic superiority!

Operation Simplicity

Our unique "back-lit" front panel reduces each operation to a logical-computer assisted-series of steps. Select the mode; i.e. Static/ Dynamic, and only those buttons or controls necessary to complete the study will be illuminated. That's operation simplicity!

New Standard!

The New Standard in diagnostic nuclear medicine. The only words that can describe a camera that is easy to use, delivers the greatest patient throughput, and provides the most technically superior diagnostic data while doing it.

No ONE of these terms really describes SYSTEM SEVENTY.

SYSTEM SEVENTY offers the highest spatial resolution, and that's why our static images are the best. This means that you can choose to increase patient throughput by selecting the best clinical measurement which optimizes spatial resolution and efficiency.

The system's high count rate capability (>200,000 cps) enhances the time resolution of dynamic studies which is a scientific necessity to achieve diagnostically meaningful evaluations of physiological time parameters. Stop thinking about the eventual possibility of more meaningful dynamic procedures and do them *now*, with SYSTEM SEVENTY.

And, the operational functions we've wired into the system and the software support we provide leave very little for you or your technician/operators to learn in putting SYSTEM SEVENTY to work and realizing the technically superior results.

So, looking back on them, certainly ALL of those terms apply, though no one of them really does SYSTEM SEVENTY justice.

BA BAIRD-ATOMIC

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Searle puts it all together...with the new Micro Dot Imager.

A new Multi Imager that produces up to 80 images on a single film.

It's taken us some time but at last we can offer Pho/Gamma users a display system that puts it all together. Gone is the expensive and tediously inaccurate pulling of Polaroids. Gone is the unreliable and complicated 35 or 70 mm mechanical transport system.

The new Micro Dot Imager electronically minifies and manipulates the images across the CRT screen and displays them on a choice of three different conventionally sized X-ray films... handled and processed with conventional techniques.

In addition the new Micro Dot Imager provides the following exclusive benefits.

Clinically Oriented

- Choice of either 5 x 7 or 8 x 10 X-ray film sizes as well as the competitively available 11 x 14 film size.
- Built in whole body imaging with choice of each view presented in dual intensity on the film to facilitate diagnosis or the more economical two views with single intensity.
- Highest cine sequential time per frame resolution of up to 80 frames/study.
- Organ-specific push buttons automate, standardize and speed the proper exposure settings for routinely performed studies.

Simplified Operation

- Light emitting diode (LED) display indicates system status and exposures available for format selected as well as exposures remaining on the individual film.
- Absolute exposure control insures consistent day to day and week to week exposure levels on a separate but built in high resolution, high uniformity CRT.

Economical Operation

- A variety of film sizes guarantees the lowest operational cost of any imager offered.
- System designed lightweight, low cost cassettes with future daylight unloading capability.
- Built in view-box saves space as well as steps.

And what's more, the Micro Dot Imager's inherent reliability is backed by a team of factory trained service engineers that perform on-site service for your total camera system. There is no longer any need to be concerned about system service responsibility, or here today, gone tomorrow..."pack it in the box and we'll service it at our factory" suppliers.

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