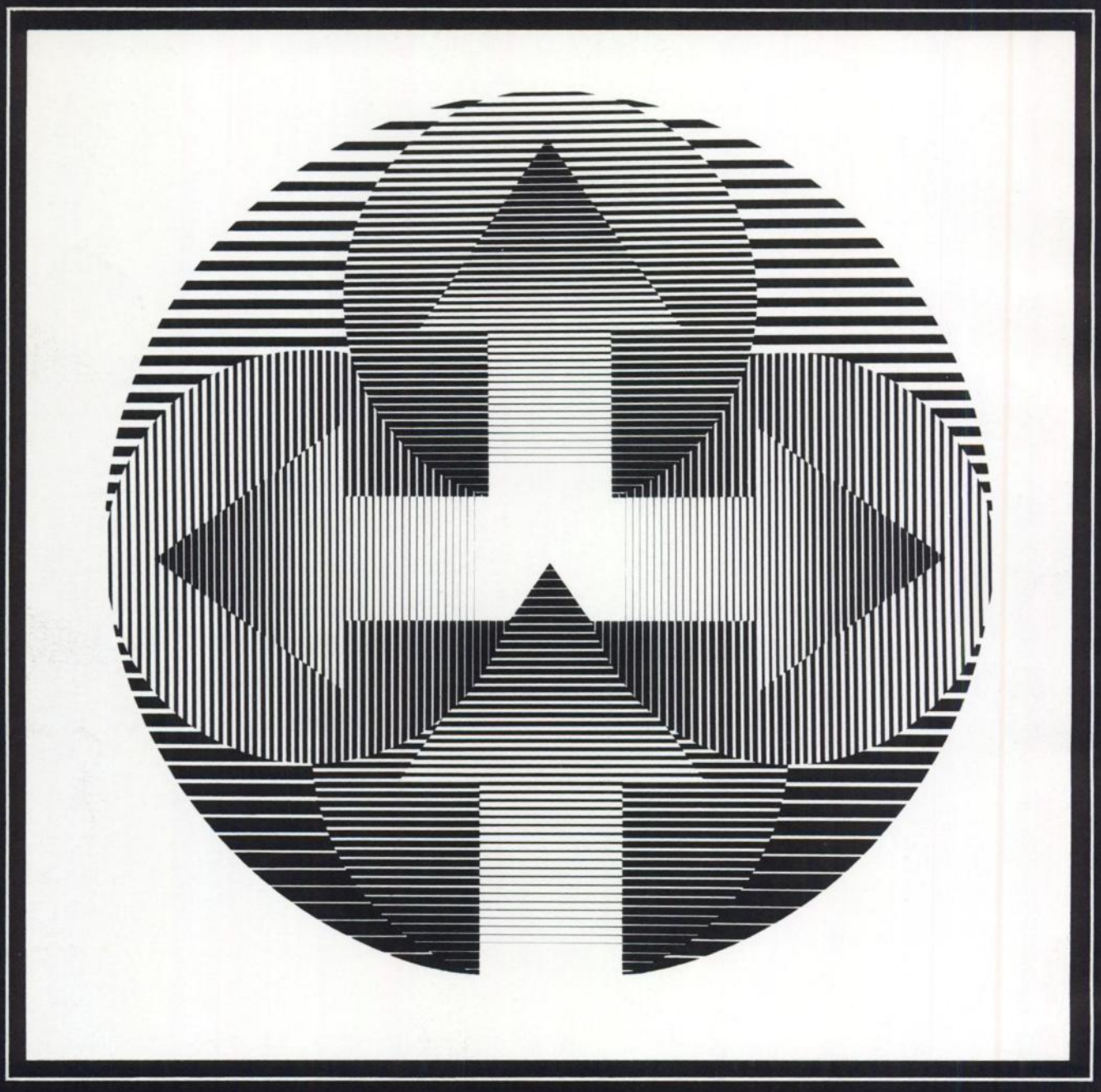
A Clinical Insight:

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).

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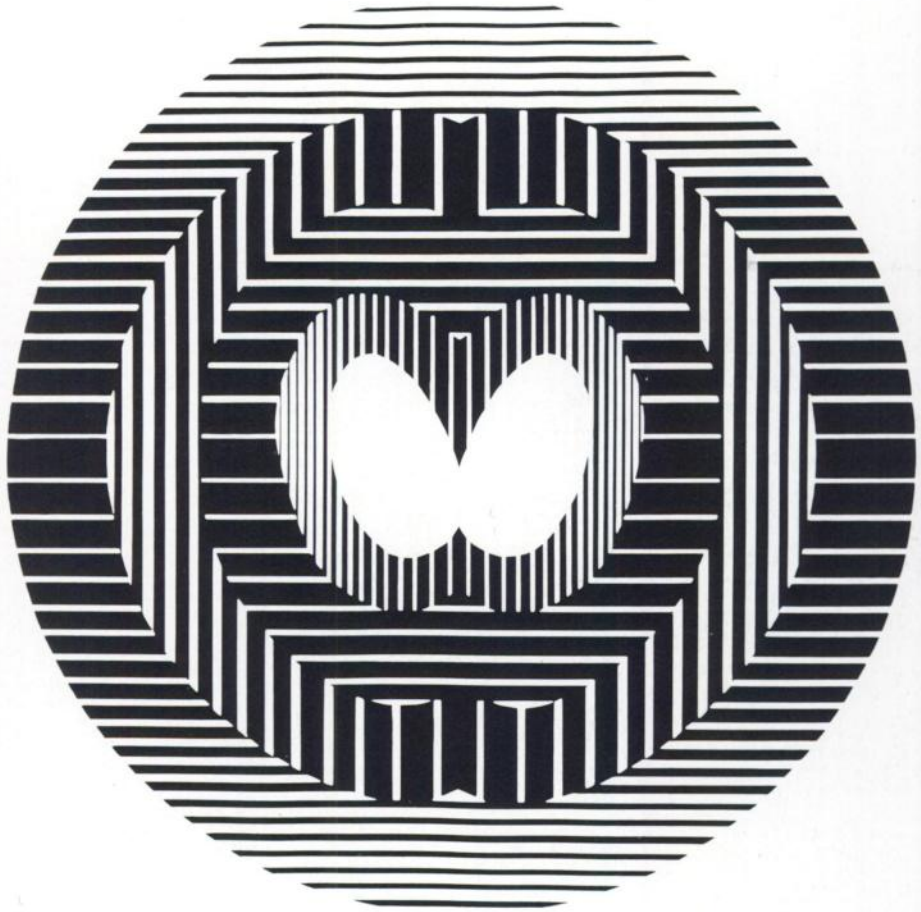
"Iodine 123 is a nearly 'ideal' radionuclide for thyroid imaging."[1]



In 1962, Myers and Anger stated: "Calculations indicate radiation exposures will be less than 5% as great when I-123 is substituted for I-131, in procedures where radioiodide ion is administered. This reduction stems chiefly from two properties: (1) I-123 emits no β-particles, per se, like I-131 does; (2) The ≈14-hour half-life of I-123 is only 7% that of I-131. However, this half-life is adequate for most diagnostic procedures."[2] ■ In 1973, Atkins concluded simply: "Iodine 123 is a nearly 'ideal' radionuclide for thyroid imaging."[1] ■ Medi+Physics makes Iodine 123 for delivery Monday through Thursday. Iodine 123 is limited by Federal law to investigative use only. For product and licensure information, call toll free (800) 227-0483 (outside California) or (800) 772-2446 (inside California).

1. Atkins et al, *Am J Roentgenol Radium Ther Nucl Med*, 117(1): 195-201, 1973. 2. Myers and Anger, *J Nucl Med*, 3(5):183, 1962.

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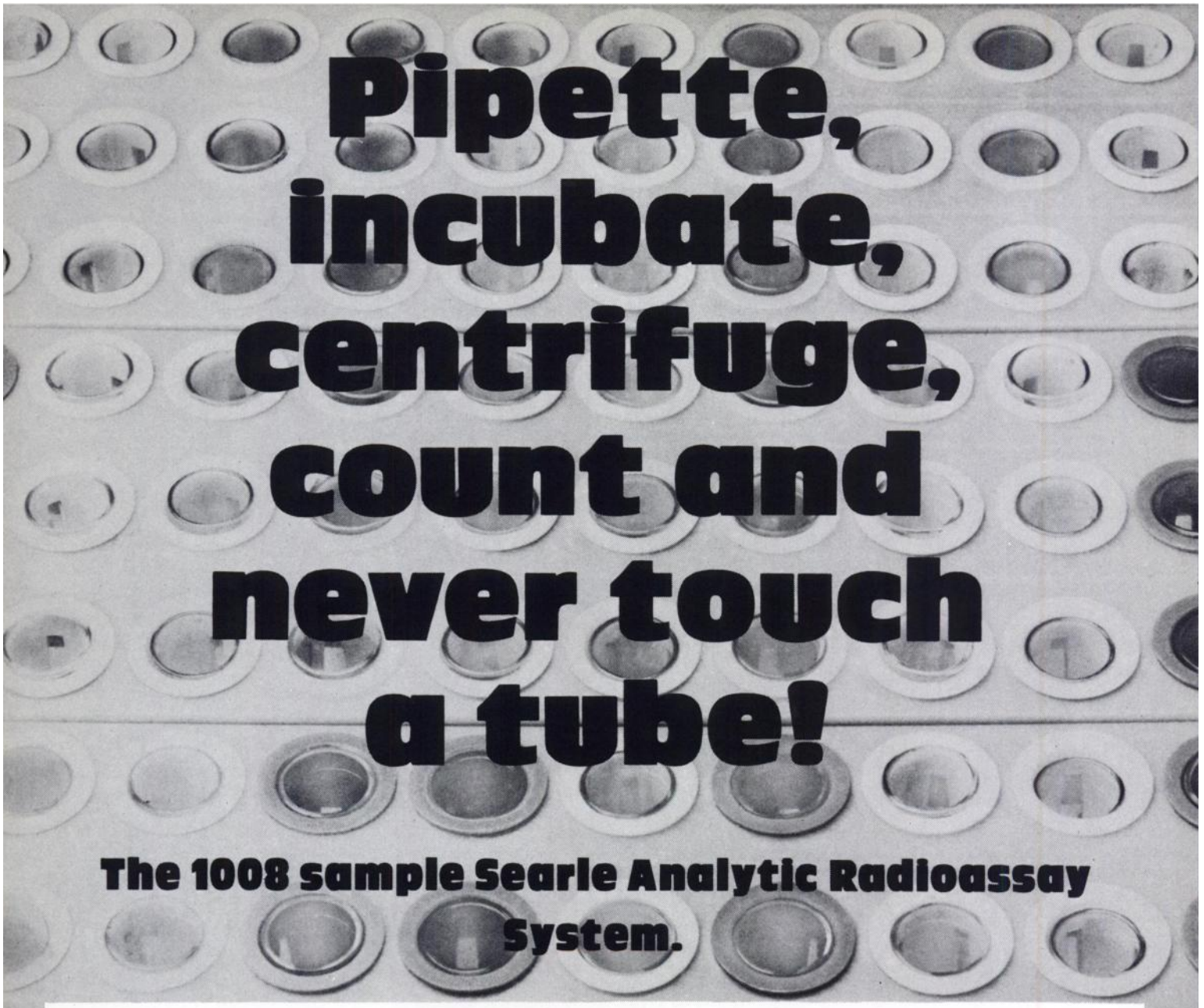

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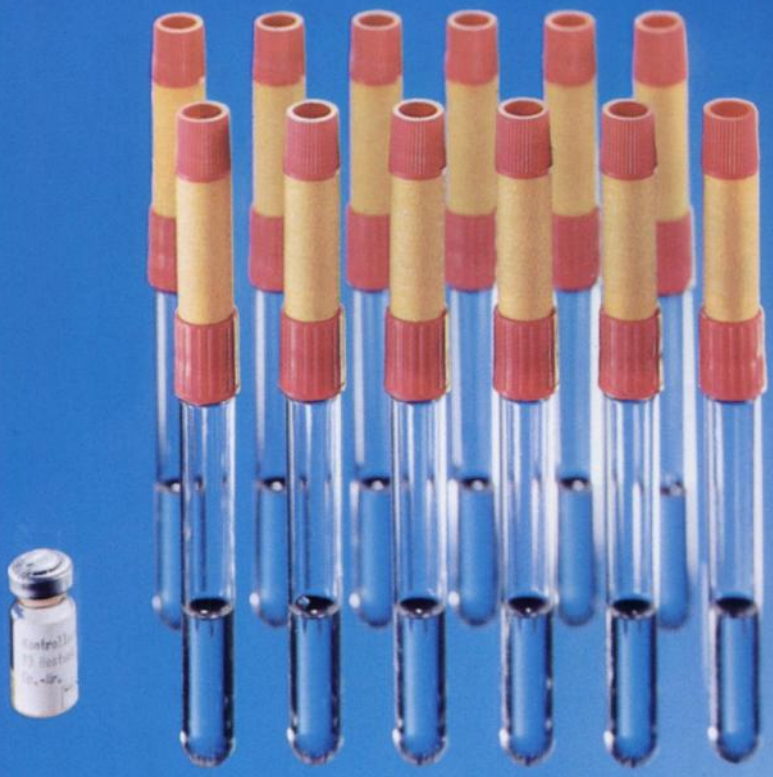

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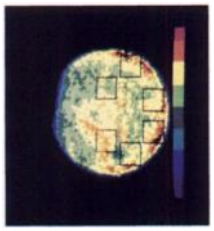
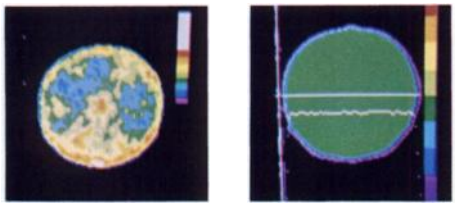
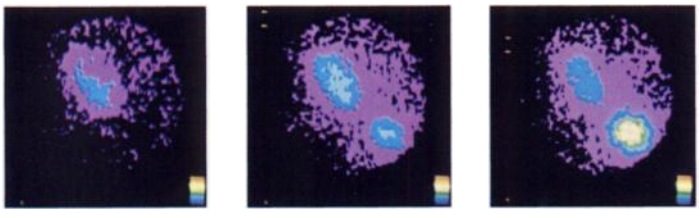


Six rectangular regions of interest defined for brain flow study.

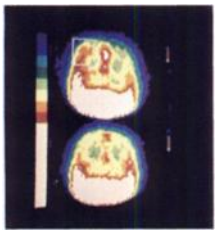
Elscint's advanced image processor displays static, dynamic or time function studies on a large color or black and white TV screen with color directly related to, and continuously updated by, radiation count levels. Display resolution is exceptional as a result of several built-in image enhancement features. This powerful system receives, processes and stores images with unexcelled speed in a broad variety of modes of operation. Its availability means that now you can see and do things never before possible in this field. But, even with its sophistication, Elscint has made it easy to use. No programming or computer knowledge is required and the simple operation is mastered by any technologist in 2-3 hours. Thus, you spend less time obtaining patient data and more time studying it. Look over the Image Processor's many features then write or call our nearest facility for detailed information.



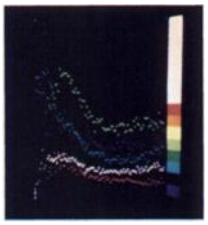
Flooded field image before and after uniformity correction.



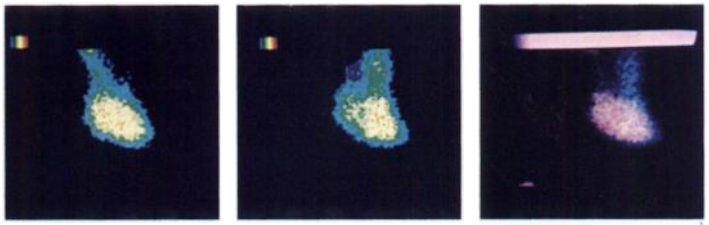
Dynamic study images of clearance by transplanted kidney.



"Brain Tumor" in uncorrected display eliminated by uniformity correction.



Multicolor Histogram time function display of cardiac study over five regions of interest (96 frames).



Bolus of ^{99m}Tc-Albumin entering right atrium (left frame) and leaving (center frame). On the right, superimposed dual color display of the two frames.

image processor to your the most precise patient data

ADVANCED DATA PROCESSING AND LARGE COLOR DISPLAY FACILITATE PRECISE PATIENT DIAGNOSIS.

Processed count information is displayed in 8 colors or monochrome shades of black. To maximize image resolution and permit study of small details the Elscint Image Processor offers several image enhancement features.

• Two unique calibration techniques correct image artifacts resulting from non-uniformities in the electronics of the camera. • Statistical variations in the image can be reduced by an on-line smoothing function. • Images at low count rates can be strengthened by adding as many as 99 frames to the display. • Color elimination pushbuttons blank colors for isocount line determination. • Background subtraction clarifies image appearance. • In dual-isotope studies, off-line subtraction can be performed by pushbutton with the process in view on the TV screen. All these features add up to the sharpest, most accurate, easy-to-read display of patient count data.

MODULAR DESIGN PERMITS SYSTEM EXPANSION AT LOW COST.

Elscint's Image Processor is comprised of a camera interface, the videodisplay and one of three data processors. The lowest priced processor is designed for static or slow dynamic studies. The two more complex systems offer the added capability to perform fast dynamic studies plus several additional modes of operation. The most advanced of these two systems enables complete time function data analyses to be done. It includes a built-in mini-computer (8K, 16 bit; 32 bit optional) and a complete battery of clinical programs. Time function data are displayed on a scope and printed out on a teletype or optional line printer. Thus, with no programming knowledge you can study regional blood flow, cardiac output, mean pulmonary transit time, clearance rates, rhenography, and so forth. All systems are fully compatible with one another and each can be expanded with any of several available options to give you supplementary image processing capability as required.

LARGE FAST-ACCESS MEMORY SPEEDS IMAGE RETRIEVAL.

Up to 200 discrete (400 optional) images are received and stored on a magnetic disc at a rate of up to 10 frames per second. Average search and readout time for stored images is only 5 ms in forward or reverse — a real timesaving feature in multiple frame reviews. Dual disc memory cartridges speed date manipulation and leave original data untouched. Frame acquisition can be by preset limits or by physiological triggers which can also be used for time delay photographs.

SIMPLE PUSHBUTTON OPERATION FREES YOU FOR DATA ANALYSIS.

Use of the Elscint Image Processor may be learned easily in just a few hours by any of your technologists. Built-in safeguards prevent accidental loss of data and lighted buttons keep track of all processing underway. Image enhancement activities are noted with lighted indicators for each frame. Study and patient data for each image is easily entered and is thereafter displayed concurrently with the image.

SIX REGIONS OF INTEREST MAXIMIZE DATA EVALUATION.

Six fully-positionable overlapping areas which appear on the screen, plus output from two external scalers may be selected for further digital evaluation. Time function histograms for all regions are displayed simultaneously, each in a different color.

SYSTEM OPTIONS EXTEND APPLICATIONS.

A computer interface is available, an optional larger capacity magnetic disc extends the system's memory to 400 image frames, an optional twin memory is available for dual isotope studies, a telephone interface permits communication with similar remote processors and a camera facilitates obtaining permanent records of displays.

Note: Information given refers to several different Image Processor Systems. All models do not include all features described.

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This, one of the three top scintillation cameras, weighs 1300 lbs. less than the other two.

(And if you think that's trivial, you have a surprise coming.)

Now why in the world would anyone ask you to focus your attention on gross weight (of all things!) when considering a piece of sophisticated instrumentation like a scintillation camera?

Because, as we hope you'll soon come to agree, low weight tells you something. As a matter of fact, it really tells you a great deal because technologic progress almost always leads to a dimunition of both size and weight (e.g., from vacuum tubes to transistors to integrated circuits). Thus, the functionally equivalent instrument that weighs substantially less than others, bespeaks a newer design. And so it is with the Nuclear Data Radicamera.™ This quite remarkable camera weighs about 1300 lbs. less than the other two fine competitive instruments. (Mind you, only 1300 lbs. as compared to 2600 lbs.—a 50% weight reduction!)

Ah, but what did we leave out? Functionally, nothing. We simply designed out the older technology, both electronic and mechanical, that tends to weigh more and bulk larger. And the newer technology, with its lesser weight and size, is often more reliable. And *that's* a nice bonus.

What else does Radicamera offer? A full capability camera with resolution as good as the best (really), and operating ease that defies comparison. You can actually position it with one finger and, with the appropriate accessory, move it easily to the patient that can't be moved easily. The innovative design yields a more compact unit that occupies less of your ever-evaporating space. In toto, a superbly designed instrument that is easy to live with and yields diagnostic data second to none.

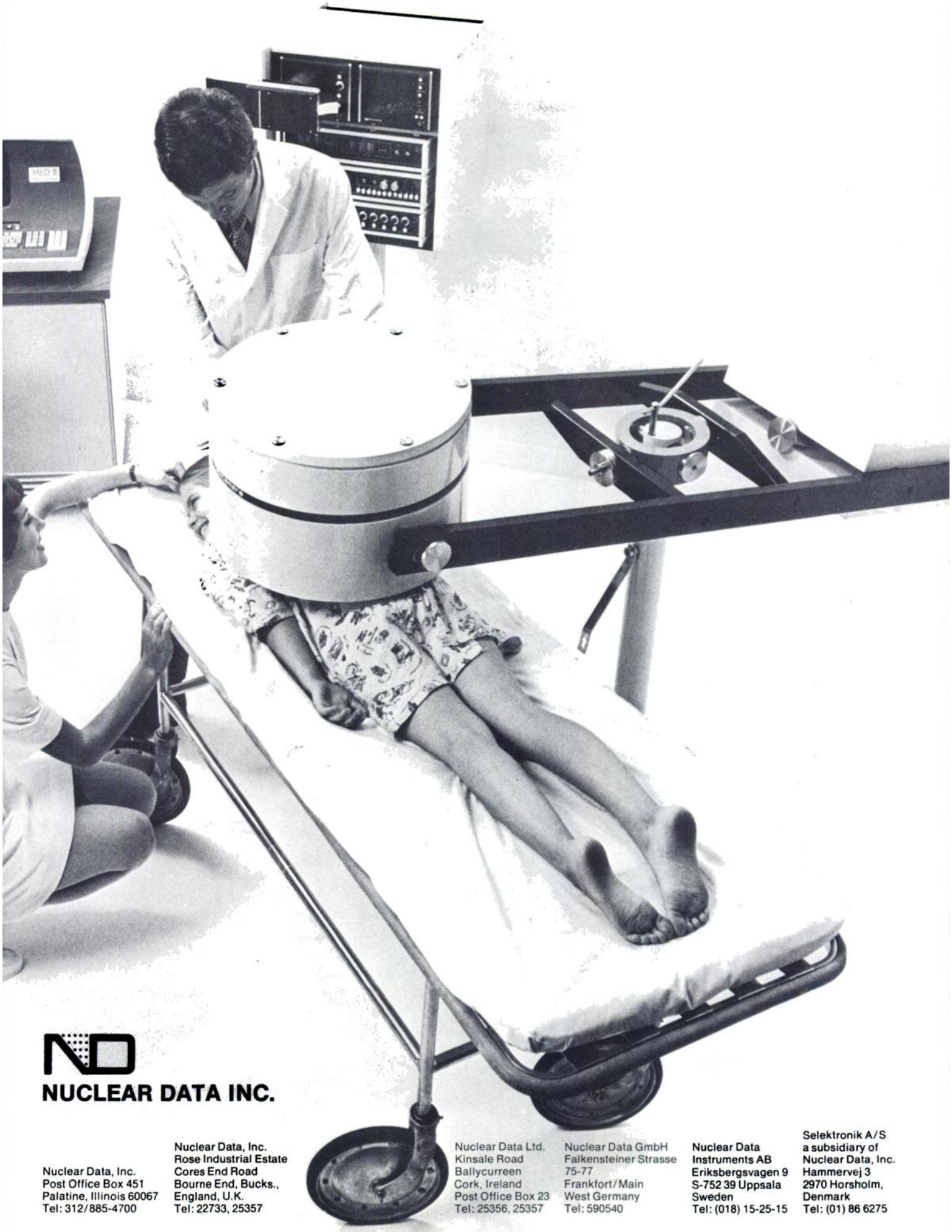
Finally, we should also mention the following: newer technology not only tends to diminish size and weight. It shrinks cost (and hence, price) too. Check it out.

So, if you're looking at cameras, consider this: we want you to speak to Radicamera users because you really ought to hear our story from someone else, too. Contact us for names and for Radicamera literature.

A word about Med II™

Very revealing fact: Med II is the world's best selling image processing system. And although we're happiest when its coupled to our Radicamera, candor forces us to reveal that it also functions beautifully with those other cameras. This very flexible system does everything a computerized image processing system should do. Things like correcting for non-uniformities, curve smoothing and fitting for cardiac output studies, ejection fraction and xenon ventilation/perfusion computations, acquiring and storing dynamic data from 12 regions of interest to produce 12 curves simultaneously, and much more. And its ready-to-use, conversational and upgradeable software makes it ideal for both routine and investigative dynamic function work. Once again, we invite discussion with current Med II users.

Radicamera: the lightweight that really isn't.



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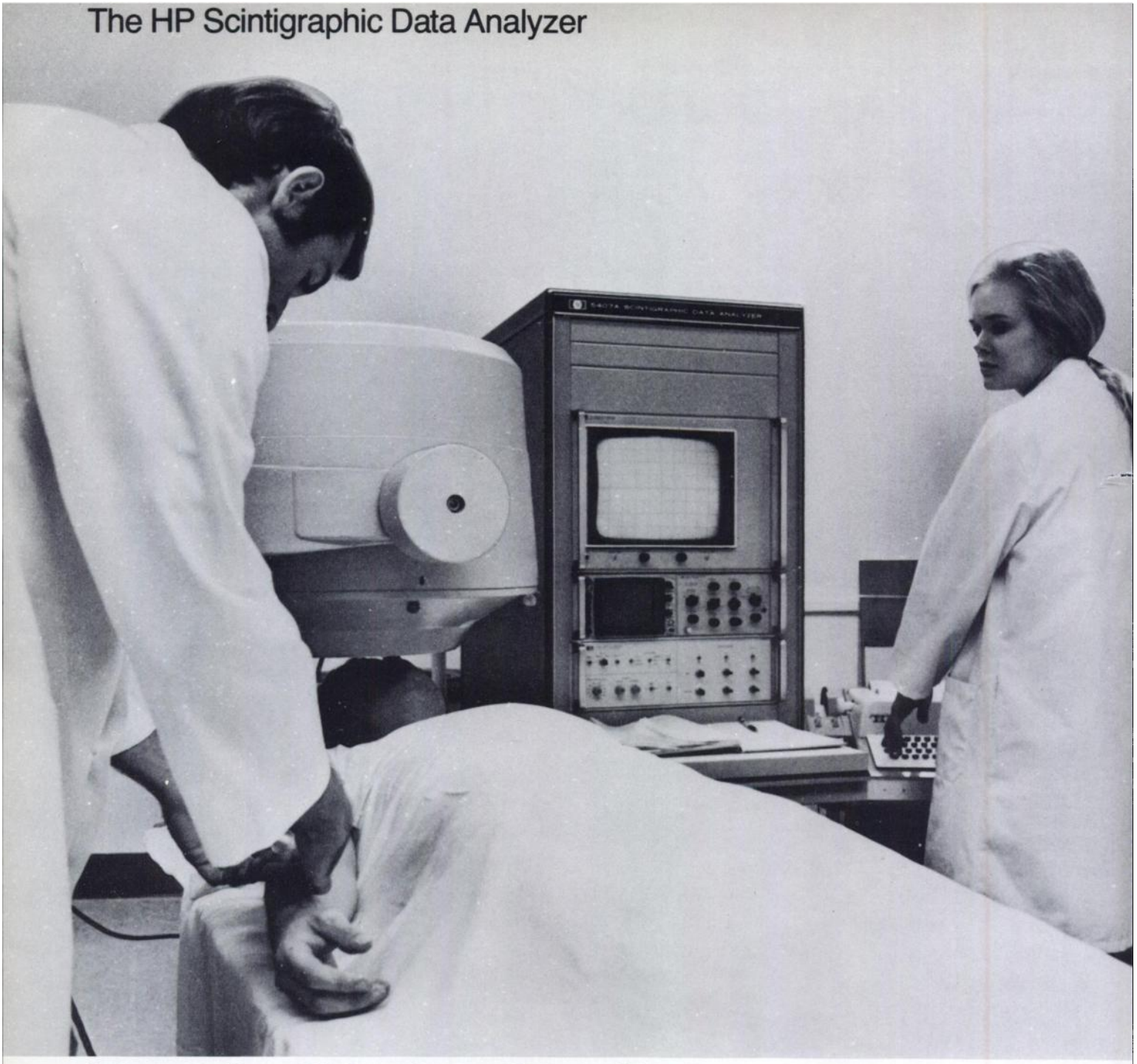

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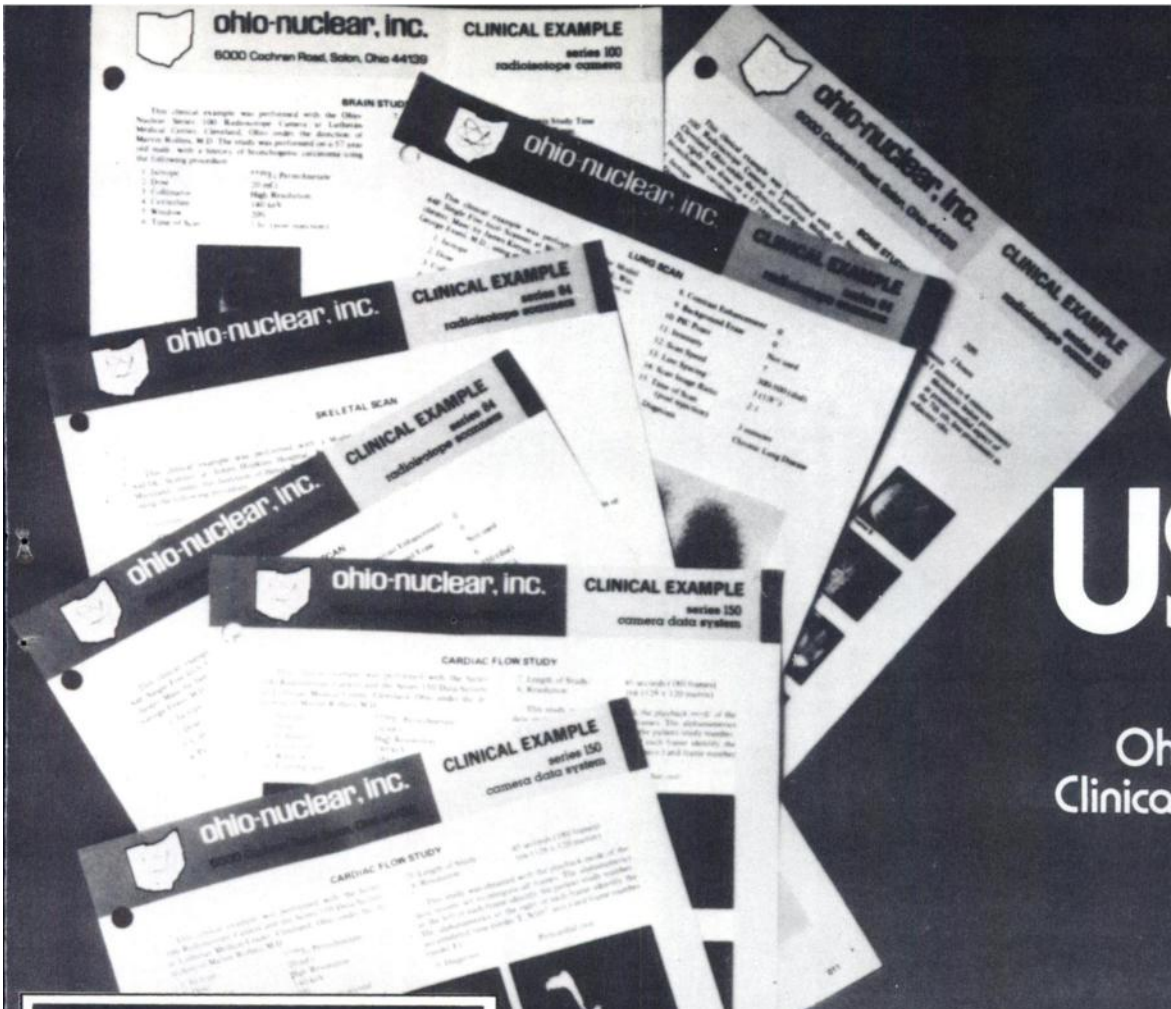

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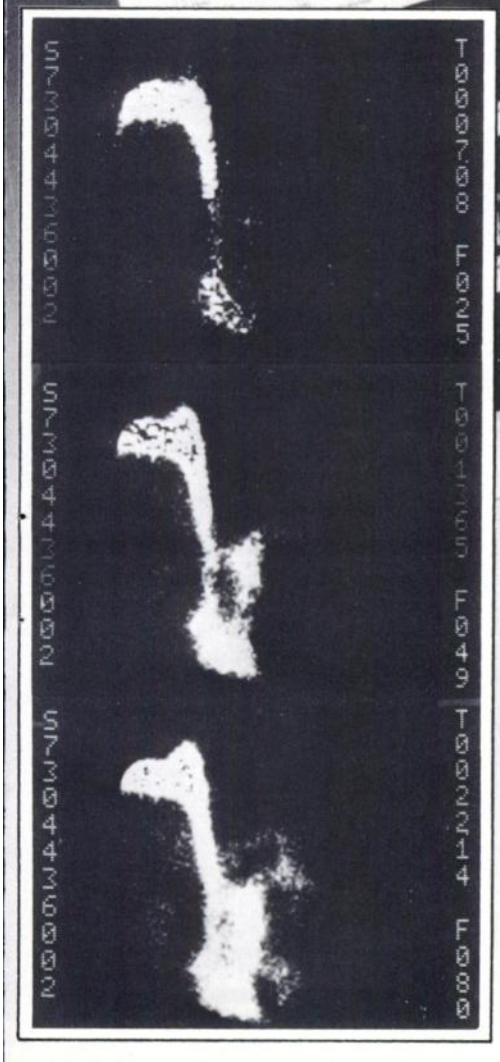
Ohio-Nuclear's Clinical Example Program



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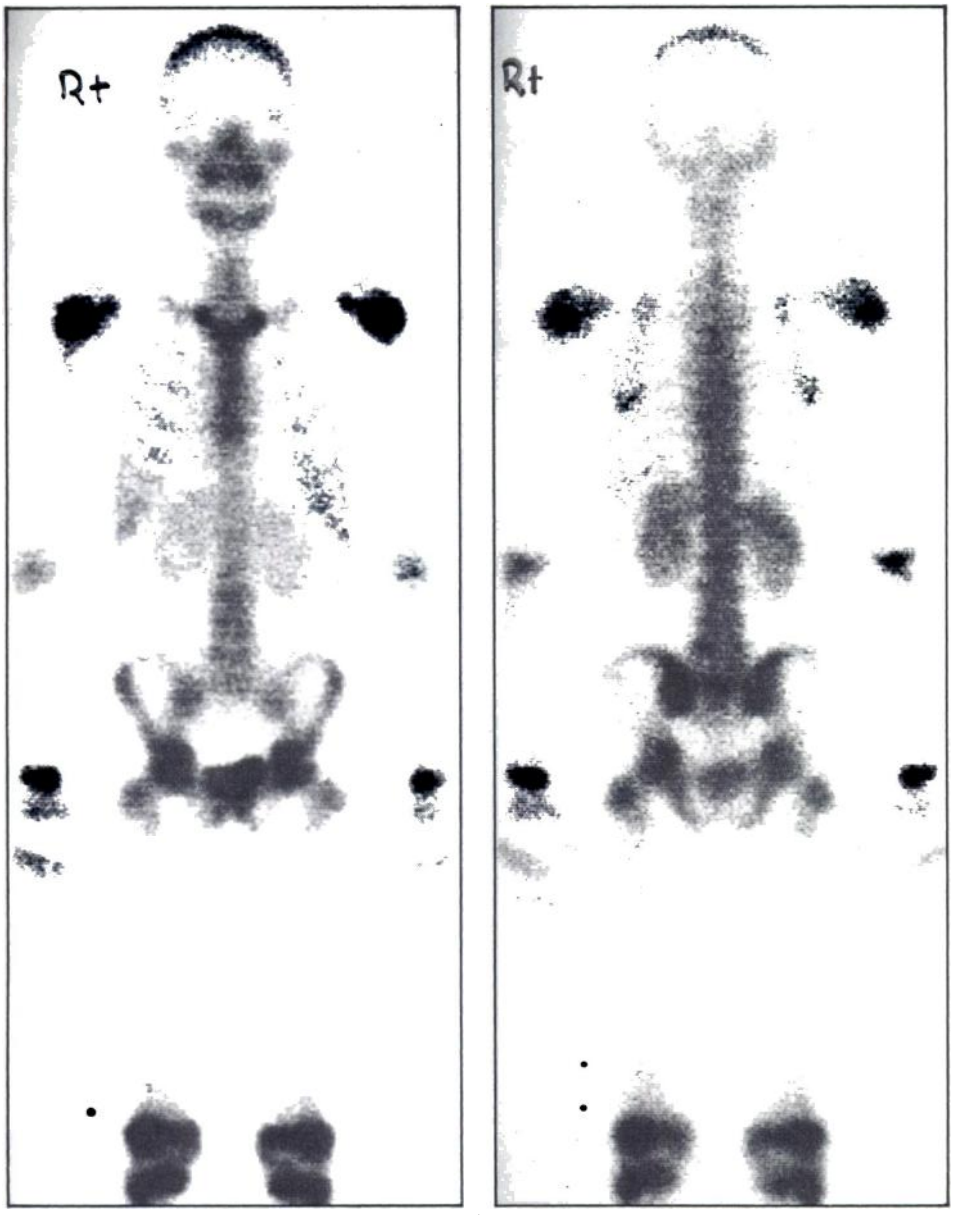
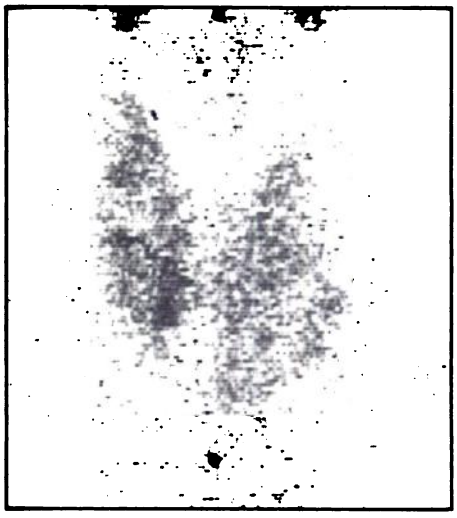
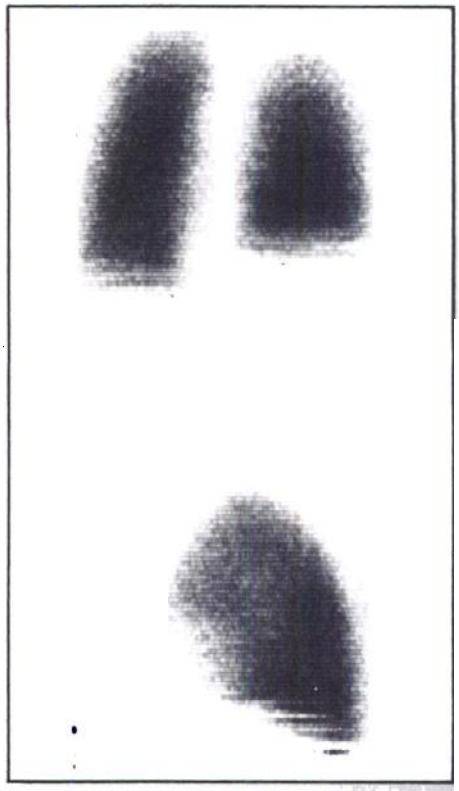


12-year old boy—3:1 minification.



Enlarged thyroid.



Lung or liver/spleen studies easily done because of 24 inch field of view.

Maxiscan™ whole body scanner: proven in-hospital performance you can see.

the more it makes sense.

If you're considering the use of a gamma camera and attachments for whole body scans, you should be aware of an interesting phenomenon. What begins as two to three whole body scans weekly soon mushrooms to three or more per day. And while the camera is tied up with these scans, other exams are delayed. Department scheduling can be woefully disrupted.

Consider the GE alternative. The Maxiscan™ two-probe whole body scanner. One patient position. A single pass delivers two coincident views for more definitive diagnostic information. And, instrument component cost analysis demonstrates lower cost per scan.

Skeletal surveys cover a full 24 x 80 inches. 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 views 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.

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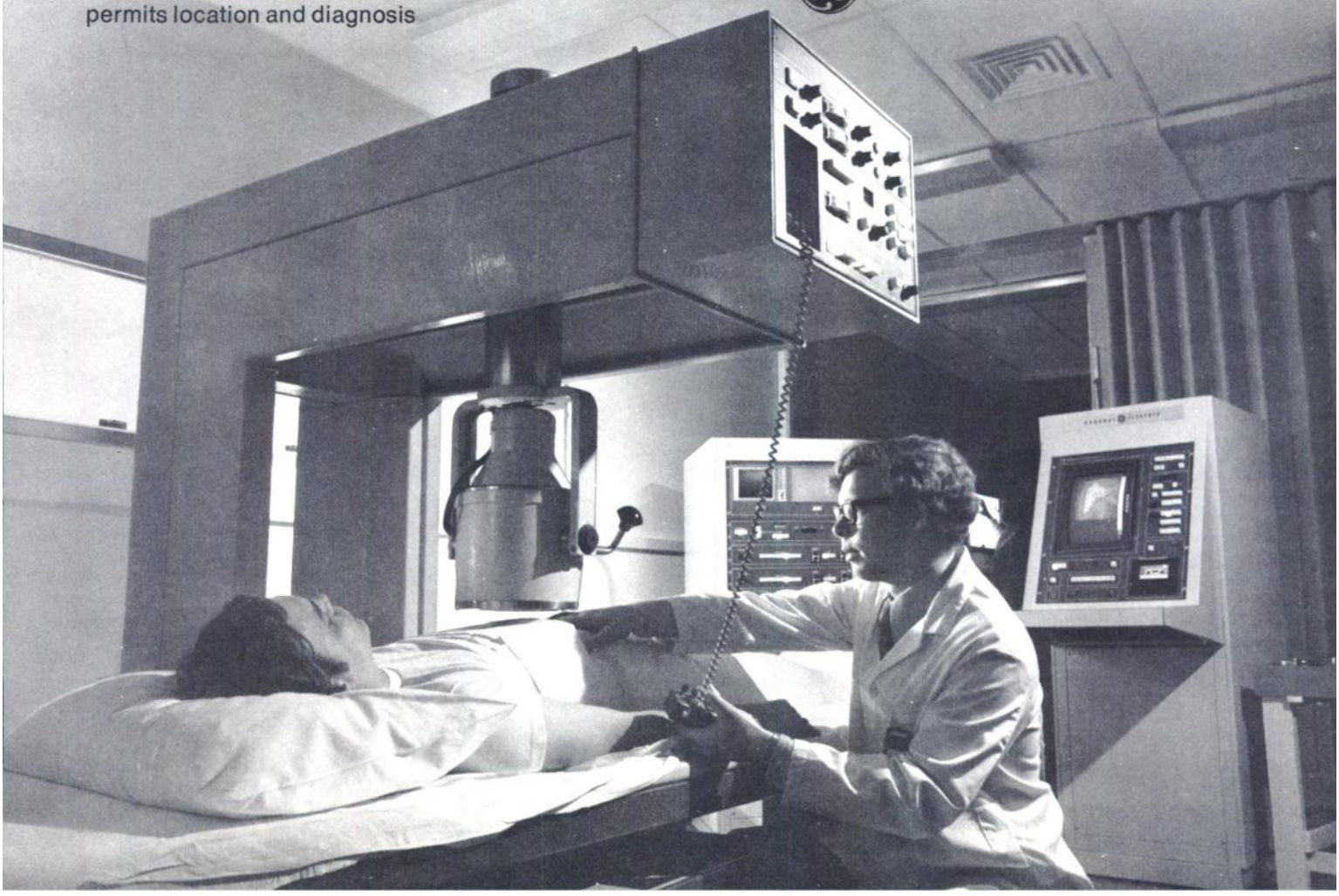

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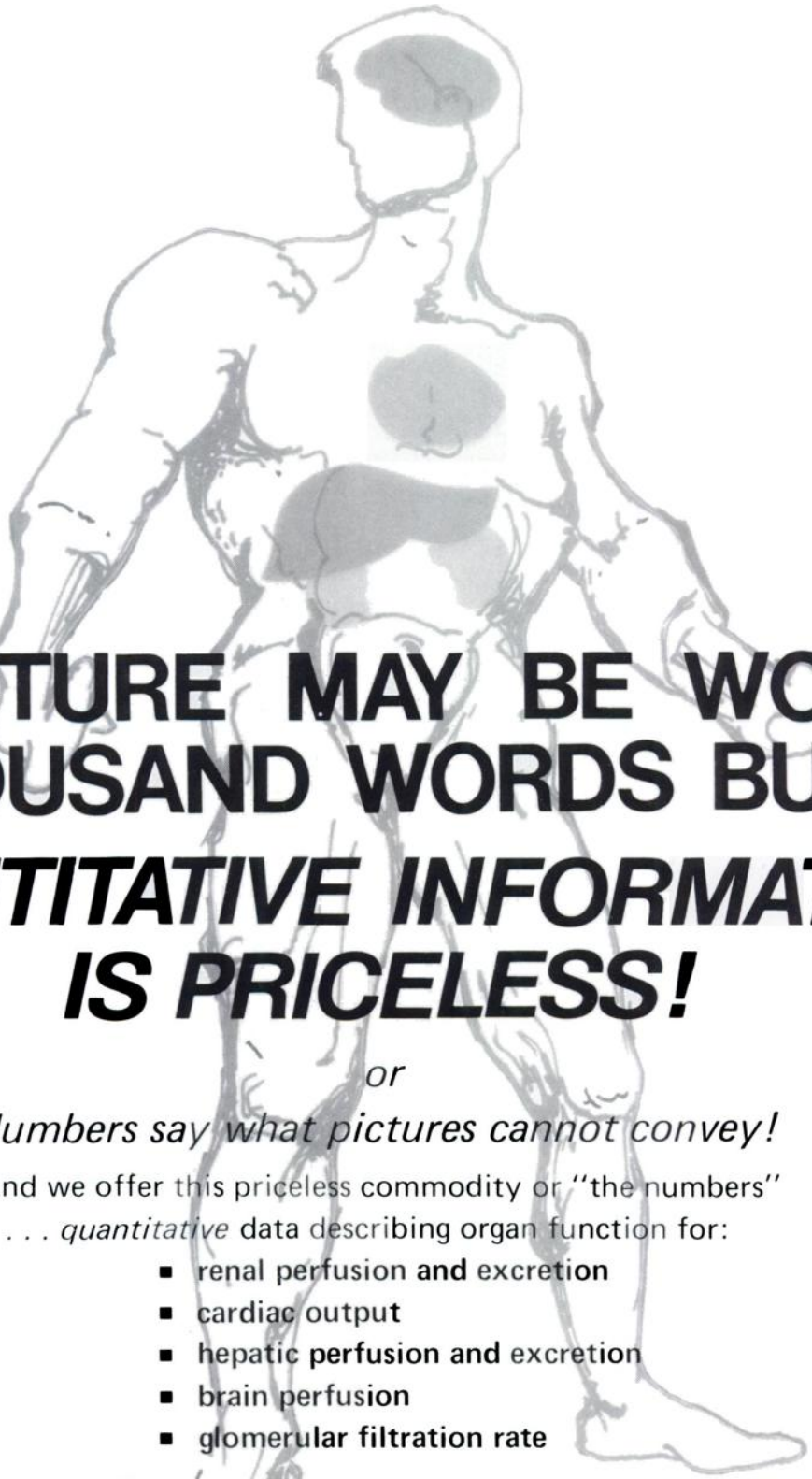

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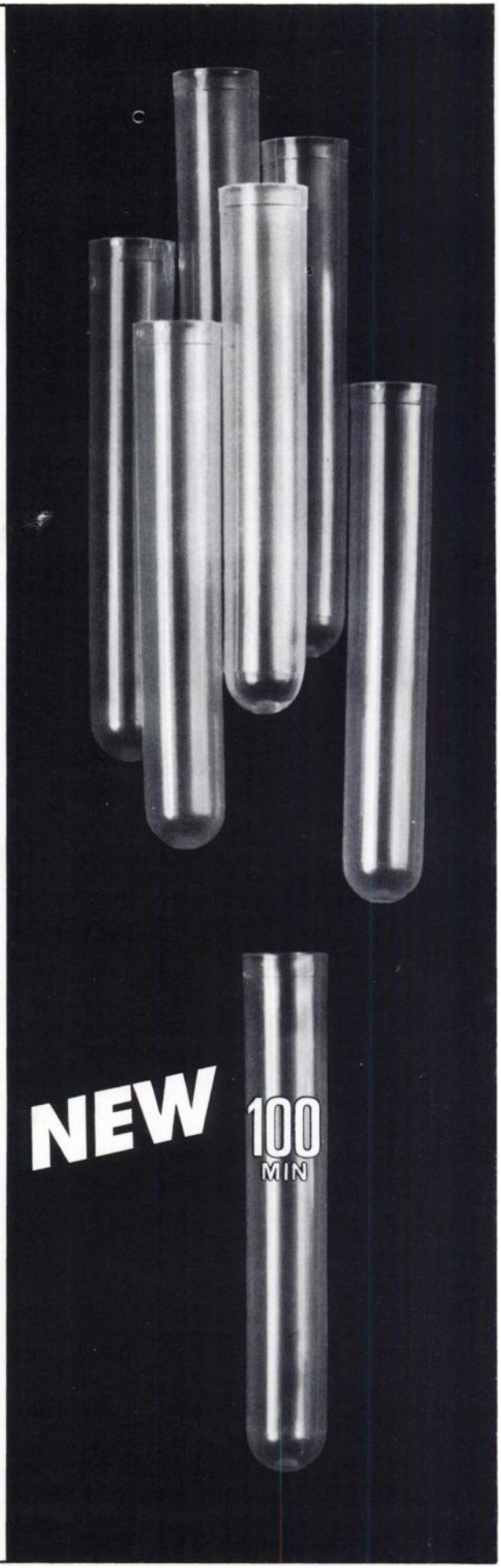

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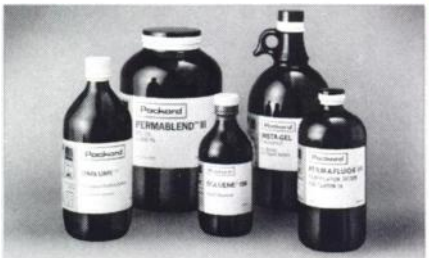

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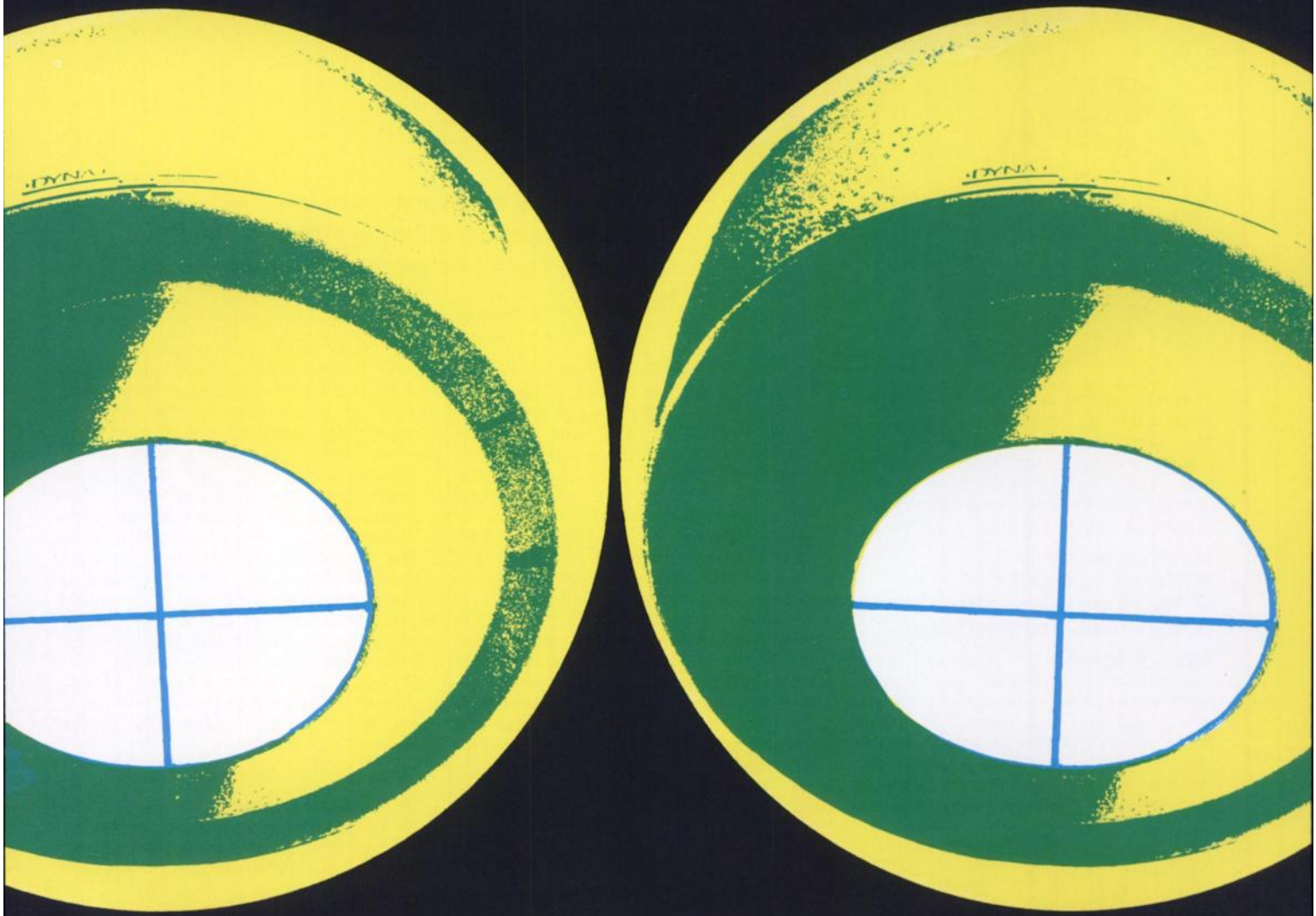

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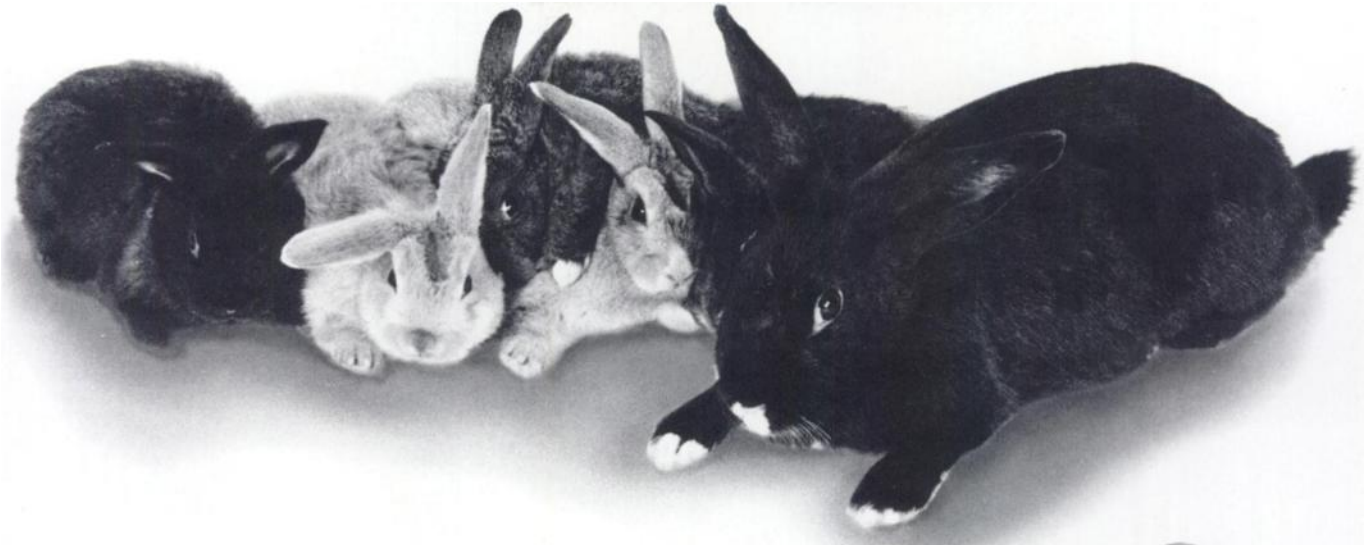

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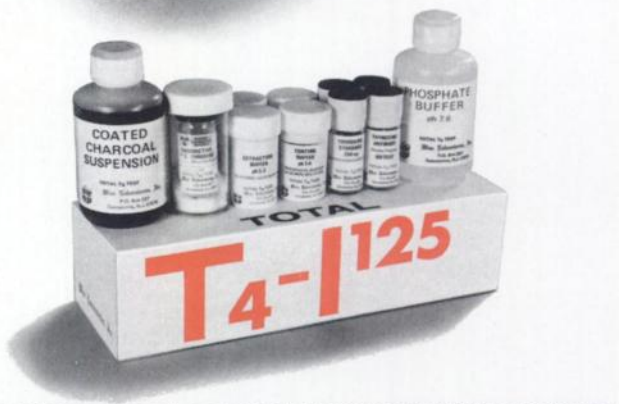

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1. Dunn, R.T. and Foster, L.B.: Radioimmunoassay of thyroxine in unextracted serum, by a single antibody technique, **Clinical Chemistry 19**:1063, (September) 1973.

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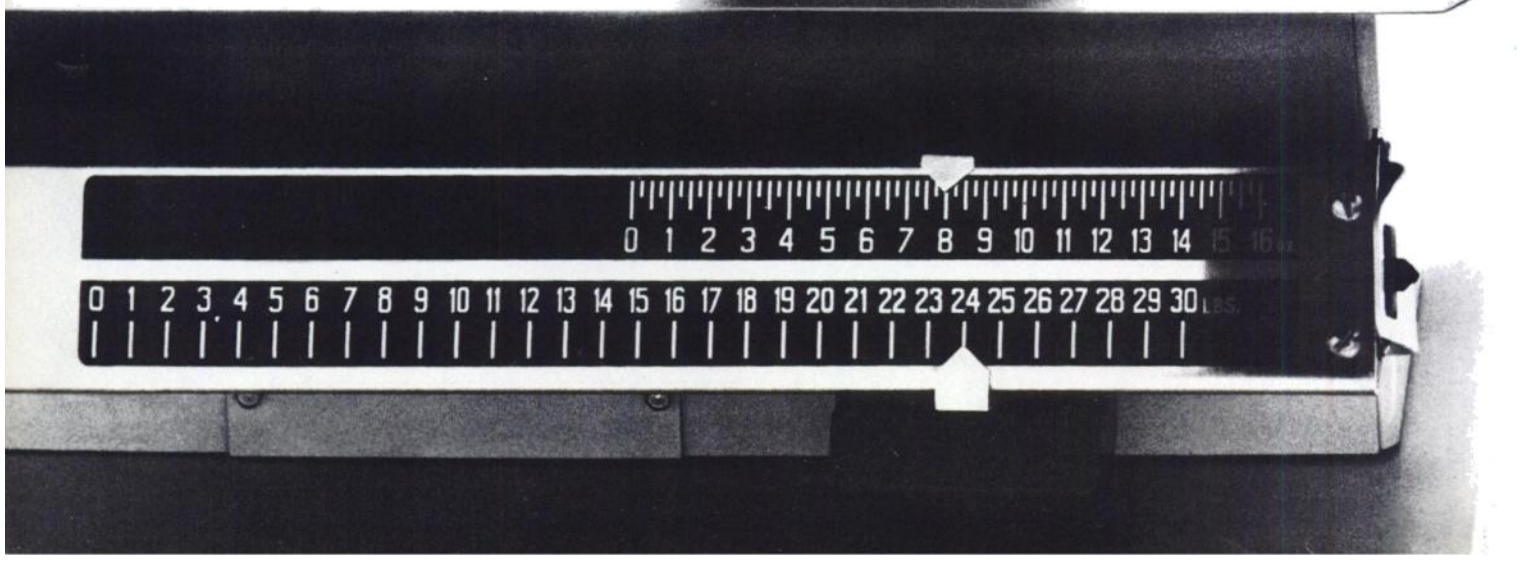

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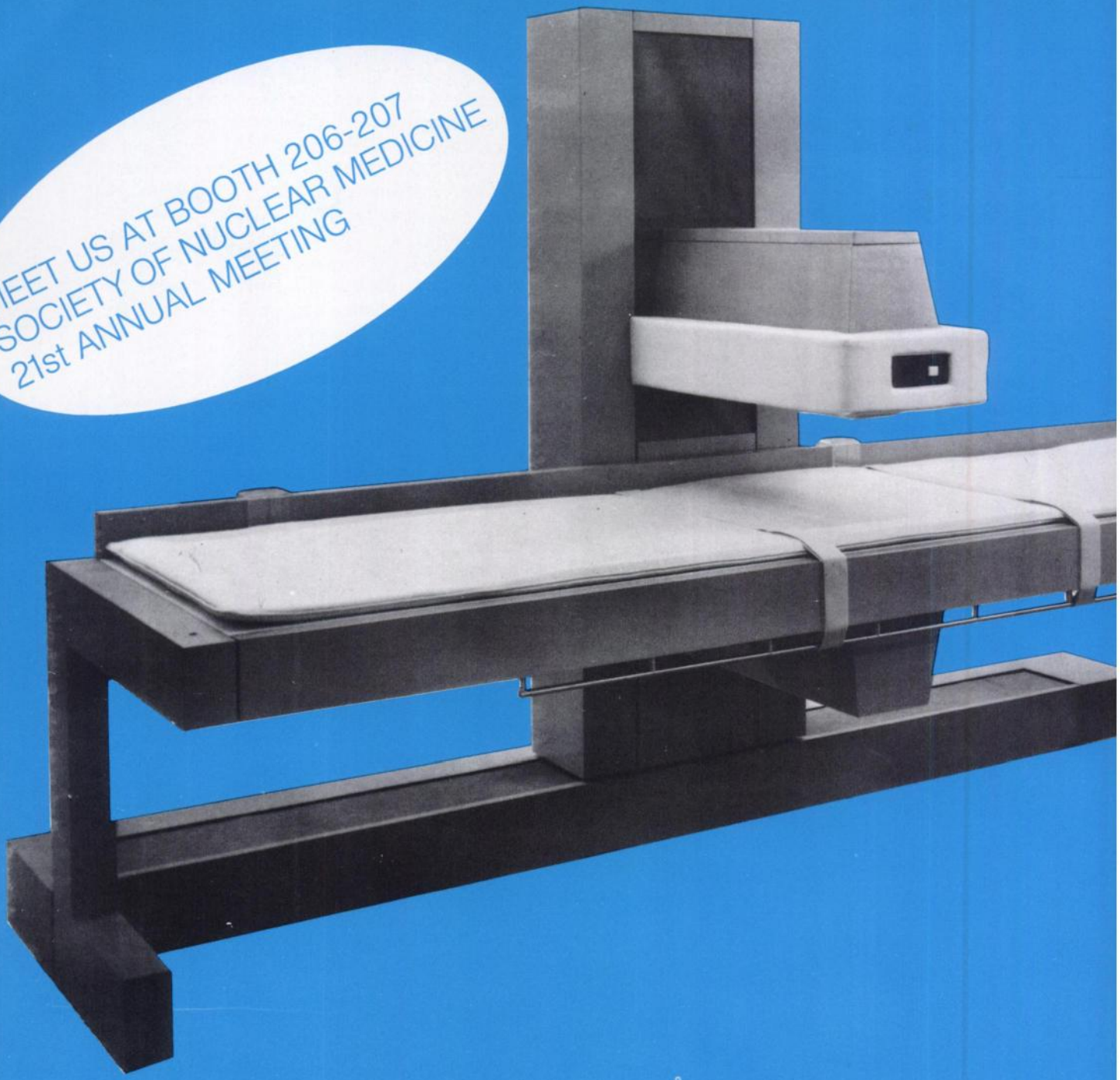

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Carcinoembryonic Antigen assay

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

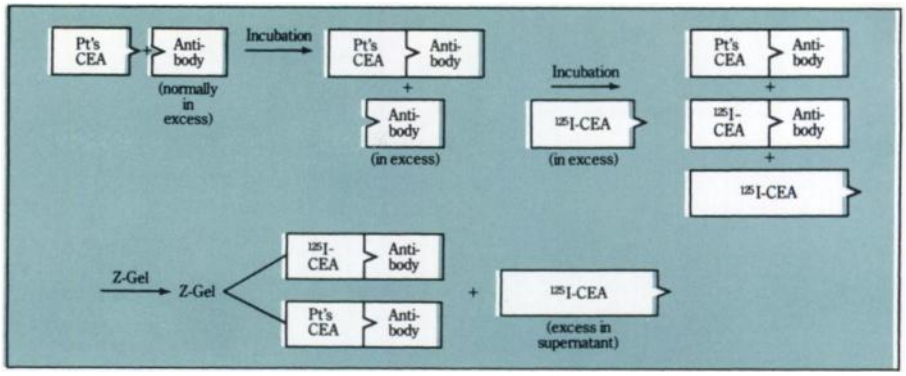
Each kit contains CEA antiserum, CEA standard, ^{125}I-CEA, EDTA buffer stock solution and zirconyl phosphate gel (Z-gel). All components are supplied in excess to assure sufficient material for at least 100 tubes (or for approximately 40 patient plasma samples assayed in duplicate with the necessary 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:

1. Third Conference, Carcinoembryonic Antigen (CEA) Test Collaborative Study, Hoffmann-La Roche Inc., April 21, 1973
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12. Moore TL, *et al: JAMA 222*:944-947, 1972
13. Hansen HJ, *et al: Human Pathology*, In Press

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☐ CEA-ROCHE Clinical Monograph

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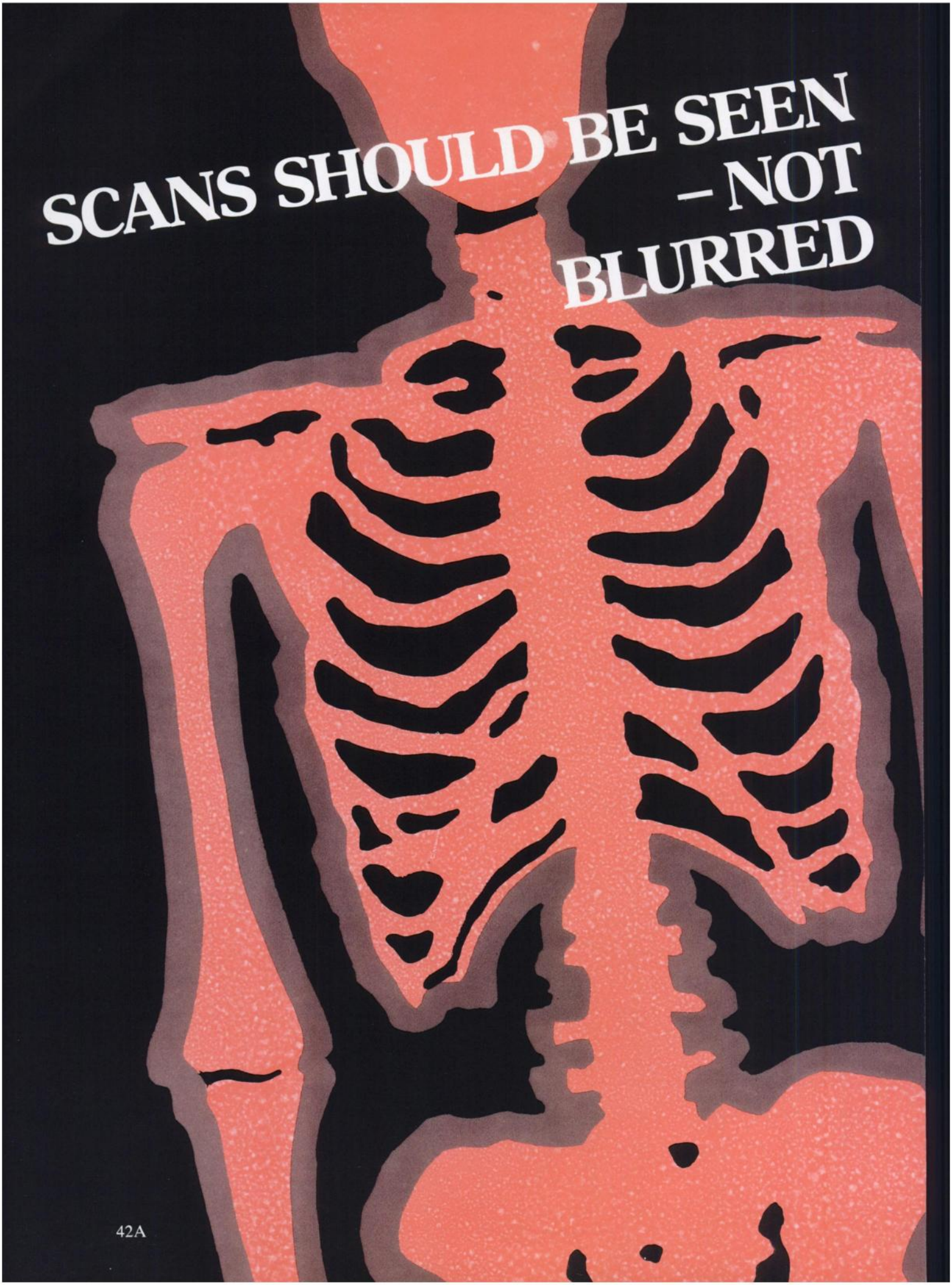
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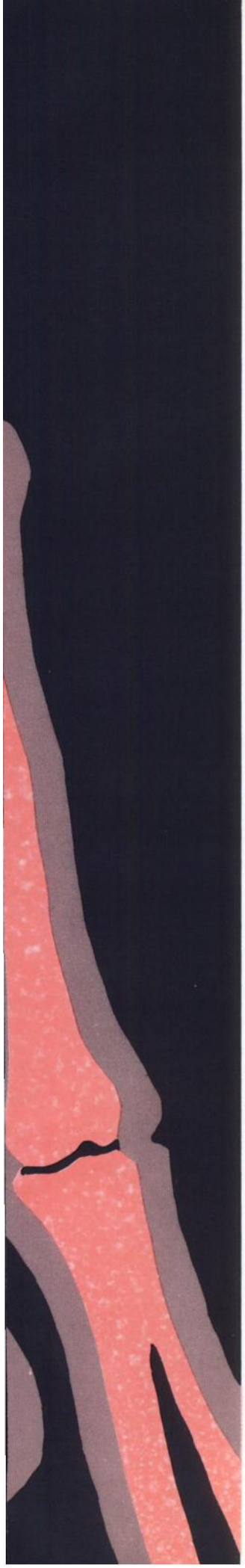

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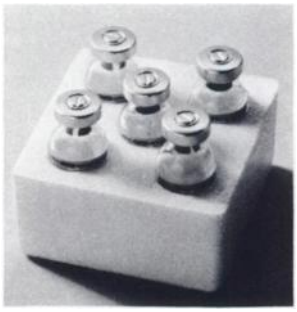
TechneScan™ PYP™ KIT

(STANNOUS PYROPHOSPHATE)

A MOST SUITABLE PHOSPHATE FOR SUPERIOR BONE IMAGE QUALITY

A superior bone imaging agent because:



- It is a consistent product
- It clears the bloodstream fast
- It gives high bone-to-tissue ratios
- It very seldom produces liver visualization
- It provides for a variable dose-to-scan time
- It gives high initial tagging efficiencies
- It is stable both in-vitro and in-vivo

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.*
2. Ackerhalt RE, Blau M, Bakshi S, Sondel JA: A Comparative Study of Three ^{99m}Tc-Labeled Phosphorous Compounds and ^{18}F-Fluoride for Skeletal Imaging. J Nucl Med 14: 375, 1973 *Abst.*
3. Bok B, Perez R, Panneciere C, DiPaola R: Bone Scanning Radiopharmaceuticals: A Comparison of Three Products. J Nucl Med 14: 380, 1973 *Abst.*

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

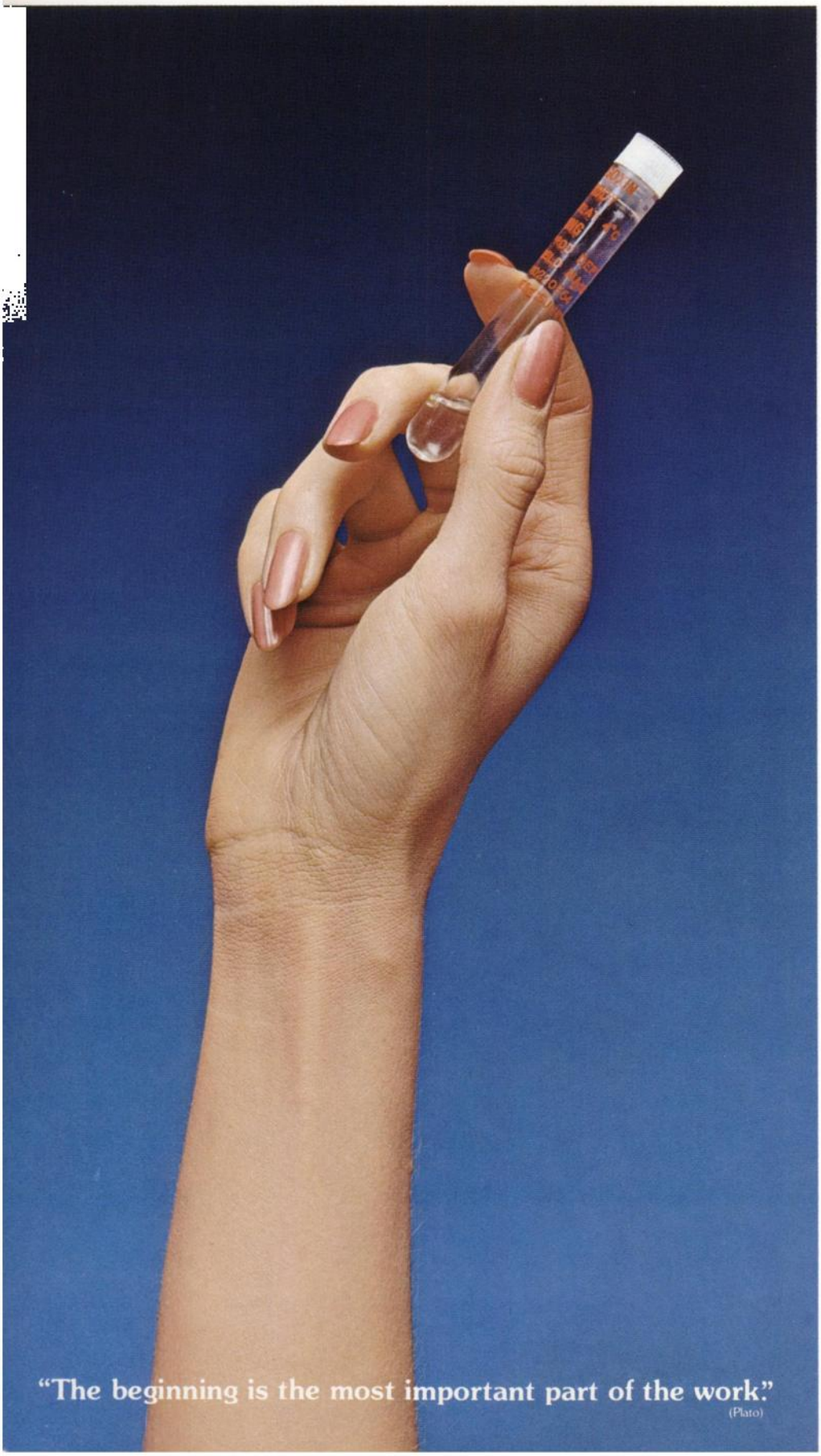
(STANNOUS PYROPHOSPHATE)

Mallinckrodt NUCLEAR

Mallinckrodt Chemical Works
675 Brown Road
Hazelwood, Missouri 63042


1974
Classic Simplicity in
RIA Digoxin from Corning

It's a snap to start!



A classic of simplicity in concept and execution. RIA without fine print. IMMO PHASE™ Digoxin from Corning.

It's done with glass.

This is the solid-phase RIA for digoxin that you start with just a snap of the cap. Yes, you *can do it* with one hand. How come? Because we've done most of the preparation for you. The key is a minute glass bead so small you could put more than two and one-half million of them on the head of a common pin!

More about the bead.
Each glass bead is both chemically and topographically suited to solid-phase RIA. Each is porous, and has an unusually high surface area. Using these characteristics, we covalently bond high-quality antibodies to the glass surface. The antibody is distributed throughout the bead in a fashion similar to water filling the pores of a sponge. What you get is an *antibody-glass* composite that is extremely stable. In fact, it's so stable that our digoxin antibody has minimum shelf life of 120 days. Additionally, the glass has a useful, high relative density. It becomes an integral separator. No additional reagents are required to effect separation of bound from free antigens.

All this makes it possible for Corning to dilute the immobilized antibody in buffer, pre-measure it into unit reaction tubes and ship to your laboratory ready to use! It's truly a snap-cap start!

Start with the ready-to-use antibody. Snap the cap. Add 0.20 ml of serum sample.

Everything is ready.
Each IMMO PHASE™ test system also includes standards, reference controls and tracer materials. Prepared standards are provided for each point on the standard curve, and reference controls have assayed values for both *normal* and *elevated* patient ranges. They are plasma-based and lyophilized for extended shelf life. You reconstitute *only once*—using distilled water. The tracer comes to you ready to use.

What it all adds up to is this: With the Corning package you have all the reagents you need to run digoxins. We even give you fold-up trays to use as work stations. Everything can be easily disposed of after you've completed your assays.

Photomicrographs of IMMO PHASE™ particle surface

"Men trust their ears less than their eyes."
(Herodotus)

Seven steps and 30 minutes later.
The procedure is simple and involves a mere *seven* steps. That's fewer than traditional RIA methods. And fewer steps mean fewer chances for error! Time required to get the results into your hands is kept to a minimum. The stat RIA digoxin is a *reality*. And, the results you get are reproducible.

Corning is ready now.
We're ready first with the results from recently completed field trials. They indicate that both within-day and day-to-day precision in terms of coefficient of variation is less than 10%. We will be glad to share details with you.

And, of course, we are ready with IMMO PHASE digoxin test systems. Both beta (^{3}H) and gamma (^{125}I) are already on the shelf. Other tests will be forthcoming. We want *you* to put *us* to the test in RIA. The coupon on the next page gives you seven options. Check all the appropriate boxes. That's the quickest route to finding out just how classically simple RIA can be.

Add 0.050 ml of tracer.

Vortex for 2-3 seconds.

Incubate for 20 minutes, at room temperature.

Centrifuge at 2500 rpm for five minutes at room temperature.

With gamma (^{125}I) digoxin, decant the supernatant to waste, and count the tube. With beta (^{3}H) digoxin, decant the supernatant into scintillation fluid and count.

Plot and calculate. A mere 30 minutes of assay time and that's it!

CORNING
Biological Products Department

™Corning Solid-Phase Separation System Materials for RIA

Corning Glass Works, Biological Products Dept. JN
Medfield, Massachusetts 02052

☐ Send me a Gamma (^{125}I) kit today and bill me*
Item #474002 (112 tubes) $140.00

☐ Send me a Beta (^{3}H) kit today and bill me.
Item #474001 (112 tubes) $115.00

30-day evaluation. I'll accept your no-risk offer to try an IMMO PHASE digoxin test system. Attached is my purchase order qualified by your 30-day evaluation offer terms. If not fully satisfied I'll return the evaluation form supplied with the kit within 30 days. If I do so I understand no invoice will be sent.

☐ For evaluation send Gamma (^{125}I).*
☐ For evaluation send Beta (^{3}H).
☐ **Consultation.** I'd like a chance to talk with a field consultant. Have one call me for an appointment.
☐ **Literature.** I need more facts. Send me detailed literature.
☐ Yes, I'd like details from your clinical field tests.

Name _____ Title _____

Affiliation _____

Address _____

City _____ State _____ Zip _____

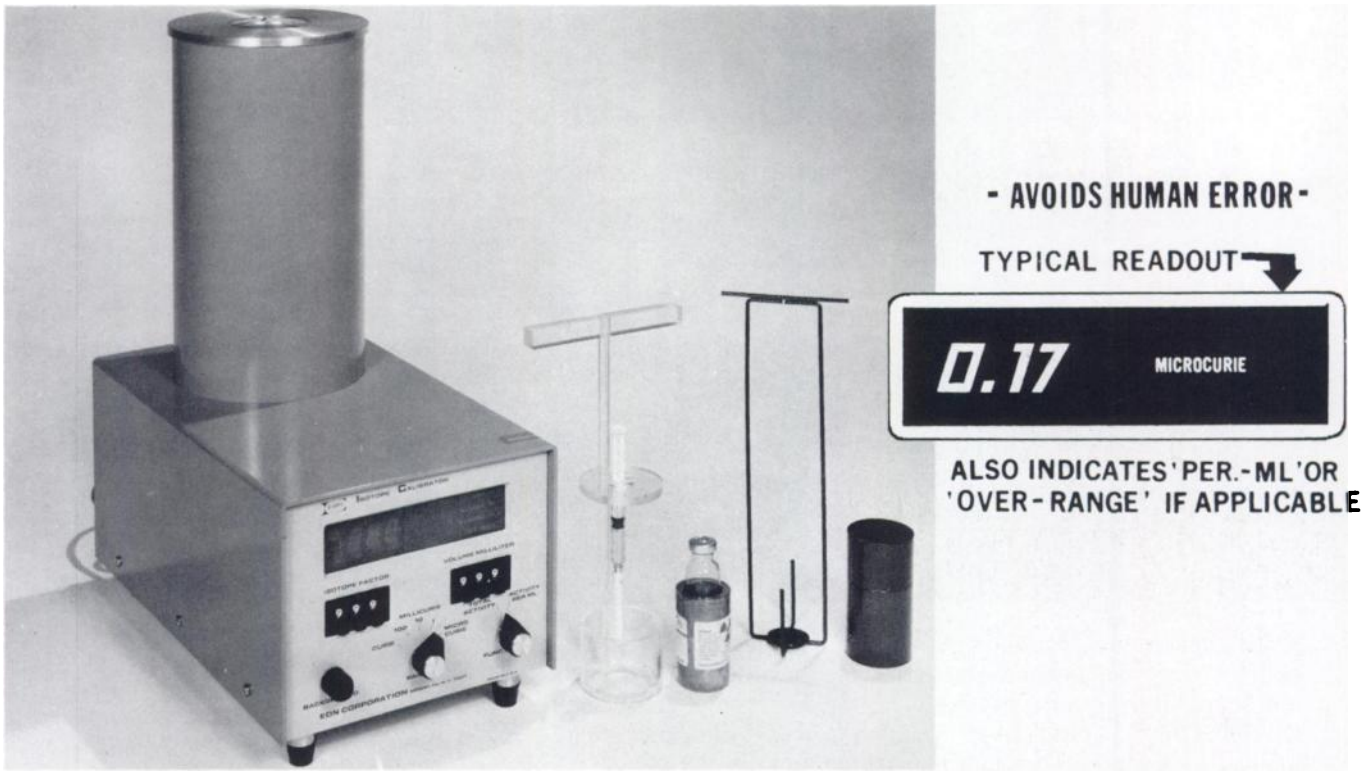
Tel. area code _____ number _____ ext. _____

*Please send us a copy of your license to receive (^{125}I) materials. Recent AEC regulation changes make it mandatory for us to have this information on file prior to shipment.

"Knowledge must come through action; you can have no test which is not fanciful, save by trial."
(Sophocles)

No matter whose radiopharmaceutical you use -- To be sure of dose accuracy you need an EON CRA-1 CALIBRATED RADIOACTIVITY ASSAYER

Measures dosages, concentrations and large volume activity for more than 40 medically approved radiopharmaceuticals.



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- ☑ Measures down to one milliliter
- ☑ Simple error-proof, push-button operation.
- ☑ Built-in background shield.
- ☑ Unsurpassed in sensitivity and accuracy.
- ☑ Completely manufactured in the U.S.A. by EON.
- ☑ Calibrations traceable to the U.S. Bureau of Standards and other nation's Atomic Energy Authorities.

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FOR TECHNICAL and PRICE INFO--WRITE: EON CORPORATION 175 PEARL ST. BROOKLYN, N.Y. 11201 (212) 858-0250 *DEALERSHIPS INVITED

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.*

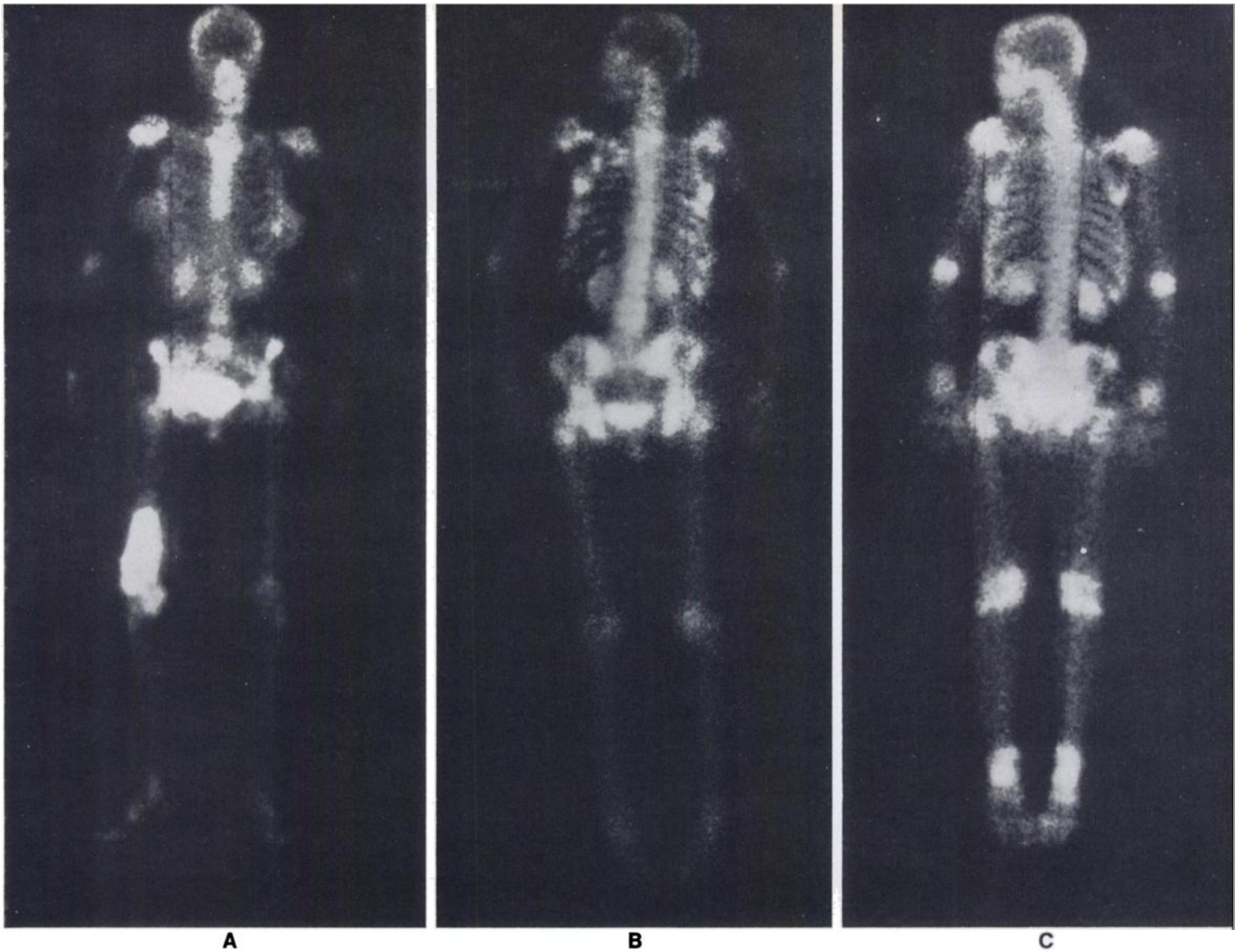
*Thin Layer Chromatography (Cellulose acetate/85% methanol)

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™)



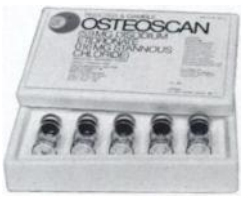
A B C

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.

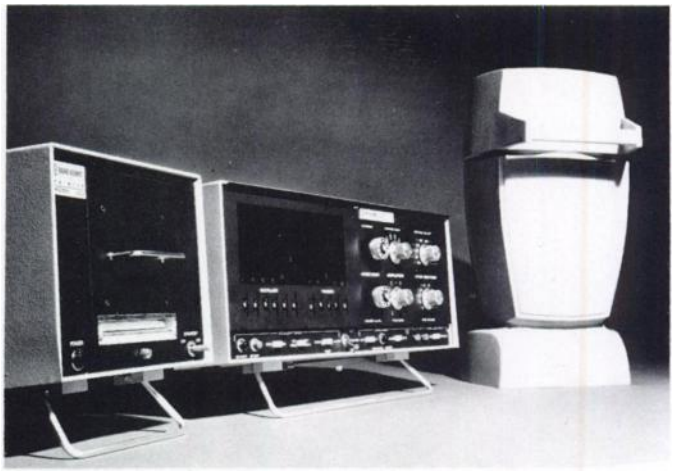
ADVERSE REACTIONS

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.



Baird's 530 the spectacular little nuclear spectrometer.

A coordinated manual system that produces like a giant. A completely reliable giant, that even provides automatic background subtract (It's also readily adaptable to an automatic system.).

The spectrometer, itself, contains all major electronic sub-assemblies, will identify all isotopes in a sample, and will determine and display the concentration of each isotope. Automatic baseline advance — all decades presetable, even an analog version — it's all there.

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125 Middlesex Turnpike, Bedford, MA 01730 (617) 276-6208.

SNM show booth #'s 166-168, 173-178.

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—Jan. 2–Mar. 28, Mar. 31–June 20, June 23–Sept. 12, Sept. 29–Dec. 19

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The NEW Oxford® SAMPLER® Model Q

Quantity control. Calibration stop halts plunger automatically for precise measurement.

Quality control: Quality performance. Forward and reverse modes permit reproducibility of even viscous fluids.

Safety tip release. Simple twist releases tip for disposal. No exposure—no fear of contamination.

Sterile tips. New individually wrapped Oxford sterile tips are available for Model Q and all other Oxford® SAMPLER® devices.

Newer tests require precision and safety. Radioisotopes, viruses, bacteria and unknowns demand safety and sterility. The new Oxford® SAMPLER® Model Q gives you the quality performance, safety and sterility necessary for hepatitis testing, bacteriology, tissue culture, radioimmunoassay. Other proven applications: Microchemistry, food assay, pharmaceuticals and environmental testing.

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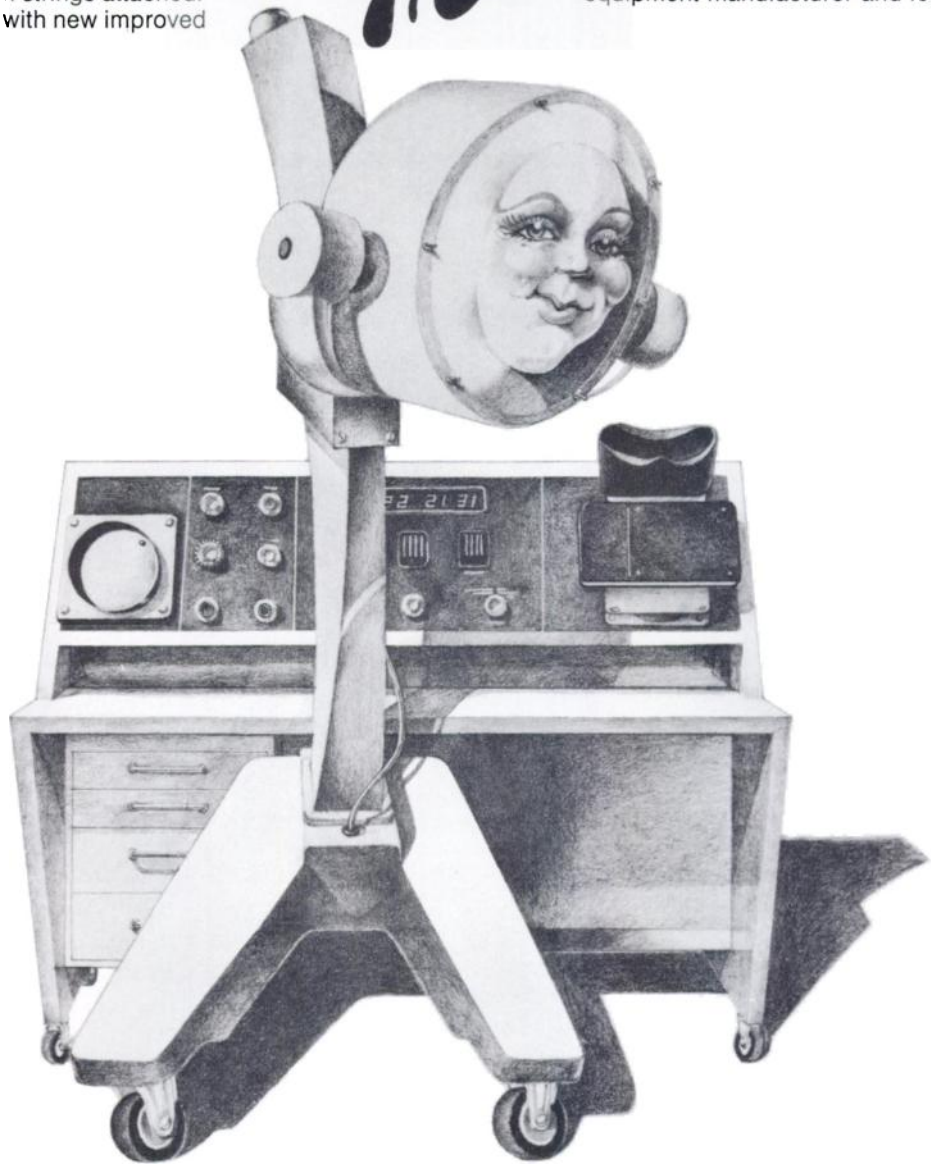
Acquire what you need when you need it, determine how long you will be compatible, and through a Lepeska Rental Plan, pay for equipment usage only. This way you can avoid the tie that binds. This way you can avoid ownership and trade for a newer model with no long term strings attached.

Especially this year, with new improved equipment systems coming on the market, you can upgrade your Nuclear Medicine Laboratory by a complete rental program. If you and that glamorous new equipment are a better match, don't worry about your old gear—it is badly needed elsewhere. If you lease from Lepeska, you can trade-in during the term of the rental. Top this one if you can. Incorporate all of your major equipment including the new system of your choice under one rental program regardless of whether you own or lease your present equipment. If a Lepeska lease already covers your equipment it's even easier. If you want new equipment now—talk to your equipment manufacturer and let's get together.



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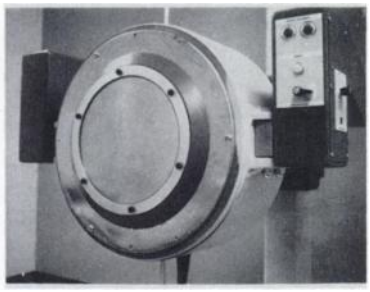
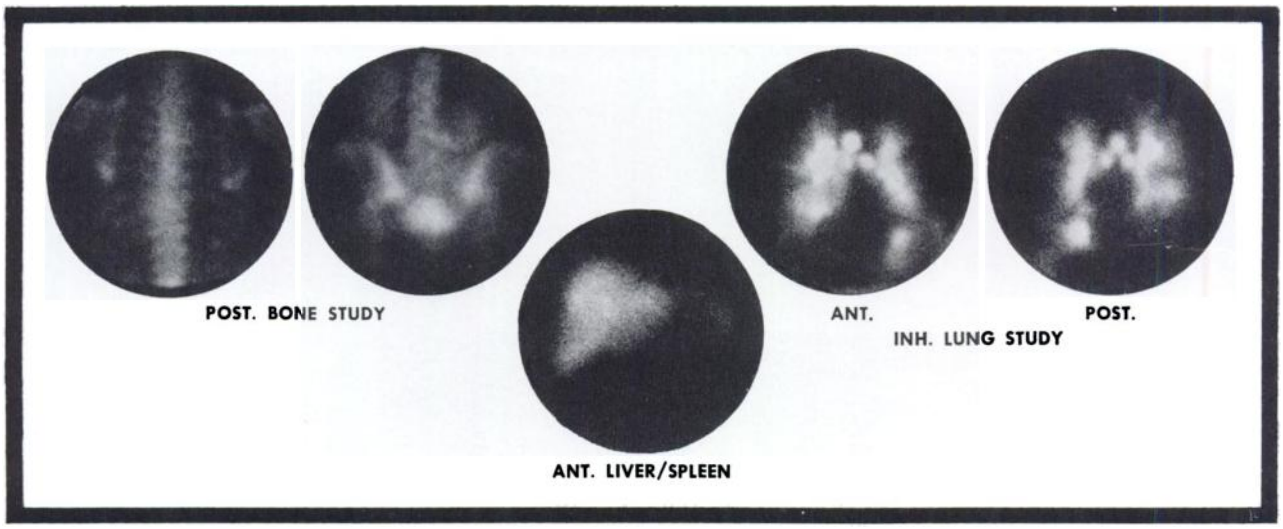
Phone toll free 800-323-7400. In Illinois, 312-381-2330.



"DI-CO"™

LOW ENERGY DIVERGING COLLIMATOR FOR THE DYNACAMERA WITH GOOD RESOLUTION, HIGH SENSITIVITY AND . . . REVERSIBLE!



Filling another need, N.I.S.E., INC. has introduced a low energy, dual purpose, diverging collimator for the Picker Dynacamera.

Its sensitivity, good resolution and wide field of view will make this collimator a valuable addition to the most needed collimators for your Dynacamera.

With six safe, but easy to remove thumb-screws (see picture above) the insert can be removed and if you prefer, reversed to a converging mode. And since we are specialists in design and manufacture of all kinds of collimators, we plan to keep the design of the outside ring, to enable you to order different inserts in the future to your or our specifications.

***SPECIFICATIONS:**

Energy Range . . . . . 43 to 210 Kev.
Holes (Hex) 5600

FIELD SIZE:

12.0"	At Collimator Face	5.08 mm (0.20")
12.9"	2" Away	8.89 mm (0.35")
13.7"	4" Away	11.43 mm (0.45")
14.6"	6" Away	15.24 mm (0.60")

MODEL NBR: MCP-7302

*We reserve the right to modify specifications and/or design without notice.

Yes, I'm interested in receiving more information on your "DI-CO". Please send me the following:

☐ PRODUCT DATA SHEET

☐ QUOTATION

☐ . . . . . .

. . . . . .

. . . . . .

Send To: . . . . . .

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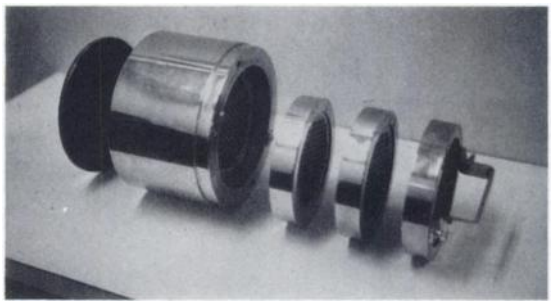
NEW...

Multi-Purpose Adjustable Collimator

IN ADDITION TO THE WIDELY APPLIED 7202 SERIES MULTI-PURPOSE ADJUSTABLE COLLIMATORS WITH ITS 5" FOCUS, N.I.S.E., INC. PROUDLY ADDS TO ITS LINE THE 7400 SERIES ADJUSTABLE COLLIMATORS.



Model: 7401
Energy Range: up to 160 Kev.
Focal Point: 4"

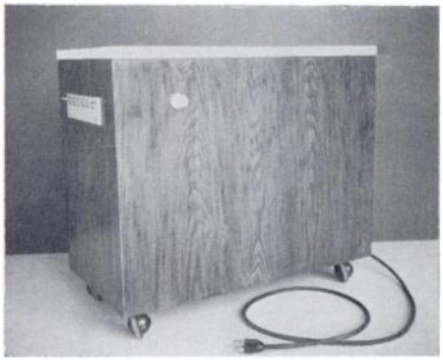
Number of Holes: 127 Holes
F.W.H.M.: 1/4" to 5/8"
Number of Adjustments: 8

Catalog Numbers for Standard Five Inch Rectilinear Scanners:

MCA-7401 ..... ABBOTT
MCB-7401 ..... BAIRD-ATOMIC
MCG-7401 ..... GENERAL ELECTRIC
MCO-7401 ..... OHIO NUCLEAR
MCP-7401 ..... PICKER NUCLEAR
MCR-7401 ..... RAYTHEON
MCN-7401 ..... SEARLE

NOTE: Also available are the regular versions of the 7202 and 7401 (Non-adjustable)

PRICES: Adjustable version (most models) $1,250.00
Non-adjustable (most models) ..... $ 750.00



THE "CHAR-COL"

- Solves serious problem of 133-Xenon disposal.
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- Each of six chambers may be used for 30 minutes of continuous collection.
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- A proven and economical way to dispense individual doses of Xenon gas from a one Curie ampoule.

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(714) 995-4872 (213) 860-6708

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Yes, N.O.W that I need you, Bill Brown, please contact me and explain all about your System 750 Multi-Format Camera RENTAL/PURCHASE PLAN.
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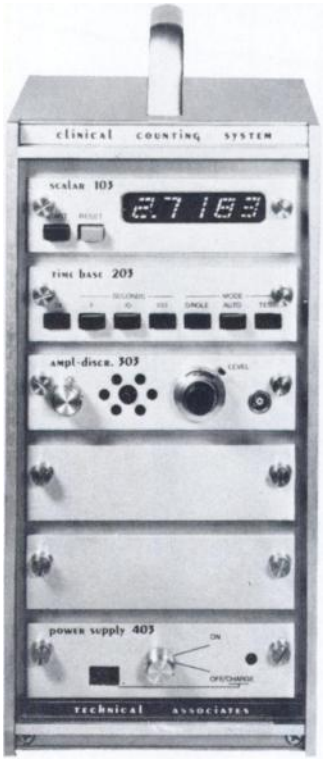

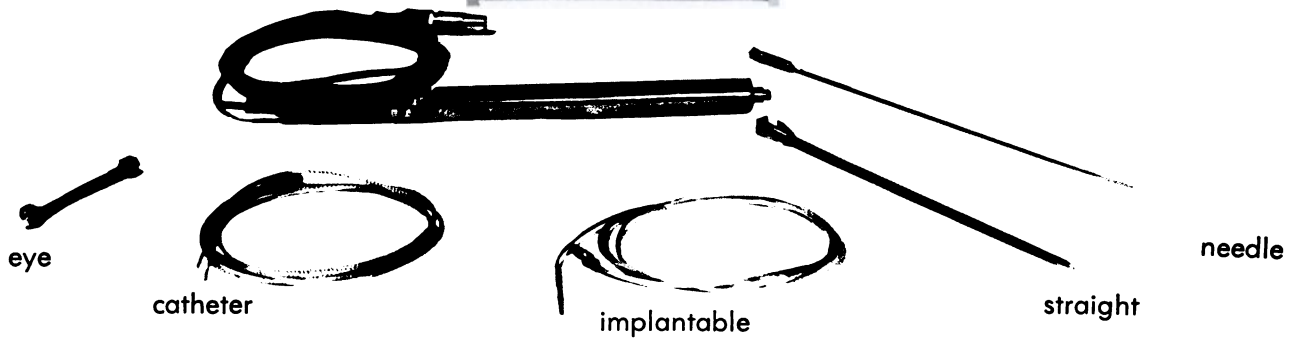

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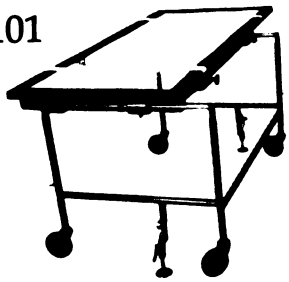
The XYZ-101 Imaging Table

• Simplicity • Versatility • Economy

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.
As a result it is surprisingly low priced at **$1,295.00**

Other tables for
Nuclear Medical Applications

XY-101



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

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EZ-101

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

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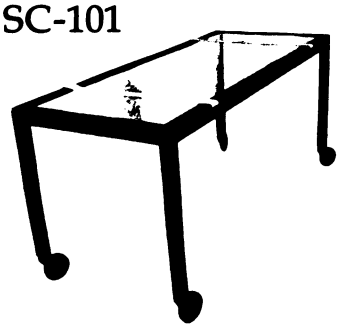

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• All prices F.O.B. Plainview, N.Y.

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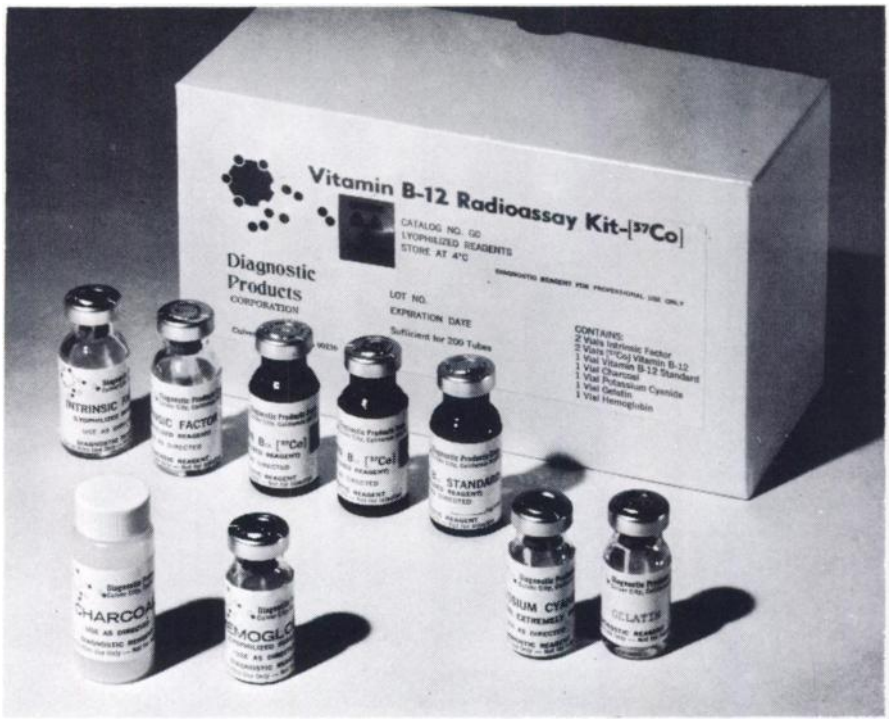

The following [^{3}H] kits are immediately available:

Aldosterone (no chromatography)

Digoxin **c AMP** **Digitoxin** **c GMP**

Because we have specialized in tritiated kits, we have developed the finest liquid scintillation cocktail available. We would like to share it with you at competitive prices. We call it **BETA-COMPLETE™**

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Programmed, Instantaneous plus daylight film processing

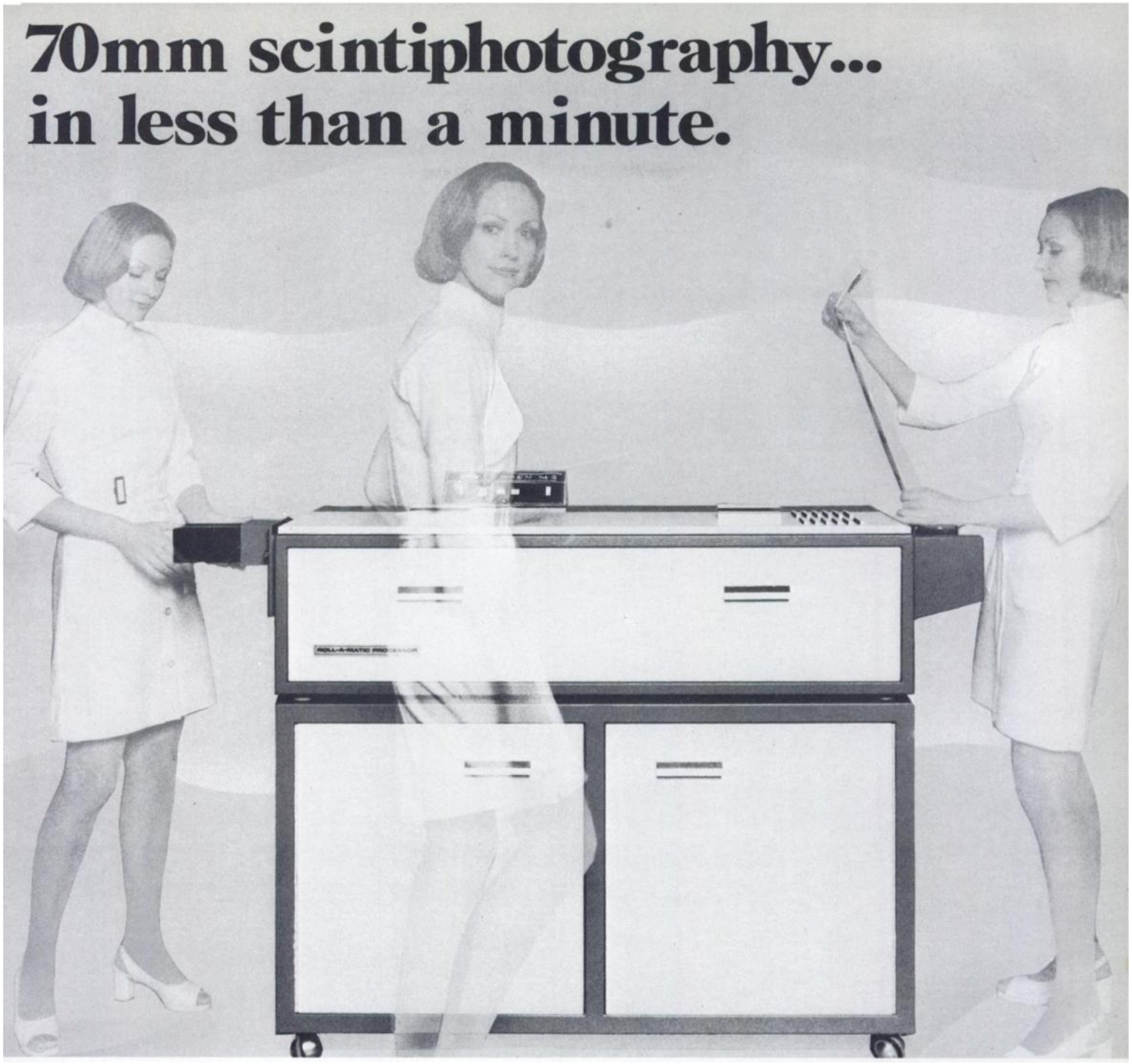
Scinti-Cam 750 70mm Camera
Programmable daylight loading camera that mounts on all existing gamma cameras and takes up to 10 exposures/second.

RADX has the system

Here's the system that meets the exacting standards of scintiphotography. Streamline your nuclear medicine department economically with the 70mm scintiphotography camera and film processor from RADX. The system that maximizes information output of your gamma camera, adds convenience and speeds patient diagnosis.

The RADX Scinti-Cam 750 programmable 70mm camera installs in minutes on the CRT of any existing gamma camera. After daylight loading of up to 174 feet of 70mm film (or an average of 730 exposures per roll), the rest is a fast, simple, pushbutton operation which carries through to even automatic film cutting. The result is your exposed film contained in a "light-tight" cassette that is ready to be processed. That's when the RADX M-3 Roll-A-Matic Processor takes over.

70mm scintiphotography... in less than a minute.



After the technician selects the processing rate and locks the Scinti-Cam film take-up cassette into place, the M-3 automatically extracts the exposed film. And in as little as 42 seconds, the processed film appears—dry and ready for viewing.

Don't delay the total coordination of your clinical procedures any longer. Call or write RADX for further information about the Scinti-Cam 750 and M-3 Roll-A-Matic system.
P.O. Box 19164, Houston, Texas 77024, 713/468-9628.

RADX CORP

M-3 Roll-A-Matic Film Processor
Daylight film loading processor, designed primarily for 35mm and 70mm roll film. Compact, totally self-contained, no external plumbing or drains required. Castor mounted console (illustrated) optional.

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.

Kit contains vial and two syringes	
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GRAPHIC™
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Please send me more information on the GRAPHIC™ Rectilinear Scanner and its applications in the ICU, Emergency Room, Isotope Laboratory and as a mobile unit.

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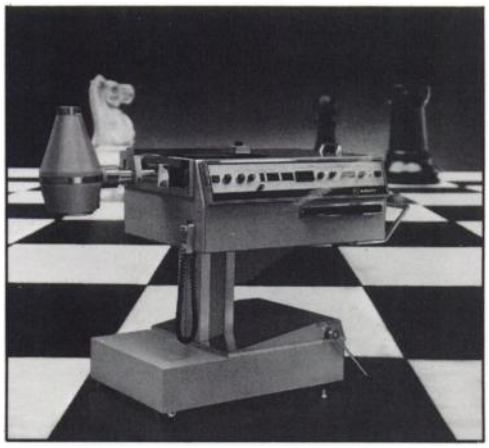
The GRAPHIC™ Rectilinear Scanner



No Extra Space Needed

Use the space you have—present facilities become nuclear scanning facilities. No need for a special diagnostic room or department. Simply move the GRAPHIC into the room where it's needed . . . GRAPHIC has room-to-room mobility. Turn a corridor into a temporary nuclear scanning lab . . . GRAPHIC will go with you, anywhere. Then push it into a nearby closet—even a corner—when you're finished.

No Need For Additional Staff

Our professional representatives will show your technician how to get high-quality scans easily with GRAPHIC. *And GRAPHIC is simple to operate* . . . little technical skill is required. A minimum of training will teach your technician to get excellent scans from your GRAPHIC time after time.

Nuclear Medicine In Your Intensive Care Unit

Bring the advantages of nuclear medicine anywhere you want: intensive care unit, operating room, emergency room . . . now the scanner will come to the patient—allowing further diagnostic aid to those not-to-be-moved patients. With GRAPHIC, you now have a choice of moves.

Move Your GRAPHIC By Van

The superior performance of a GRAPHIC scanner can go anywhere—even by van. Because GRAPHIC has:

- low physical profile
- lower center of gravity
- compact-size dimensions

GRAPHIC fits easily into *small vans*—with *no counterbalancing necessary.*

Mobility—Just One Of Many Advantages

The portable GRAPHIC Scanner has room-to-room mobility, *plus* it's

- able to give more scans per day
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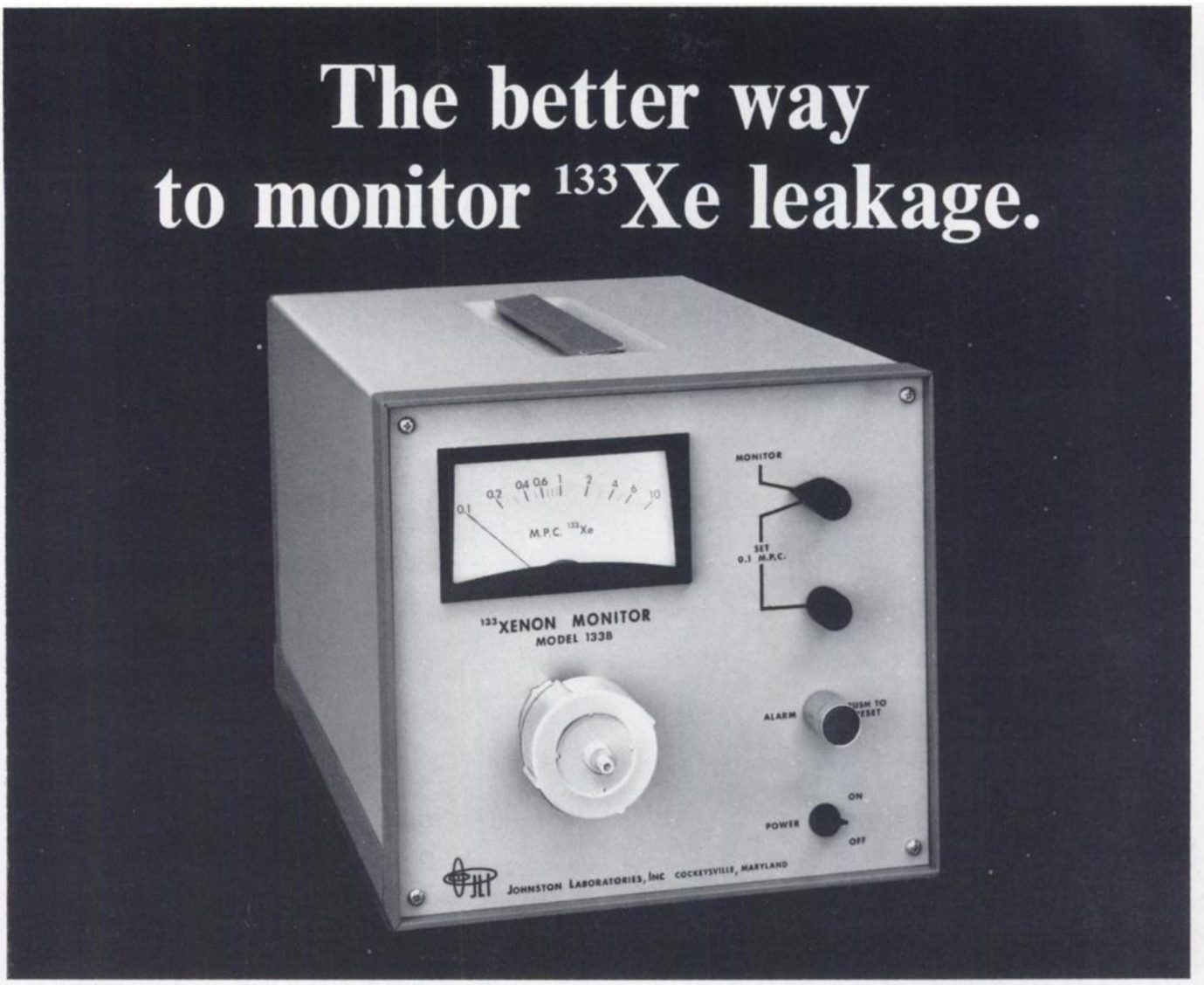
The better way to monitor ^{133}Xe leakage.



New! Low Cost ^{133}Xenon Gas Monitor

Johnston Laboratories now has available a reliable, low cost, ^{133}Xenon gas monitor. Especially designed for routine air monitoring in nuclear medicine laboratories performing Xenon studies.

Radiation hazards may result if multi-dose ^{133}Xe source containers are used or if expired air and ^{133}Xe from a patient will leak into the laboratory air.

A leakage of less than 10% of a 10 millicurie of Xenon administered to a patient in a single study can establish a hazardous concentration in the laboratory atmosphere.

The new Model 133B monitor reads 0.1 to 10 MPC of ^{133}Xe. It features a large, easy-to-read panel meter; both audible and visual alarms; and a recorder output. This new, low-cost monitor provides reliable, unattended operation. It is shielded against gamma radiation to prevent false alarms.

For price and complete specifications, write to:

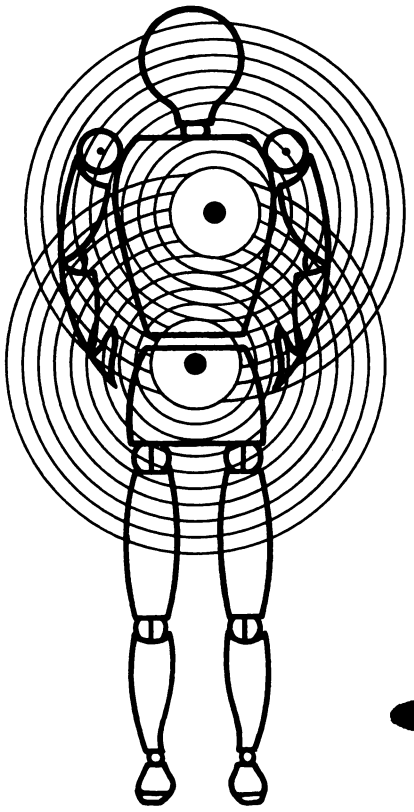
Johnston Laboratories, Inc.

3 Industry Lane, Cockeysville, Maryland 21030 USA
Phone: (301) 666-9500 Cable: "JOHNLAB"

See our products at Booth #250 at SNM Annual Meeting in San Diego.

Biokit® Aldosterone

no more hydrolysis!
no more extraction!
no more chromatography!
incubation time: only 2 hours!



Biolab introduces a new fast way to determine the aldosterone hormone. Much faster than traditional methods. Easy, suppresses all difficult manupulations. As precise as can be. A new improvement in R.I.A. technique. By Biolab.

Biokit Aldosterone, a kit of Biolab Belgium.

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THE MODUMED SYSTEM:

THE STATE OF THE ART

It seems that the best people gravitate to a special climate; or maybe they create it. When Medical Data Systems began searching for people to design and build a computer-based Nuclear Medicine information processing system, we had two criteria: experience and expertise.

The people we hired demanded only one thing from MDS: assurance that they could continue to develop their own ideas, particularly in relation to working with forward-thinking Nuclear Medicine practitioners.

We would like to tell you about the people who produce the State of the Art System. By telling you about our fundamental operating philosophy, and by recreating the special atmosphere in which the task force team works, we feel you will better appreciate the excellence of the Modumed System.

Creative environment. Self-motivated, highly responsible people. Continuing development. Art as much as Science.

The best people produce the best system. We have the best people. Have you examined our system lately?

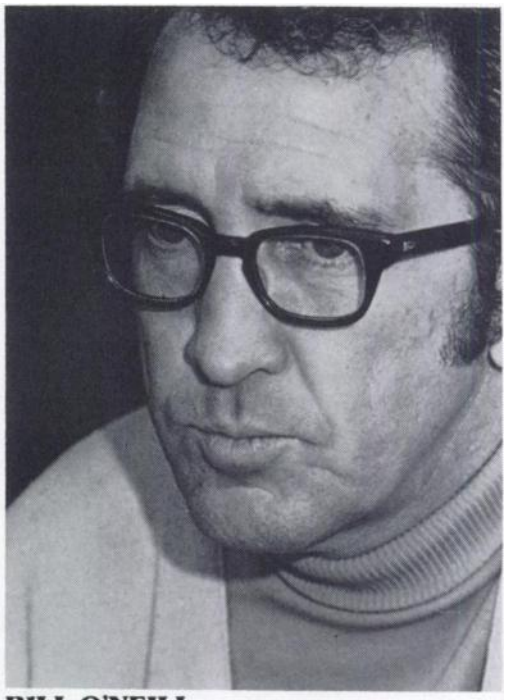
IMAGINATION, IMAGING AND THE IMPRESARIO

Bill O-Neill's constant project is enhancing static and dynamic imaging. Bill is the synthesizer of the art with the science of Nuclear Medicine information processing. He is a thinker and implementer of innovative concepts.

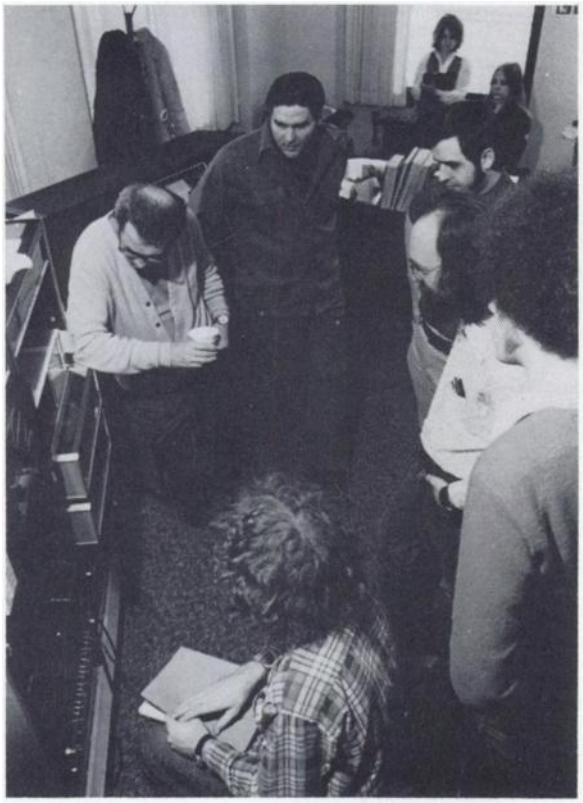
When you ask him how he feels about his work with the MDS Nuclear Medicine team, he becomes slightly embarrassed and laughs off his pride with a comment like, "I think we're like the Beatles."

But when you pursue it and ask him why he joined MDS, Bill says, "They are the only company who listens to the clients and the people. And I'm a people. And besides, they're the only company who has the guts to let me try out my own dream."

Well, why not? It was also MDS's dream to design and build the State of the Art Nuclear Medicine System.



BILL O'NEILL



SOFTWARE SOPHISTICATION

PHIL MILLER

Phil Miller thrives on your challenges. "Our Modumed System can acquire from two cameras and a scanner at the same time AND simultaneously process previously acquired data. You don't believe it? Look, I'll show you."

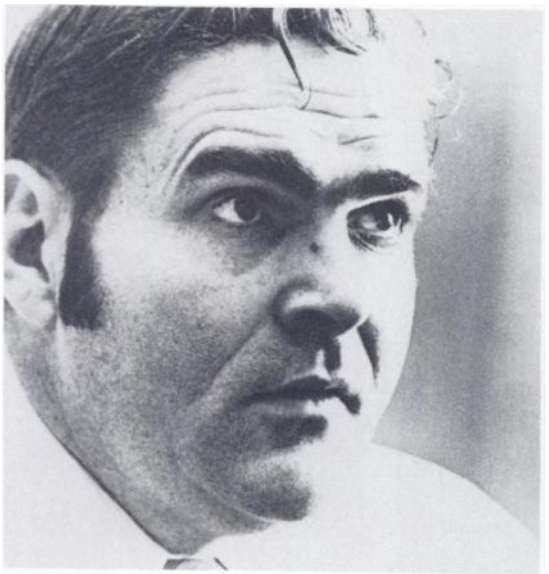
And he does. Every time. With the spontaneity and instinct of an artist and the methodology and discipline of a scientist.

But when you ask him how he develops such sophisticated concepts, he's apt to shrug his shoulders and say: "I guess computers like me."

Creative individuals like Phil and the other members of the M.D.S. Nuclear Medicine Group need maximum freedom to develop thoughts and theories in order to create functional solutions to clinical problems. Phil likes the assignments that no one else can handle and he thrives on accomplishing tasks that everyone else says can't be done.

DON STRANGE

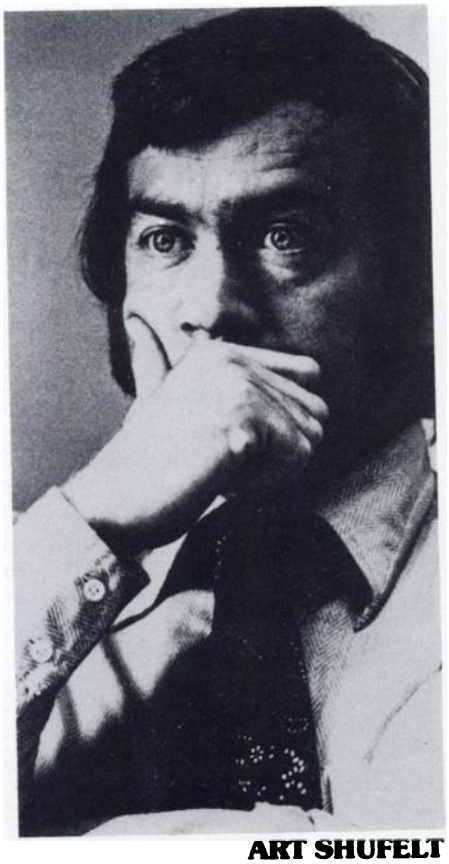
AND CLINICAL RELEVANCE



When you buy Modumed you get a little bit of all of us and a good deal of Don Strange. Because of Don's thorough knowledge of Nuclear Medicine, his chief concern is ensuring the clinical relevance of the system for each client. And because of his insistence on smooth operations he practically becomes part of your installation. When we asked Don about the company's customization policy, he chose to overlook his own personal involvement and replied, "Well, I suspect we're guilty of being too accommodating."

But the M.D.S. Nuclear Medicine Group knows that the philosophy won't change because forward-thinking Nuclear Medicine practitioners direct our progress. Don has been researching along with physicians since his graduate days and will continue to do so because he chose to work for the company that shared his vision of sharing your vision. He's a trouble-shooter. A link between what needs to be done and the means to do it.

THE ART OF MODULARITY

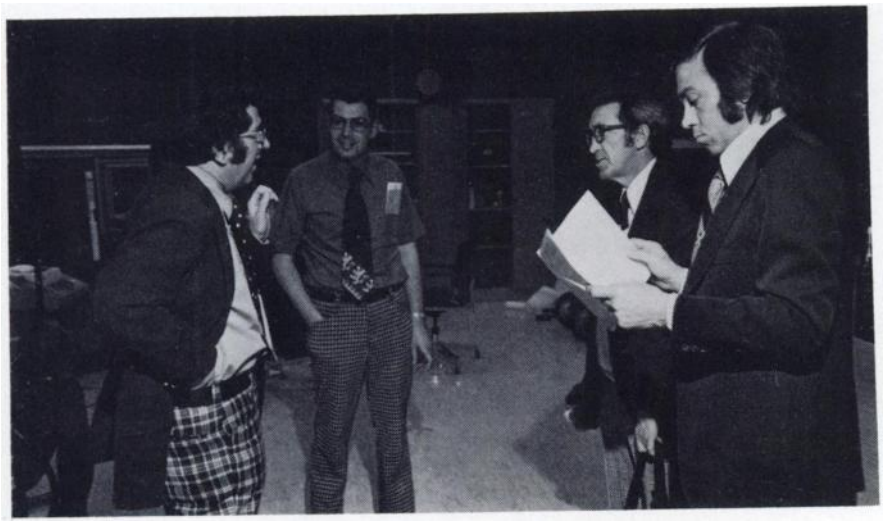


ART SHUFELT

The Group members respect each other. Rank goes according to project rather than title, so whoever has the most urgent project gets priority. But respect transcends the boundaries of office space, particularly in a person like Art Shufelt who has been with the system since its inception. Art is the Sales Manager for Modumed, and when he walks in to talk with you, he discusses Nuclear Medicine before he discusses computers. But before he does that, he listens to you.

Our philosophy and our System are modular to ensure that each client gets the type of equipment that best suits his needs. Art realizes that the State of the Art System must be adaptable and flexible enough to change and grow with you.

Why not let him listen to you?



THE STATE OF THE ART: CURRENT AND GROWING

The manufacturing group, under the direction of John Bollas, maintains the product integrity through the entire manufacturing process. They subject the system to rigorous testing before it leaves the plant to ensure that it is up and running within 24 hours after delivery.

Ken Bachman, Electrical Engineer, is primarily concerned with maintaining leadership status through hardware sophistication. As the Nuclear Medicine discipline advances with new equipment, or as technology changes, we increase our efforts by developing innovative hardware.

Everyone involved in engineering development takes pride in refining the intricate internal operation of the system. They share this philosophy with the MDS service team. Bob Guglielmo, Service Manager, requires that his engineers be equally trained in the service of Nuclear Medicine instrumentation as well as computers. The comprehensive training of the team enables them to service not only the Modumed System but also all imaging devices with which it is used.

Through the constant effort of programmers like Mike Sledz and Ross Singleton, along with the many designers, software developments come so quickly that we now post our updates monthly.

The entire company is dedicated to maintaining Modumed as the State of the Art System, so we continually update our hardware and software as part of our support effort.

Together, the Modumed Group blends their achievements to keep all dimensions of the State of the Art System current and growing.

BILL O'NEILL JOHN BOLLAS KEN BACHMAN

MIKE SLEDZ

CARROLL DE LANCEY
STEVE SCHUELER

ROSS SINGLETON

SYSTEM SYNERGISM

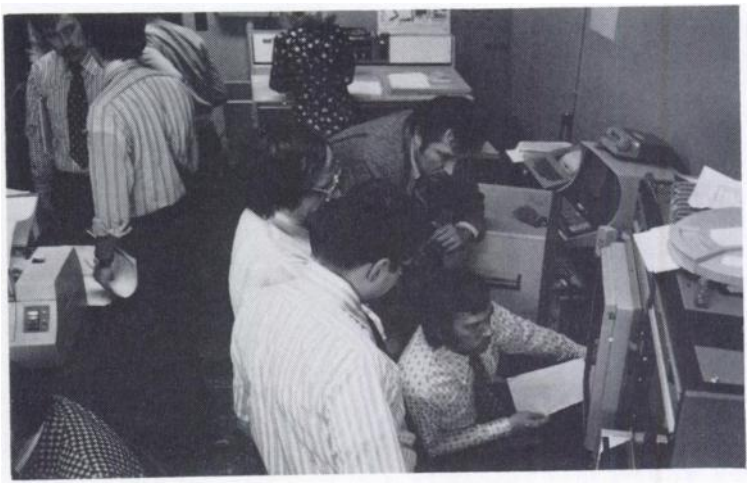
We have tried to examine how the M.D.S. Nuclear Medicine Group could advance so far in so little time. The answer, of course, lies with the individuals, but these individuals have certain things in common.

They are all perfectionists, for instance. And each person sets standards for himself that are higher than any group could set for him. They share a standard of excellence that precludes tolerance for mediocrity.

They are experts in their fields, be it designing, building, programming, selling, servicing or any variety of supporting functions. They are at MDS purely by choice.

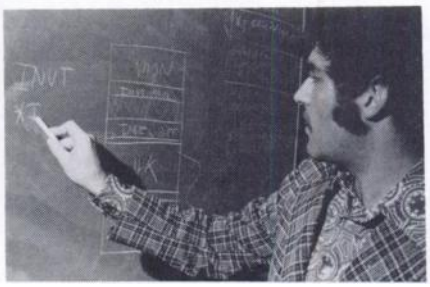
The Group shares a stretch philosophy. They are never satisfied. But after all, part of being the leader is the recognition that everything changes. The team, like the Nuclear Medicine discipline itself, advances steadily.

Everyone is working for a higher goal than just personal recognition. So they work together combining their individual expertise into group dynamics; group science; group achievement: The State of the Art.



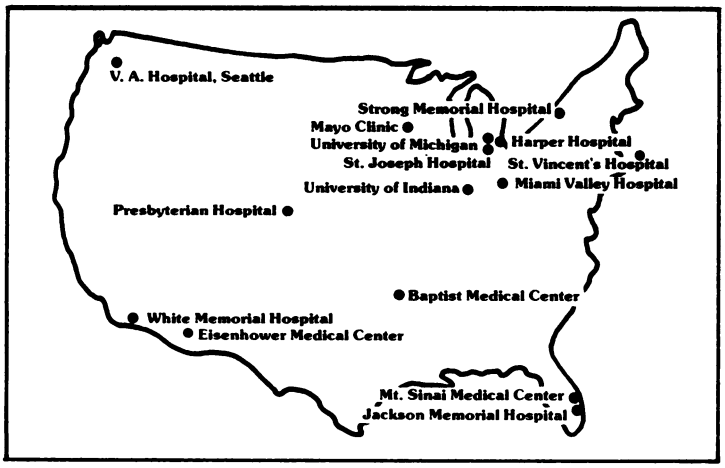
BILL MIDDLETON

BOB DAMASHEK



DAVE LIEBERMAN

WE GOT HERE BY LISTENING TO YOU



Well, you might expect us to say all these things about ourselves, but the truly satisfying thing is that our clients say them too.

Besides these installations, we have more than a dozen Modumed Systems being installed.

Our clients form the nucleus of our efforts in maintaining the State of the Art System. And they also form NUCLEUS, the group of Modumed System owners who meet with us regularly to discuss new developments and share clinical insights and ideas. They ensure that MDS will continue to support you in the most medically meaningful way in the future.

Come visit us at the convention. You can make an appointment for a private demonstration by calling any member of the Medical Data Systems Nuclear Medicine Group at (313) 872-7373.

We're still listening.

MDS medical data systems corporation
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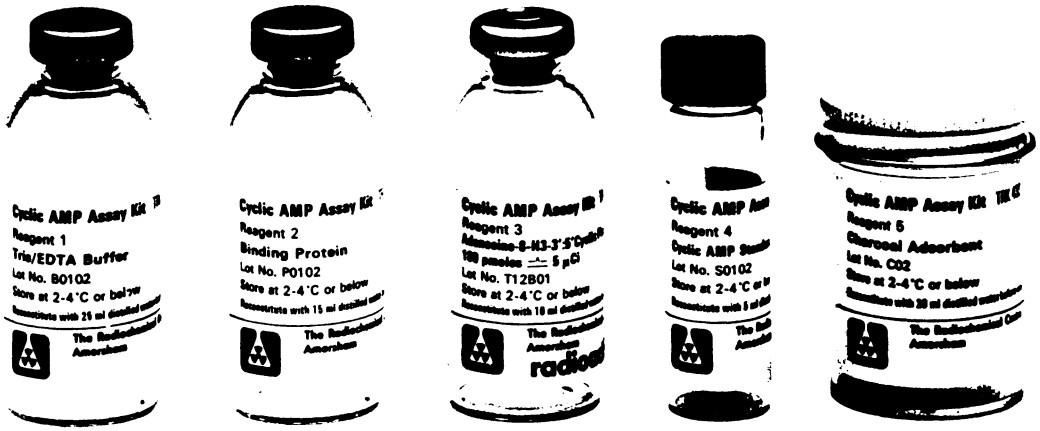
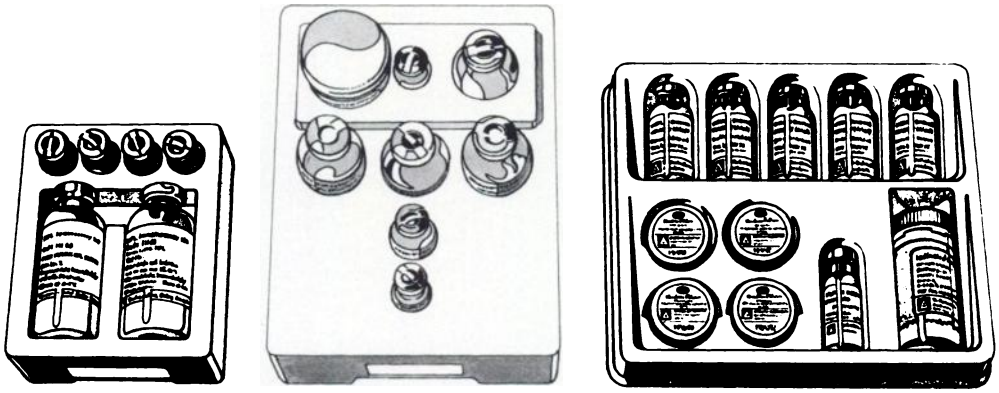
Detroit, MI. 48202
(313) 872-7373

A new Cyclic AMP Kit as reliable as our Radioimmunoassay Kits



Our latest radioassay kit—Cyclic AMP—is designed to measure cyclic AMP levels in the range 0.2-16pmol per incubation tube. Each kit contains sufficient materials for the measurement of 65 unknowns—and is as reliable as you would expect a new kit from The Radiochemical Centre to be.
Like our radioimmunoassay kits—Insulin, HPL and ACTH—Cyclic AMP can be depended upon to give consistently accurate and reproducible results.



HPL ACTH Insulin

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25 years in nuclear analysis

Over 25 years ago LKB was designing and building instruments for nuclear research. In fact, one of the earliest instruments developed for advanced work in the nuclear field was LKB's 200 million electron-volt synchrocyclotron, installed at Uppsala University in 1947.

Since that time LKB has always been in the forefront with equipment for tracing and counting radioactive isotopes in the clinical field. Some of the LKB innovations of earlier years: whole-body scanners for radioactive tracing in human patients; beta-comparators; scalers, counters and automatic sample-changers; and radio-chromatogram scanners. This wealth of nuclear experience stands behind the current range of LKB-Wallac Gamma and Liquid Scintillation Counters.

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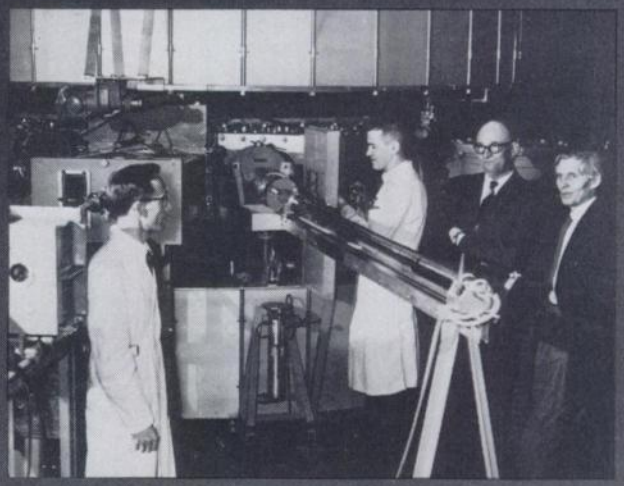

1947: LKB's 200MeV synchrocyclotron being installed at Uppsala University, Sweden.

The Only Gamma Systems With A Full 2 YEAR WARRANTY!

Nuclear Data's new MED STOR™ is a moderately priced computerized image storage and processing system that can be used with *any* scintillation camera. MED STOR provides computer controlled acquisition of static and dynamic function data, selection of up to four regions of interest, and simultaneous generation of up to four time/activity histograms. It also provides variable image framing rates, high speed list mode acquisition, file and display of patient and study data, static image display selections of 64x64, 128x128, or even 256x256 data points, and almost instant data storage and retrieval by high density magnetic computer tape. This latter capability permits playback of an image in seconds regardless of the real time required for the camera to produce the image.

Though MED STOR is a real computerized system, you don't have to be a programmer or computer expert to use it fully. MED STOR has complete built-in software and operates totally by simple understandable push-buttons. And, because MED STOR is a true computerized system, it represents only the beginning of your department's image processing and storage capability. MED STOR readily upgrades at any time to the advanced and programmable MED II image storage and processing system.

Important questions to consider before you computerize your scintillation camera.

(1) Which is the only company that actually makes its own scintillation cameras and medical computers? **(Nuclear Data)**

(2) Who is the most experienced producer of computerized image storage and processing systems in the world? **(Nuclear Data)**

(3) Which company has the most such systems in routine clinical use? **(Nuclear Data)**

(4) What one computerized image storage and processing system has done away with the typewriter keyboard and is operated totally by simple pushbuttons? **(Med Stor)**

(5) What company has the most experience in interfacing computers with cameras? **(Nuclear Data)**

(6) Which modestly-priced image storage and processing system is a real computer and not just a hard-wired multichannel analyzer? **(Med Stor)**

(7) Which company can be described in these words: "...The most sophisticated developer of software in this field and who has been doing it for a longer time than anyone else and who has more clinical software than anyone else in this field...."? **(Nuclear Data)**

(8) Which computerized image storage and processing system can actually be mastered in about two hours? **(Med Stor)**

(9) Which computerized image storage and processing system can be readily and most inexpensively upgraded to Nuclear Data's advanced MED II? **(Med Stor)**

(10) Who has an active user's group that exchanges and develops clinical software? **(Nuclear Data)**

(11) Which computerized image storage and processing system has been successfully interfaced with every major scintillation camera? **(Med Stor)**

(12) Which computerized image storage and processing system is accompanied by a Nuclear medical computer application specialist? **(Med Stor)**

These are some important reasons for computerizing your scintillation camera with MED STOR. There are more in store. To learn about them, write to the Nuclear Data office nearest you.

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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.)

In addition, since the geometric factors for AVM-3 controlled ventilation studies can be made nearly identical to perfusion studies, easy and meaningful regional V/Q comparisons are permitted.

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.

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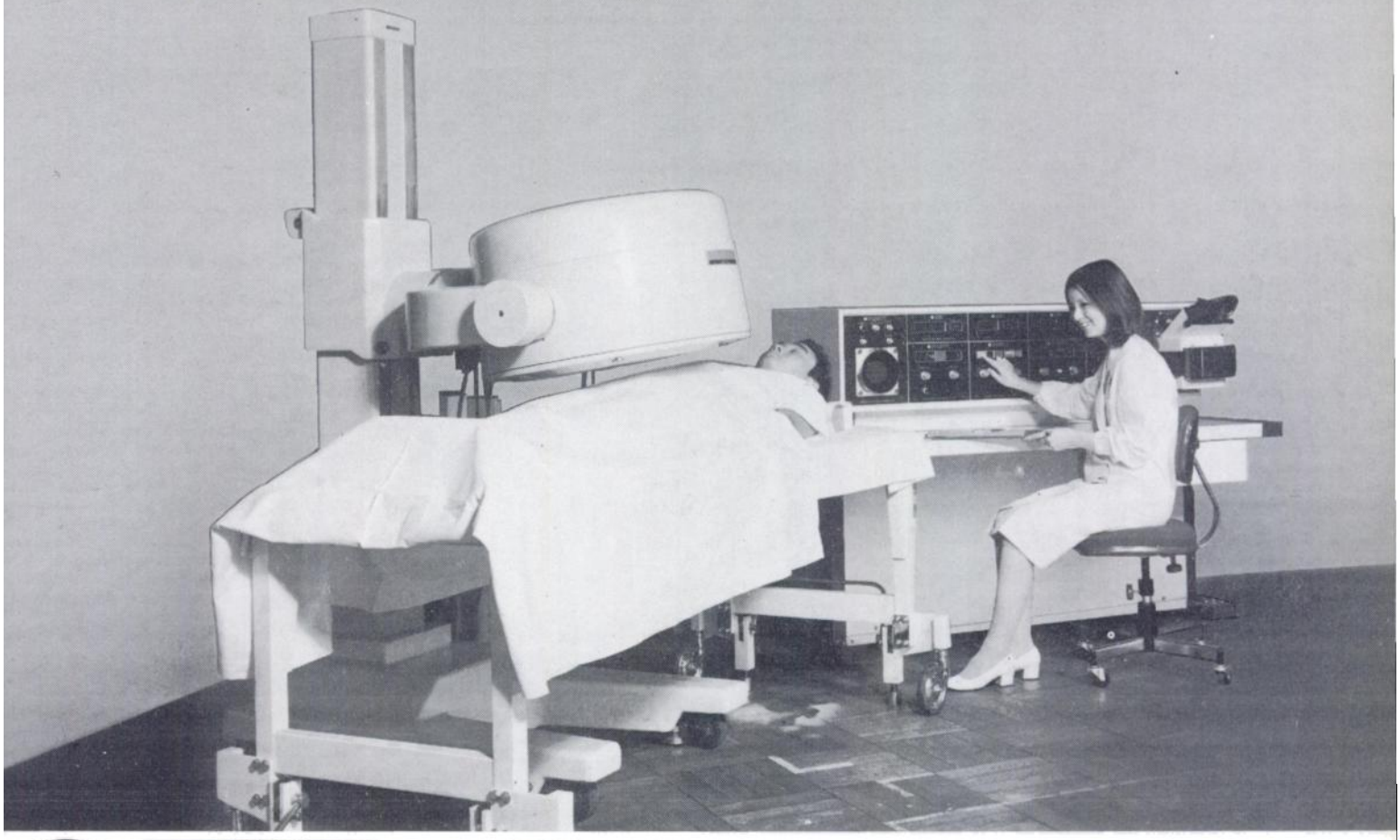
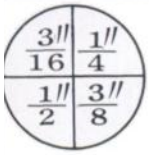
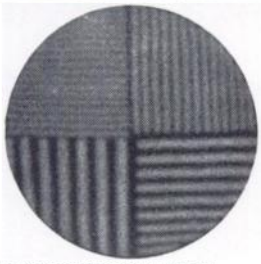
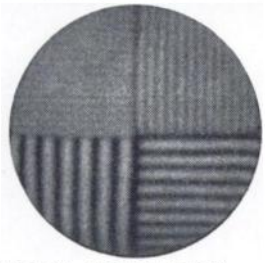
A MAJOR ADVANCE IN NUCLEAR MEDICINE BY TOSHIBA







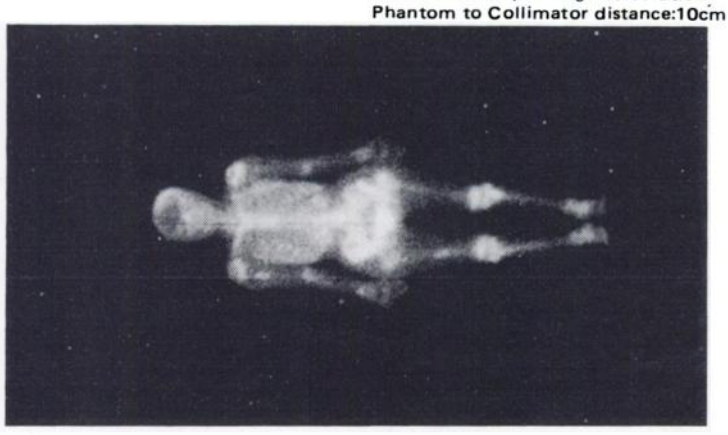
INTRINSIC RESOLUTION
^{99m}Tc, 999 K-counts, Window 20%



OVERALL RESOLUTION
^{99m}Tc, 999 K-counts, Window:20%
Collimator: Super High Resolution
Phantom to Collimator distance:10cm

Toshiba's Jumbo Gammacamera, model GCA-202, has an effective field of view 350mm in diameter. Other features include:

* The ability to image a large organ alone or in combination with smaller organs.
* No divergent collimator is needed.
* Images with high resolution and sensitivity without distortion.



The Jumbo Gammacamera and its Whole Body Adaptor make whole-body-imaging possible in only ten minutes. Other advantages:

* You get more time for other tests and diagnosis.
* More accurate diagnosis.
* Patients don't have to go through time-consuming examinations.

SORRY U.S.A.—*GCA-202 is not available in your country.*

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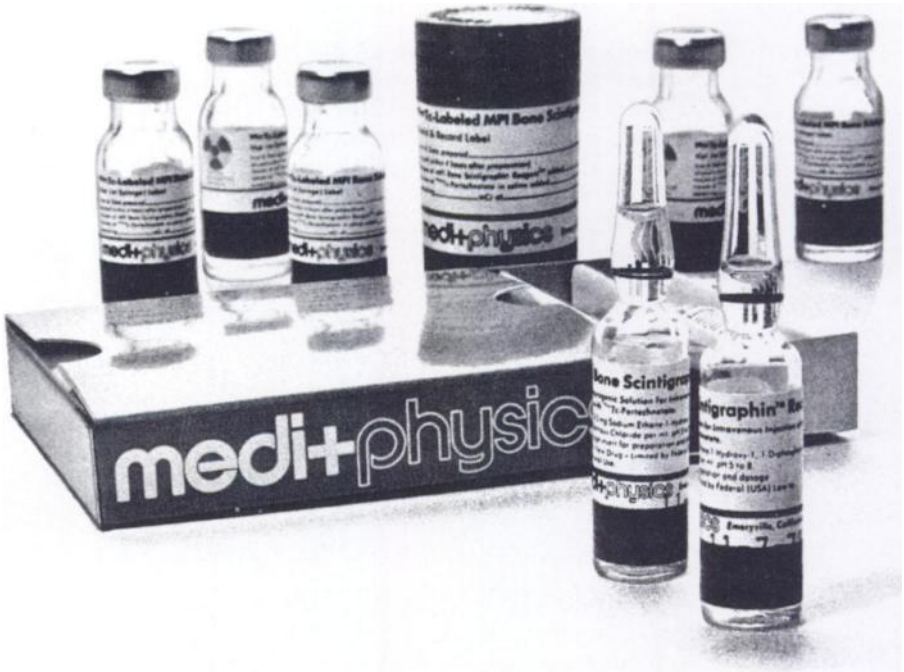
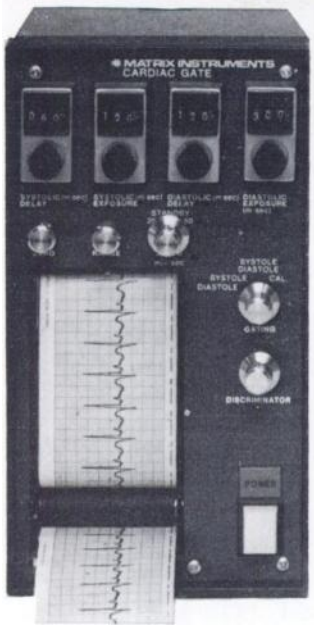


New drug — Limited by Federal (USA) Law to investigational use. For information contact Medi+Physics at / West Coast: Main office, 5855 Christie Avenue, Emeryville, California, toll free (800) 227-0483 or in California (800) 772-2446. Los Angeles, (213) 245-5751 / Midwest: Chicago (312) 671-5444 / East Coast: South Plainfield, New Jersey (201) 757-0500 / Canada: Ottawa, Ontario (613) 225-2444. Vancouver, British Columbia (604) 980-9412.

Cardiac and respiratory gating for gamma cameras and ultrasound scanners.

Cardiac Gate

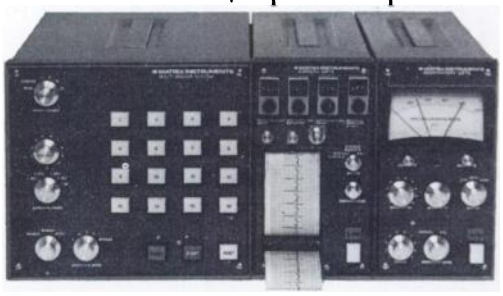


Respiratory Gate

The only system that can record both end-systole and end-diastole simultaneously. The Cardiac Gate allows cardiac blood pool imaging at end-systole and end-diastole. It is a complete ECG instrument, including a heated stylus strip chart recorder that records both the patient's cardiogram and the exposure gates. Independent delay and gate duration controls, calibrated in milliseconds, for both systolic and diastolic images allow optimum synchronization with each individual patient's cardiac cycle.

The Respiratory Gate is designed to minimize respiration motion artifacts in gamma and ultrasound imaging, particularly in liver and lung studies. When used with a gamma camera, the system operates without attaching any sensors to the patient. Unique circuitry allows direct sensing of organ motion by using the split crystal mode or areas of interest of the gamma camera. Thus, the motion of the organ itself is sensed, rather than indirectly through monitoring of respiration.

The Cardiac Gate and the Respiratory Gate can be combined to provide both cardiac and respiratory gating. When used with our Multi-Imager System all selectable states of the cardiac and respiratory cycles can be recorded simultaneously using multiple frame formats. Thus, both end-systolic and end-diastolic images, and both inspiration plateau and expiration plateau images can be recorded simultaneously using a two frame format. If both cardiac gating and respiratory gating is selected, a four frame format simultaneously records 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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POST-OPERATIVE DEEP VEIN THROMBOSIS:

"The best diagnostic tool at present..."*

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

Fibrinogen is the simplest of all current diagnostic methods; unlike phlebography, which requires complex, expensive equipment and movement of the patient, the fibrinogen technique is economically and practically viable in any hospital, from the large metropolitan establishment to the small cottage unit.

Fibrinogen is not only simple both to apply and interpret – it can be readily used to screen large numbers of patients at risk, and involves minimum discomfort for patients during their immediate, and often difficult, post-operative period. The need for rapid, reliable diagnosis is crucial if the sequelae of deep vein thrombosis are to be avoided.

'There can now be no doubt about the importance of deep vein thrombosis and its sequelae'* And there can now be no doubt about the importance of fibrinogen in the control of this potentially fatal condition.

Iodinated (^{125}I) Human Fibrinogen Injection (IM.53P) for the early detection of post-operative deep vein thrombosis

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Not available in the USA or Canada.

2659/SEP 73

POSITIONS OPEN

NUCLEAR MEDICINE TECHNOLOgist. Expanding Dept. seeks certified or eligible tech. Duties will include imaging, both static and dynamic, as well as in vitro procedures including RIA. Prefer exposure to RIA procedures but willing to train in this area. Please send detailed resume and salary requirements to: Personnel Manager, Eskaton American River Healthcare Center, 4747 Engle Road, Carmichael, Calif. 95608.

EXPERIENCED RADIOIMMUNOASSAY Chemist. Western region's most progressive Health Science Center offers you an exceptional opportunity to expand your employment horizons with a change of pace and limitless intellectual stimulation in a university setting. Requires experience in Nuclear Medicine in vitro procedures with emphasis on developing and maintaining radioimmunoassay program. Potential to assume supervisory responsibilities in a referral lab situation. Up-to-date equipment. Year round, four-season resort atmosphere with unlimited outdoor recreational opportunities. Salary negotiable. Send complete resume to Harold J. DeBlanc, Jr., M.D., Director, Division of Nuclear Medicine, University of Utah Medical Center, Salt Lake City, Utah 84132. An equal opportunity employer.

NUCLEAR MEDICINE TECHNOLOgist, registered or eligible. Maricopa County General Hospital, 500-bed teaching institution. Research and advanced clinical procedures. Full range of equipment and agents. Highly qualified staff, bio-medical engineer, immunologist, and physicist. Excellent fringe benefits including three weeks vacation, sick leave, and retirement plan. Please submit resume to Health Services Employment Office, 906 North 24th Street, Phoenix, Arizona 85008.

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RADIOPHARMACIST, M.Sc. IN RADIOpharmacy, experienced in radiopharmaceutical preparation, CPBs, RIAs, quality control, R & D, desires position in progressive nuclear medicine. Available July, 1974. John R. Scott, 316 - 6716 Silver Avenue, Burnaby, B.C., Canada.

RT(ARRT), B.A. SEEKING A POSItion as technical administrator or business coordinator for a large group practice or university hospital heavily involved in Nuclear Medicine. Over ten years of combined experience in nuclear medical technology, instrumentation and development, biochemical R & D, and management. Please send reply to Box 601, S.N.M., 305 E. 45th St., New York, N.Y. 10017.

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For information: GERALD L. DeNARDO, M.D.
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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.**

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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.

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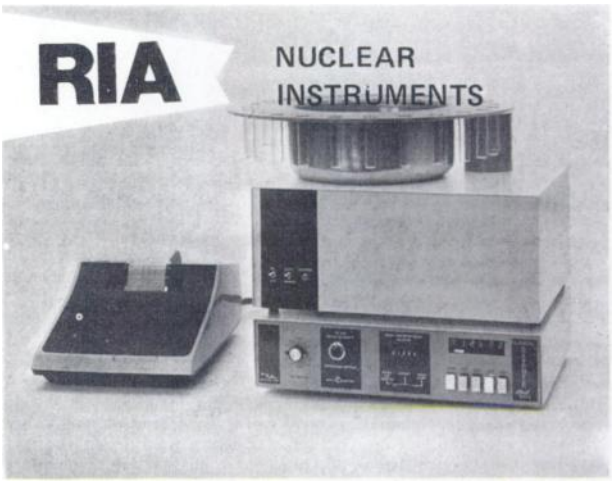

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NORTHERN AND SOUTHERN CALIFORNIA CHAPTERS THE SOCIETY OF NUCLEAR MEDICINE 6th Annual Meeting

Downtown Hilton Hotel
San Francisco, California

October 25–26, 1974

ANNOUNCEMENT AND CALL FOR ABSTRACTS

Original Nuclear Medicine contributions are welcomed by the Scientific Program Committee. The subject is open to the disciplines of Nuclear Medicine and allied physical and biological sciences. The sessions are primarily scientific and will include several workshop sessions.

The abstract should include:

1. Statements of purpose, techniques, results with supporting data and conclusions;
2. 250 words maximum;
3. The title and authors should be stated exactly as you wish them to appear on the program. Presenting author's name should be underlined.

Send abstracts on standard nuclear abstract form to:

DR. THOMAS BUDINGER
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Standard nuclear abstract forms may be obtained by writing to Dr. Budinger at the above address.

Deadline: August 19, 1974

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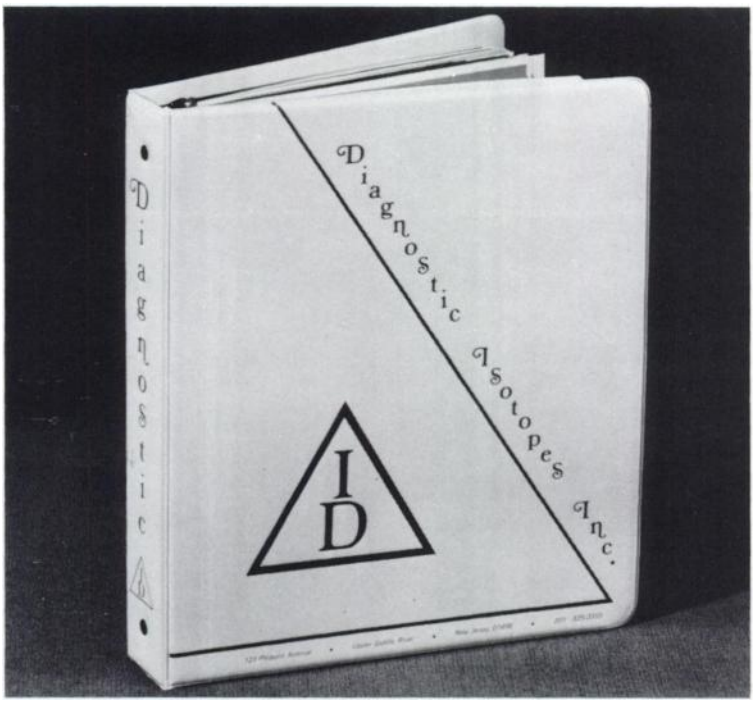

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After a very successful second year the Nuclear Medicine Institute is presenting a third four-week comprehensive course for physicians in nuclear medicine. This program is geared to the physician interested in continuing education in nuclear medicine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

Physics
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Interpretative sessions

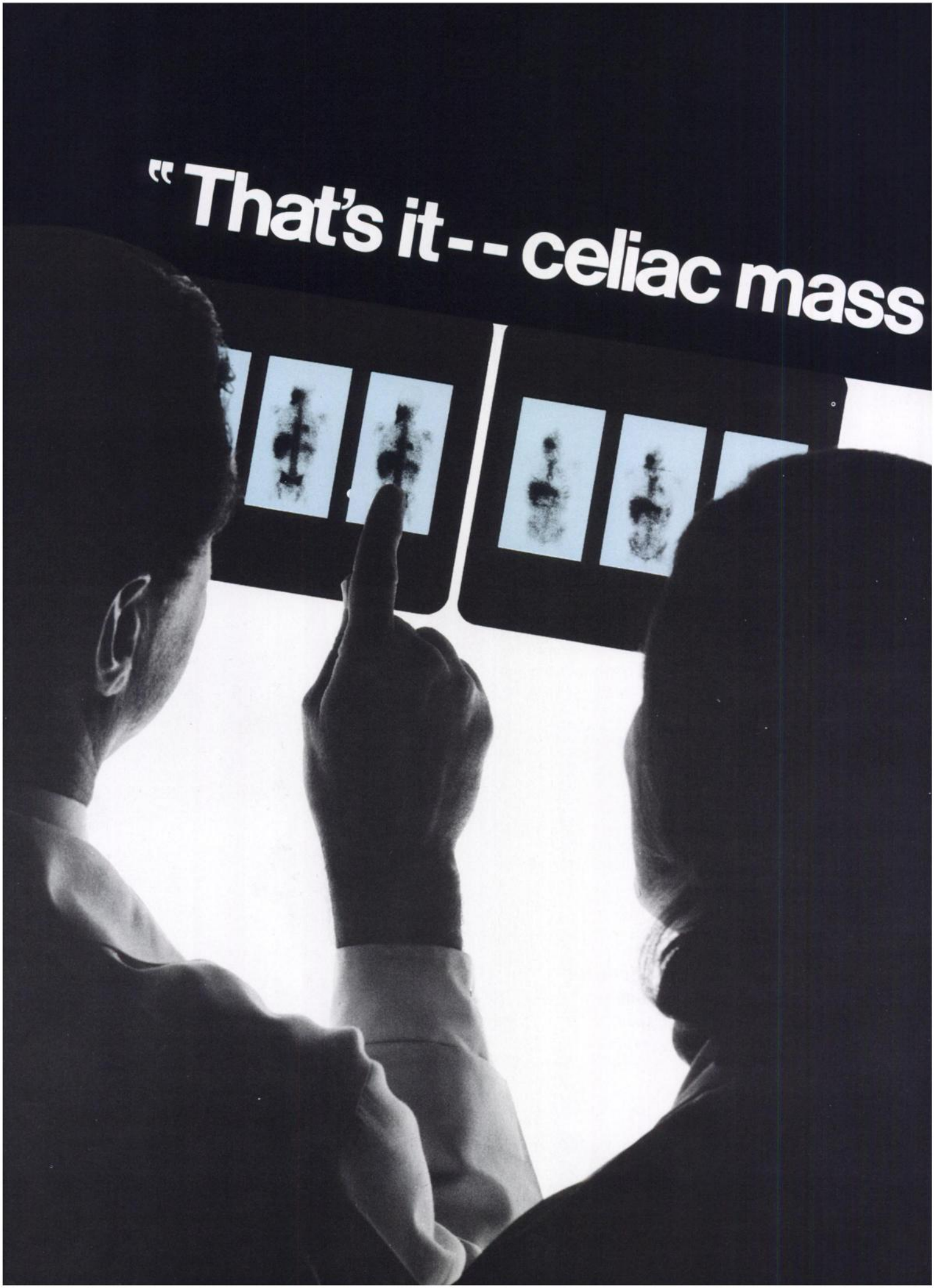
A unique interrupted schedule format has been chosen so that maximum duration away from home will be five days at a time. Classes will be held the weeks of:

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:

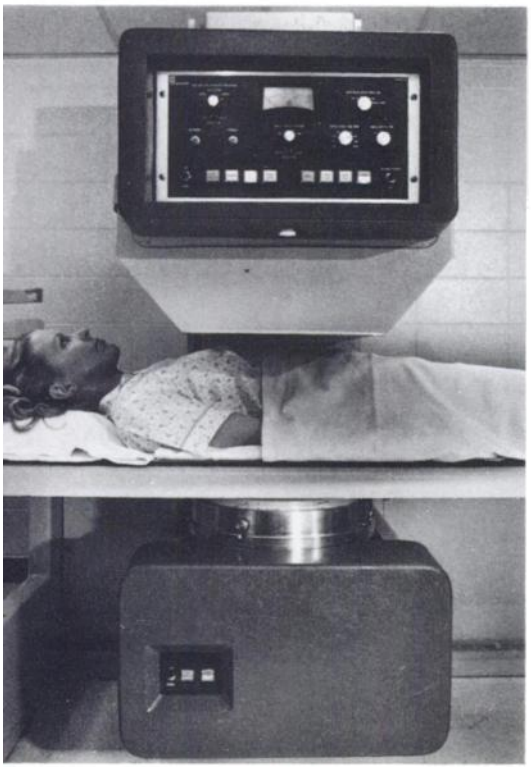
D. BRUCE SODEE, M.D., *Director*
Nuclear Medicine Institute
6760 Mayfield Road
Cleveland, Ohio 44124


"That's it--celiac mass

when diagnosis
is in doubt,
PHO/CON
HELPS CONFIRM

confirmed by PHO/CON.™"

(... the tomo scan also shows a left supraclavicular lesion which was not observed with conventional scanning techniques.)



PHO/CON — the new simultaneous multiplane imaging device — gives your facility unique diagnostic advantages. It can confirm tentative diagnoses suggested by other imaging methods, and can often provide definitive visualizations when other methods cannot.

A significant advantage of the PHO/CON is that it gives you up to six anterior and six posterior tomographic images from one scan, each readout being sharply focused on a different plane in the subject. Thus, lesions which are often obscured in conventional imaging techniques can be dramatically enhanced with near constant resolution regardless of depth.

And unlike other modalities, PHO/CON is not limited to single organ imaging. It has a large 26″ x 70″ scan field, so that whole body skeletal and organ imaging can be performed when necessary. Each detector head produces six simultaneous 2″ x 2″ tomographic images on a 5″ x 7″ film, or three simultaneous 2″ x 5½″ whole body images on an 8″ x 10″ film. Minification is 5:1 to 9:1 depending on the scan area you select, 13:1 for large area and whole body.

Collimator change is quick and easy, with no heavy lifting required. Detector heads are automatically positioned to Lazy Susans for change and storage. Available are High Resolution (6 mm) low energy, Intermediate Resolution (10 mm) low energy, and Intermediate Resolution (10 mm) medium energy collimators.

As for efficiency and speed of procedure: PHO/CON has 3 times the crystal area of a dual 5″ scanner, with scanning speed up to 1000 cm/min.

And the PHO/CON will not be easily obsolesced. Its operating range of 70 KEV to 511 KEV can handle any current or foreseeable isotopes.

PHO/CON is ready to prove its diagnostic value in teaching hospitals and cancer clinics worldwide. For complete information on its use in your own facility, write or phone:

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FOR LUNG IMAGING
(15-30 MICRON)
3M BRAND
ALBUMIN MICROSPHERE 99mTc LABELING KIT

FOR CONSISTENT LUNG IMAGES day after day after day!

USE ^{99m}Tc ALBUMIN MICROSPHERES

• **Uniform Shape and Size**
Perfectly spherical, the 3M Albumin Microspheres are uniformly sized to 15-30 microns in diameter. This uniformity, coupled with an extremely low tendency to agglomerate, results in truer images of lung perfusion. The result — no hot spots or extra-lung activity.

• **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.

3M COMPANY

The safe use of up to 30 miC of XENON-133 in pulmonary function studies is well-established*

Cutaway view of shipping container showing how the glass ampule of Xenon-133 is shielded by lead and insulation to assure safe handling without radiation hazard.

IF YOU DO TEN OR MORE LUNG STUDIES PER MONTH USING XENON-133, CONSIDER THE CONVENIENCE AND ECONOMY OF PURCHASING CURIE QUANTITIES OF THE RADIOISOTOPE FOR USE IN A TRANSFER VESSEL

- No minimum annual Xenon usage required.
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*"HANDLING, USES, AND RADIATION DOSIMETRY OF XENON-133" by Merle K. Loken, M.D., Ph.D., and George S. Kush, M.S. Reprint from Atomic Energy Commission Symposium Series #20 on Medical Radionuclides: Radiation Dose and Effects. For free copy, send coupon.

Please send more information on the XENON TRANSFER VESSEL and the purchase of XENON-133 in Curie quantities:

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Minneapolis, Minn. 55420
Telephone: (612) 881-1171

The XENON Transfer Vessel

keeps radioisotope XENON-133 dissolved in saline safely and economically for convenient in-lab use.

The Xenon Transfer Vessel has been in clinical use for five years. Patent No. 3,742,988 was issued July 3, 1973.

SAFETY A Curie of Xenon-133 in the Xenon Transfer Vessel assures negligible radiation hazard to personnel and provides a safe, convenient means for storage. Less than 2 mR/hr exposure at six inches from the vessel. Personnel involved in transfer and administration of Xenon receive low exposure, less than 0.1 of maximum permissible dose.*

CONVENIENCE Laboratory conversion of Xenon-133 into saline is accomplished in a few simple operational steps, releasing a Curie (or more) of Xenon-133 from a specially-designed-and-sealed glass ampule into saline solution. Dosages are easily drawn off through a 0.45 μ Millipore filter. Xenon-133 is also easily converted from saline to syringe air. Problems of patient scheduling to coincide with unit dose deliveries are eliminated.

ECONOMY The transfer vessel method results in a substantially reduced isotope cost. There is no lease obligation, no capital investment, no minimum annual usage required, no maintenance concern. The vessel is replaced every ten months (sooner if needed) at no expense to the user. Vessel fee is charged only in months when Xenon is ordered.

CONCENTRATION Initially, approx. 20 miC of Xenon-133 per cc of saline. Greater concentrations possible using a multiple Curie ampule. Concentration in the 50 cc chamber decreases with use and decay.

Send coupon on facing page for more information and literature on the Xenon Transfer Vessel.

*"HANDLING, USES, AND RADIATION DOSIMETRY OF XENON-133" by Merle K. Loken, M.D., Ph.D., and George S. Kush, M.S. Reprint from Atomic Energy Commission Symposium Series #20 on Medical Radionuclides: Radiation Dose and Effects. For free copy, send coupon on facing page.

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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

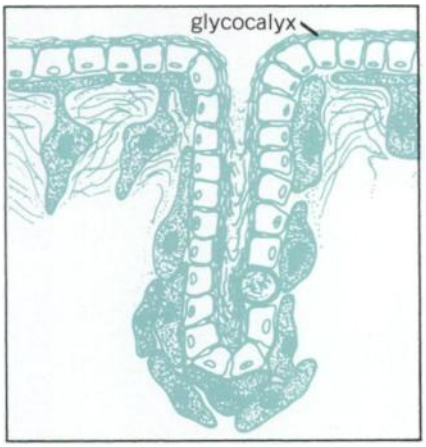
the discovery of carcinoembryonic antigen

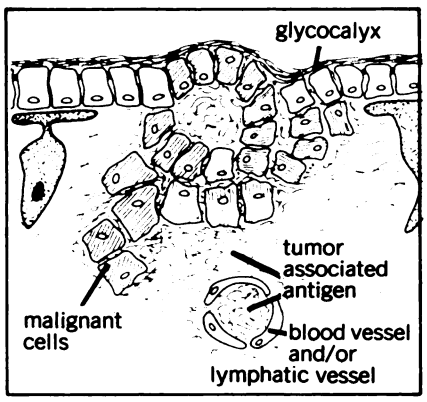
The term carcinoembryonic antigen (CEA) was first used in 1965 by Gold and Freedman of the Montreal General Hospital to describe a glycoprotein which is a constituent of the glycocalyx of embryonic entodermal epithelium; it is also present in extracts of carcinoma cells.[3-6]

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]

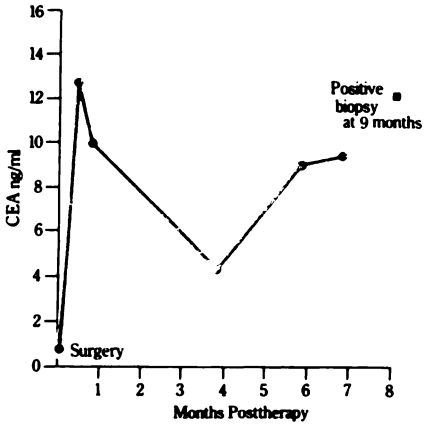
In a special study of 883 patients, cigarette smoking with titer elevations were associated with atypical sputum cytology.[23] Decreases in CEA titer often occurred within 30 to 60 days after cessation of smoking.

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

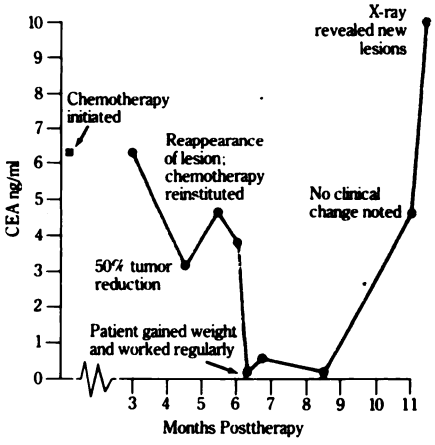
CEA-ROCHE is not recommended as a screen to detect cancer. CEA titers are not an absolute test for malignancy, nor for a specific type of malignancy. In the management and diagnosis of the patient suspected or known to have cancer, all other tests and procedures must continue to be given emphasis. CEA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

K-6

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

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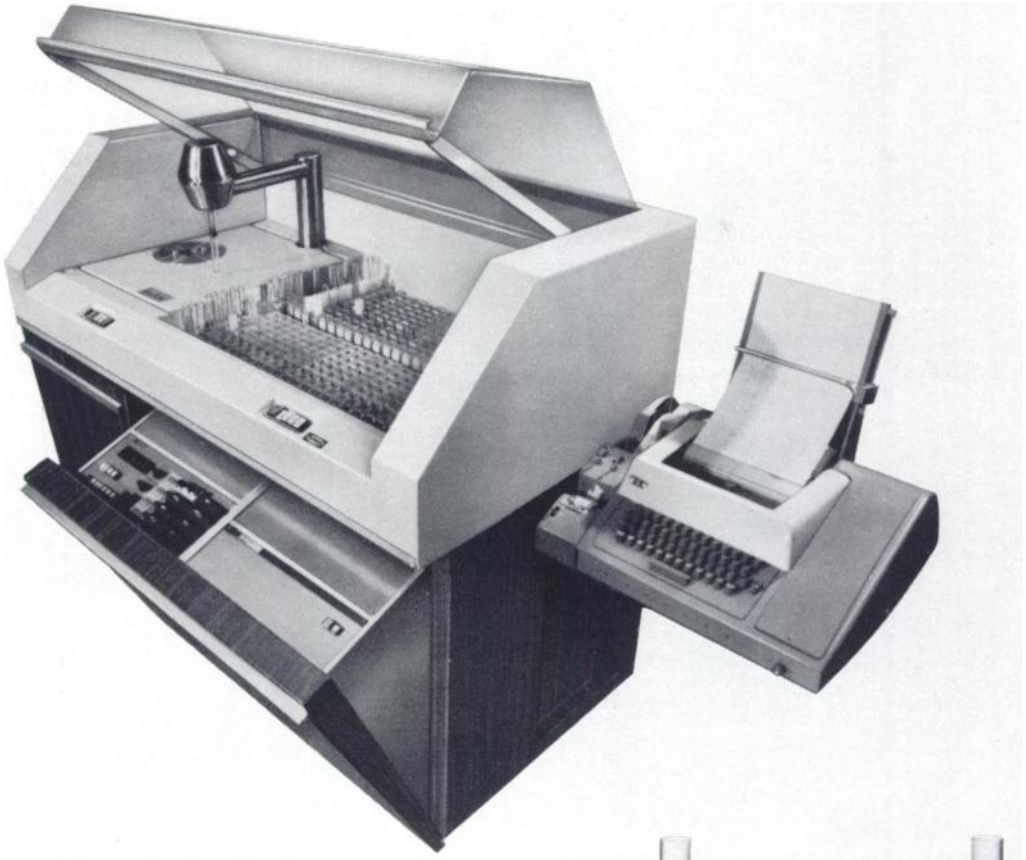

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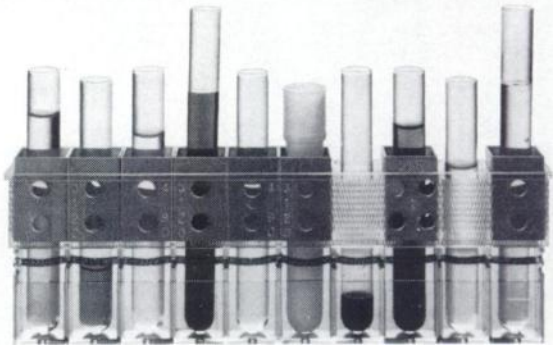

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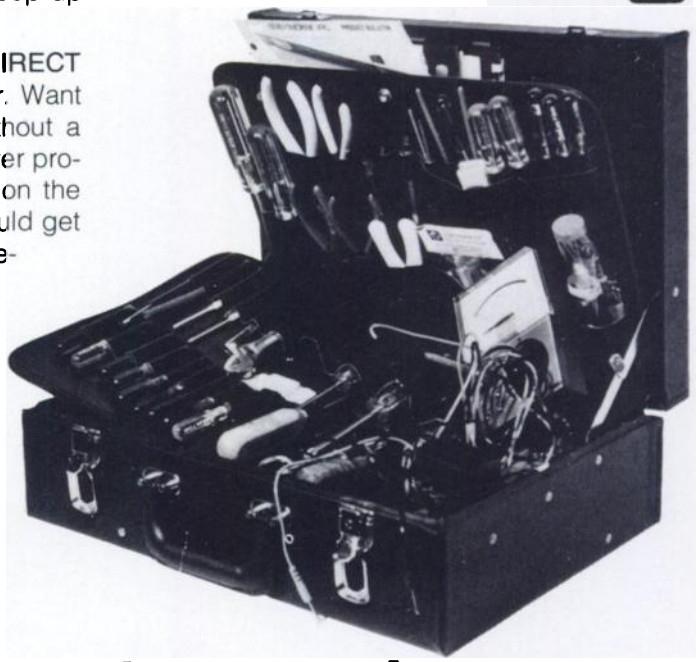

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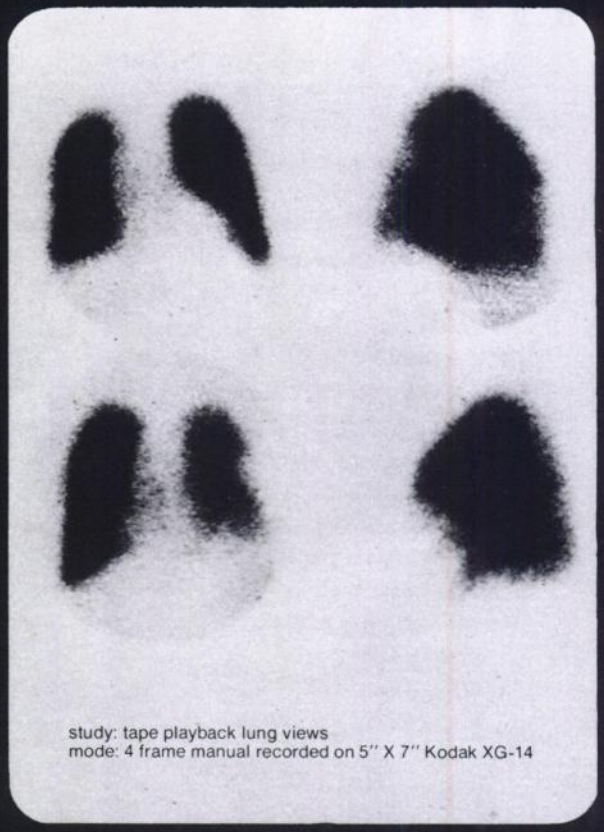

study: tape playback lung views
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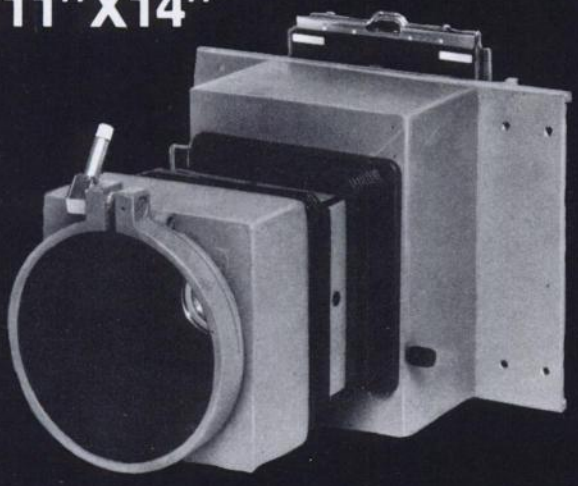

study: Tc 99 m pertechnetate renal flow
exposure: 0.8 seconds/frame
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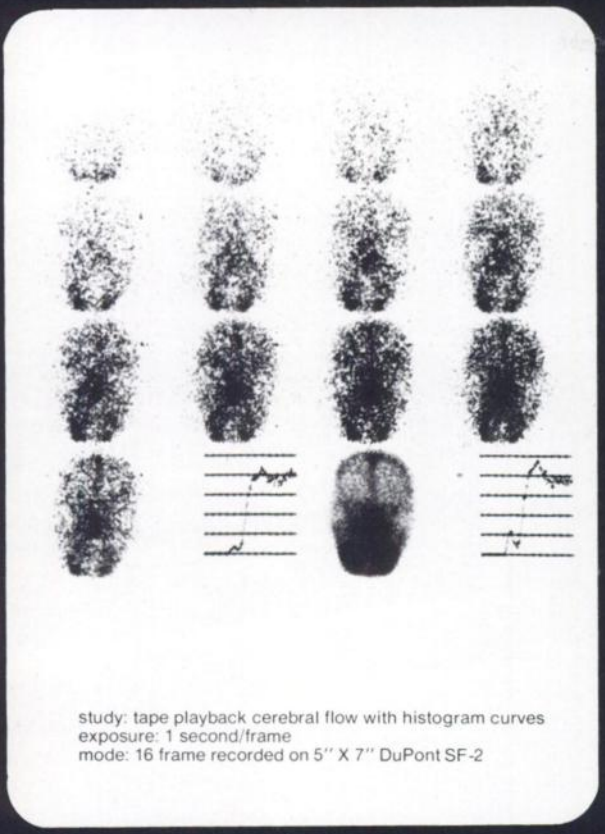
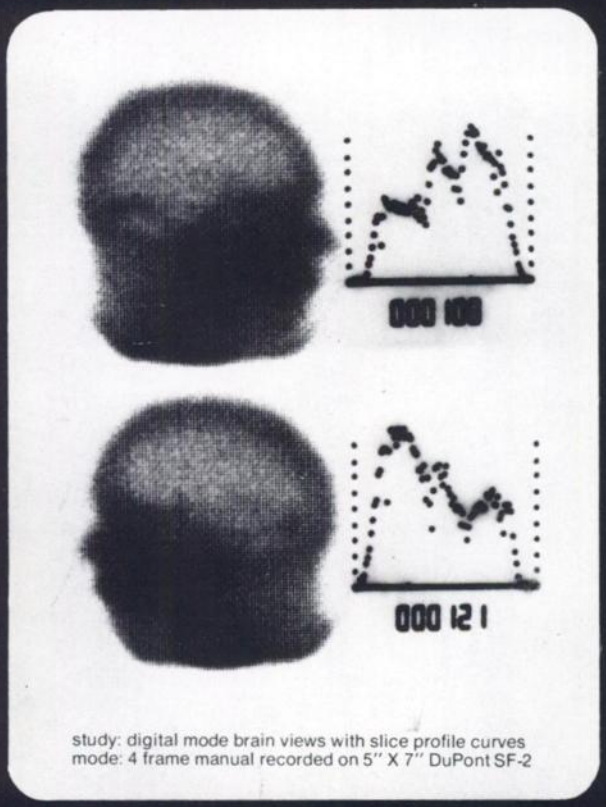


study: tape playback cerebral flow with histogram curves
exposure: 1 second/frame
mode: 16 frame recorded on 5" X 7" DuPont SF-2



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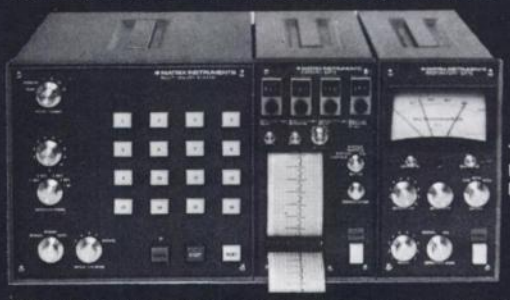

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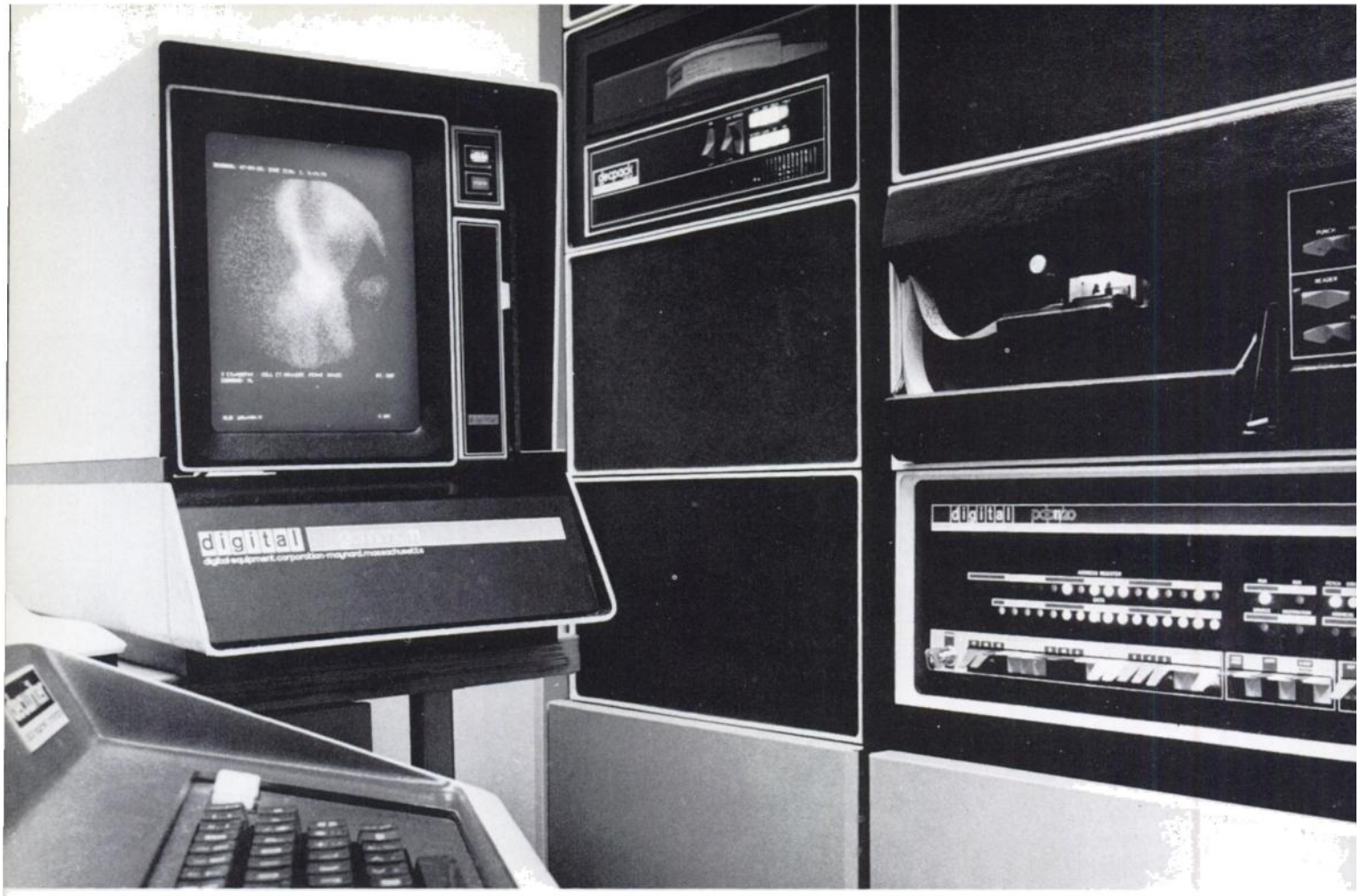

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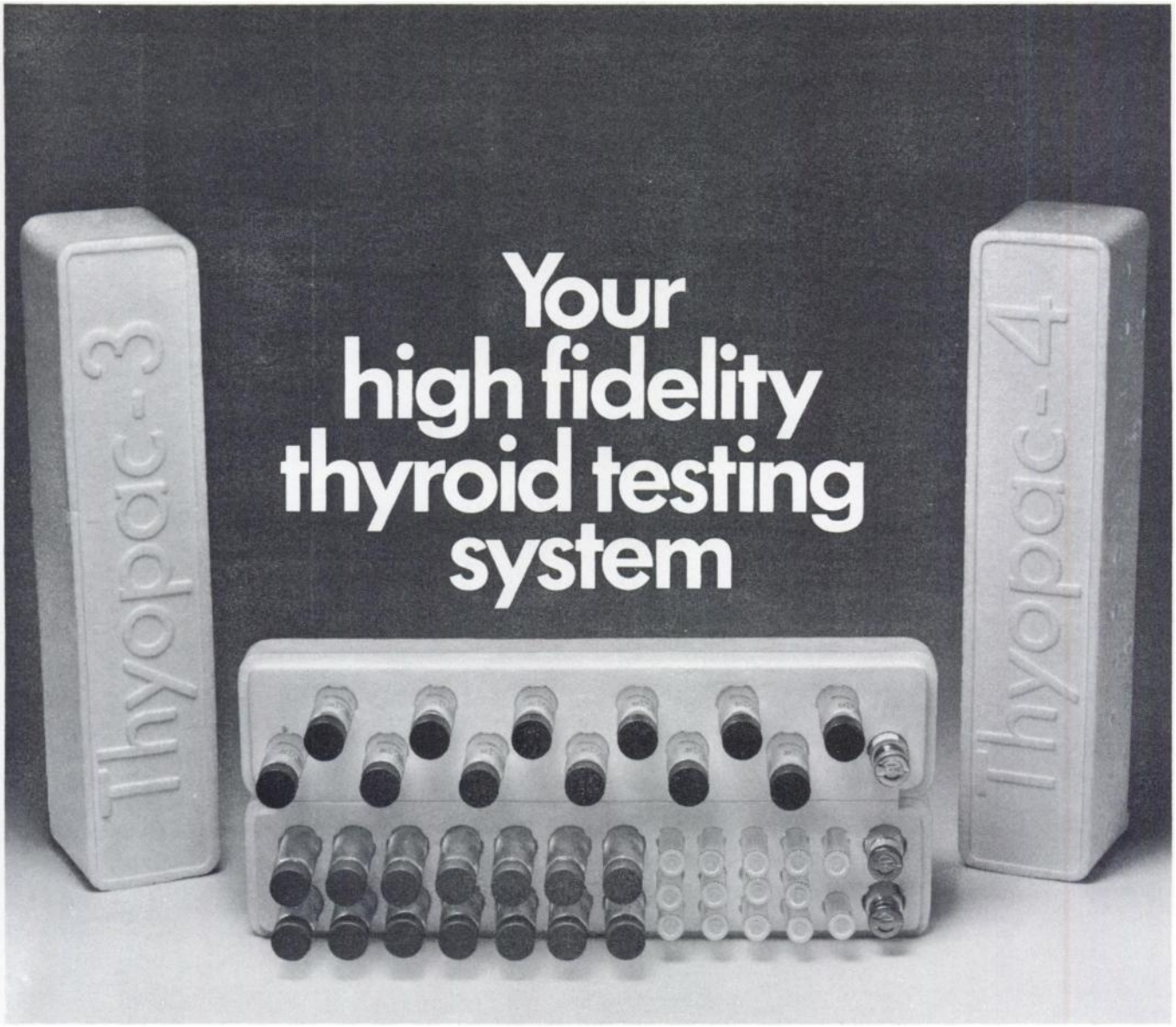

For estimation of T4, T3 binding capacity, or a precise Free Thyroxine Index; there are no simpler, faster or more accurate tests.

Every batch of Thyopac*3 and Thyopac*4 is tested against 11 different standards, covering the whole clinical range, for reproducibility and discrimination. The tests are repeated at expiry, thus assuring comparable results over the whole life of the kit.

- Samples for counting withdrawn at equilibrium
- Temperature control is not required
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Thyopac*-3&4

invariably the best thyroid function tests

*Trade mark

The Radiochemical Centre Amersham

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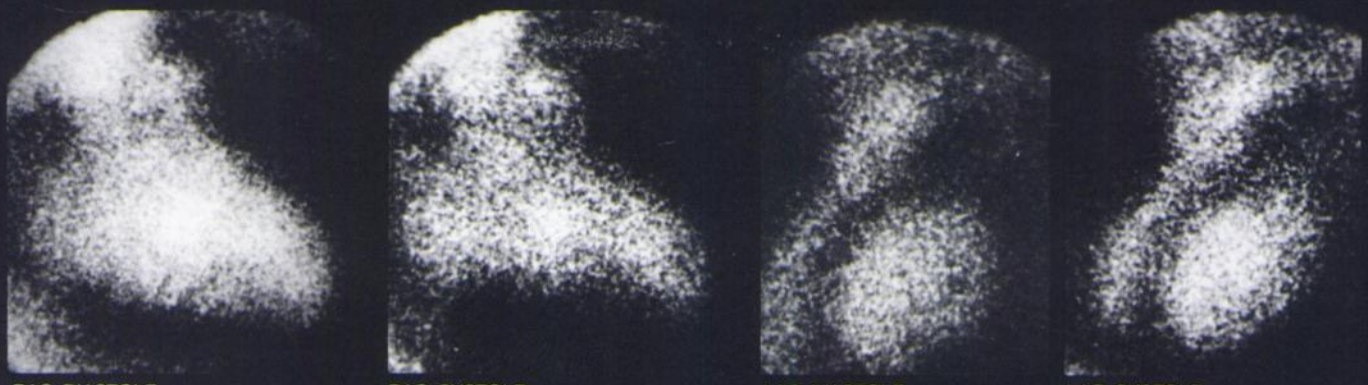
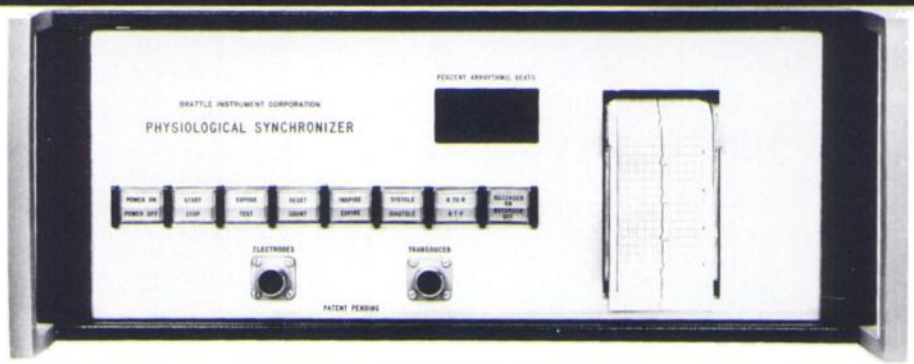
Help your cardiologist study heart kinetics non-invasively with Brattle-gated scintiphotos.



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. (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.



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 on the 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.

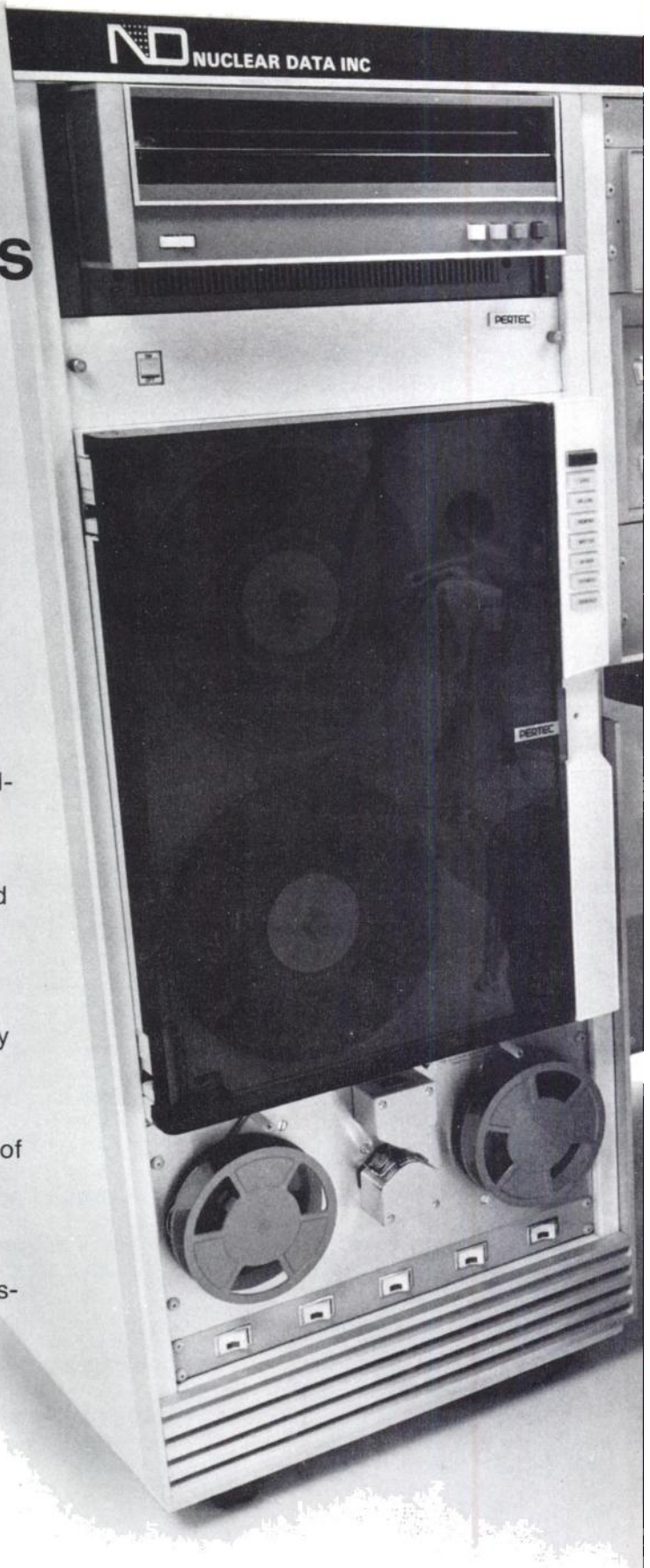
Some Brattles have been in clinical use for over 18 months—very good hospitals have them
Two of these hospitals, Johns Hopkins and Mass. General, have kindly supplied us sample clinical pictures which we'll gladly show you. And if you want references on effectiveness, reliability and safety, we'll supply them, as well as a bibliography on ten years' worth of medical uses of synchronization.

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.)

Brattle Instrument Corporation

767/C Concord Avenue • Cambridge, Massachusetts 02138 • 617-661-0300

Seven facts about computerized image processing and storage systems that our worthy competitors hope you never ever hear.



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

Fact: Our MED II has helped with more nuclear medical diagnoses than *any* similar system.

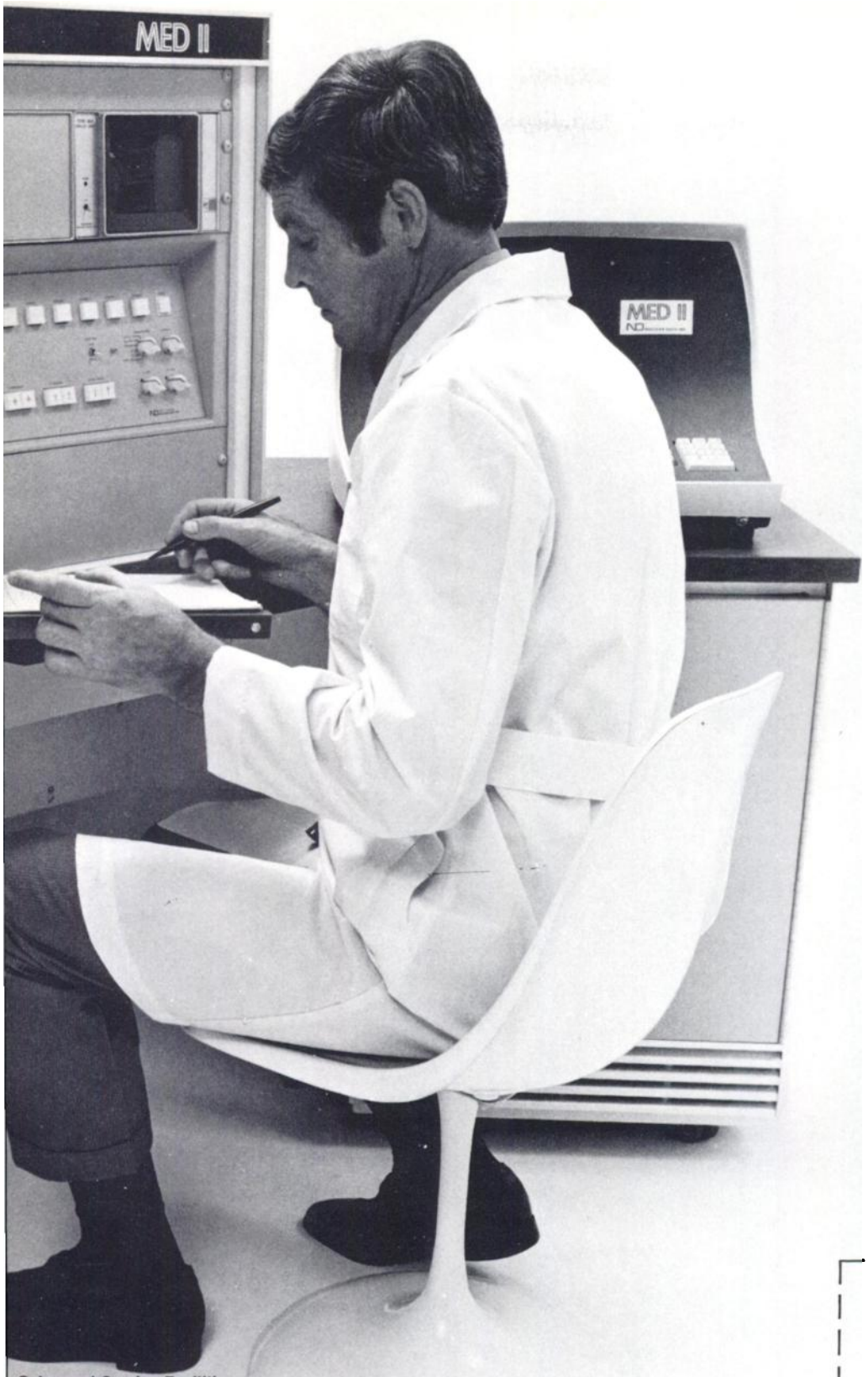
Fact: MED II has more clinical software actually available today. (See facing page.)

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

Fact: The MED II offers unmatched capability at an unparalleled $42,000. (And this is for a complete, fully operational system with a full 12-month warranty!)

Fact: Nuclear Data built the *first* commercial system of this kind and has had the most experience in interfacing computers with cameras.

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



Available Software

In Vivo Tests (Static)

Brain Imaging
Lung Imaging
Liver/Spleen Imaging
Kidney Imaging
Pancreas Imaging
Placenta Localization
Thyroid Imaging
Pericardial Effusion

In Vivo Tests (Dynamic)

Liver Function
Kidney Function
Cerebral Transit Time
Regional Cerebral Blood Flow
Carotid Blood Flow
Xenon Ventilation/Perfusion
Cardiac Ejection Fraction
Cardiac Output
Cardiac Shunt
Cisternography
Thyroid Function

In Vitro Tests

T3
T4
Red Cell Survival
Schilling

RIA Tests

Digitoxin
Digoxin
Human Growth Hormone
Anti Australian Antigen
Human Placental Lactogen
Insulin

Functional Software

Patient and Study Data with Every Record.
Tumor Registry
Uniformity Correction
Background Subtraction
Contrast Enhancement
Static Study Projection Display
Dynamic Frame Mode Acquisition
Dynamic List Mode Acquisition
Dual Isotope Acquisition and Subtraction
Dual Camera Acquisition
Formatted Administrative Data with 3,000 Characters of Free Text.

Mathematical Functions for Data Manipulation

Subtraction
Addition
Multiplication
Division
Integration
Differentiation
Modulation Transform Functions for Camera Evaluation
Curve Smoothing (from 2 to 15 points)
Curve Fitting
Curve Averaging (from 2 to 15 points)

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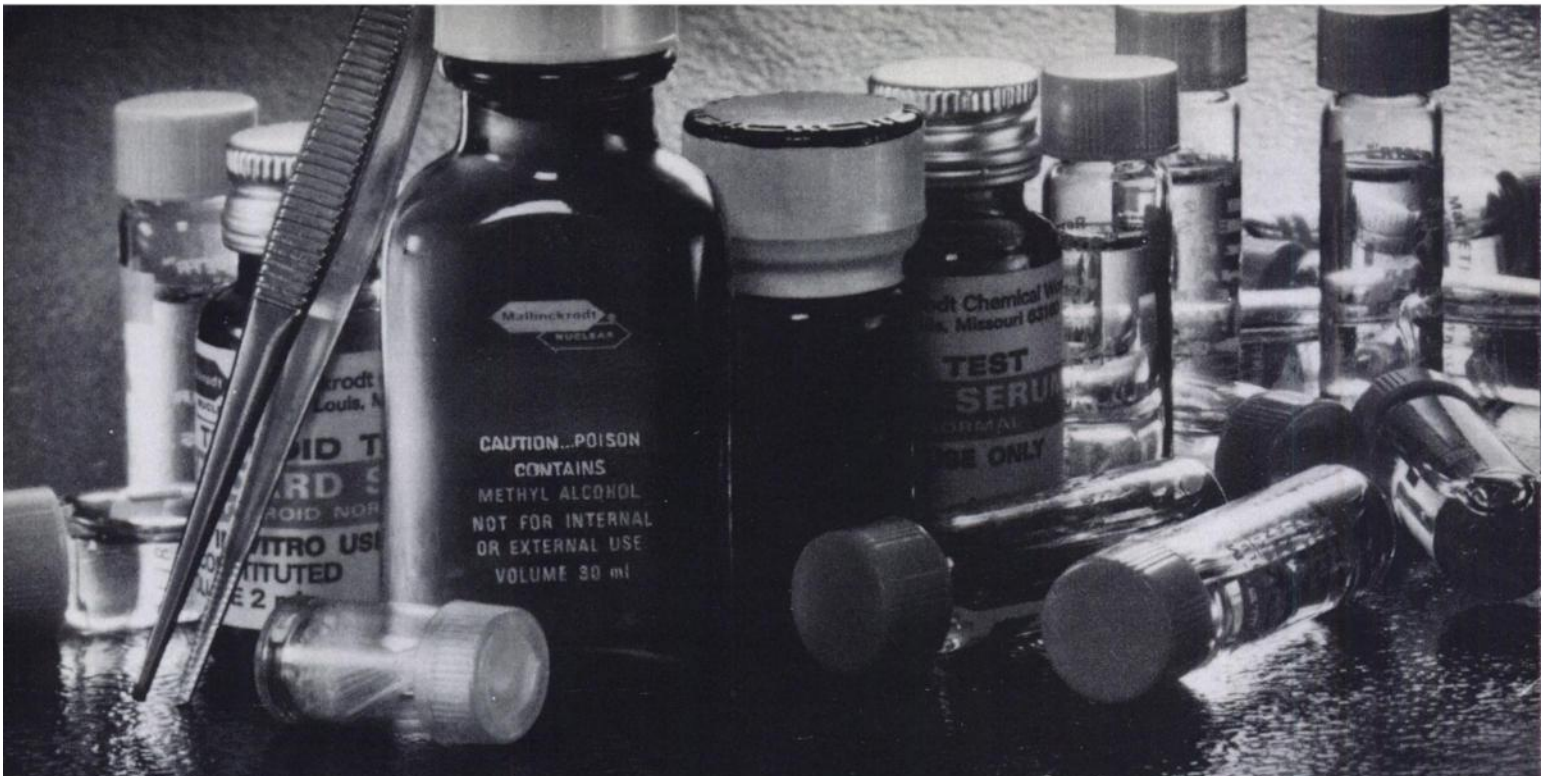

The Res-O-Mat® ETR® Test for thyroid function: what it can do, can't do and needs to do.

What the **ETR** test can do is deliver fast, highly accurate diagnosis of thyroid function. It's the first in vitro test to consider simultaneously total T4 concentration and the degree of hormone saturation of protein binding sites.[1]

It completely obviates the effects of pregnancy, the pill, iodides and many commonly used drugs. They don't even figure in the test system.

Based on actual clinical evaluation, this test has been shown to have a high degree of correlation with the true thyroid function of the patient.[2] [3] The **Res-O-Mat ETR** test has proven to be an extremely valuable method of monitoring thyroid therapy.

What the **Res-O-Mat ETR** test doesn't do is talk the routine language of traditional thyroid tests. It talks in **ETR units.** Precise, informative, but somewhat different. The test doesn't reflect protein abnormality. It isn't designed to. Its specific job is determining thyroid performance.

What the **ETR** test needs to do is to get a chance to prove itself to you. It's unfamiliar, so it's easy to resist. Those who have tried it usually see its advantages right away. They find themselves with a fast, highly accurate test.

Isn't that worth looking into?

(1) Mincey, E. K., Thorson, S. C., and Brown, J. L., et al.: A new parameter of thyroid function – The effective thyroxine ratio. J. Nucl. Med. 13:165-168, February 1972.

(2) Gladding, T. C.: Effective thyroxine ratio (ETR) – A new test for thyroid function. J. Tenn. Med. Assn. 65:442-444, May 1972.

(3) Murray, I. P. C., Parkin, J., and Gubanyi, M.: The "Effective Thyroxine Ratio" in the assessment of thyroid function. Med. J. Australia 1:1190-1193, June 3, 1972.

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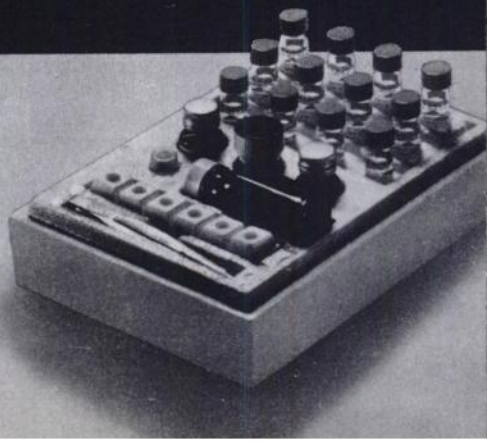

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- No more overnight assays
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- No more patient sample dilutions
- Same day results

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.
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4. Aspirate and wash.
5. Count the coated tubes.

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:

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For full details contact:

Clinical Assays, Inc.

or call the nearest Fisher Scientific for fast service.

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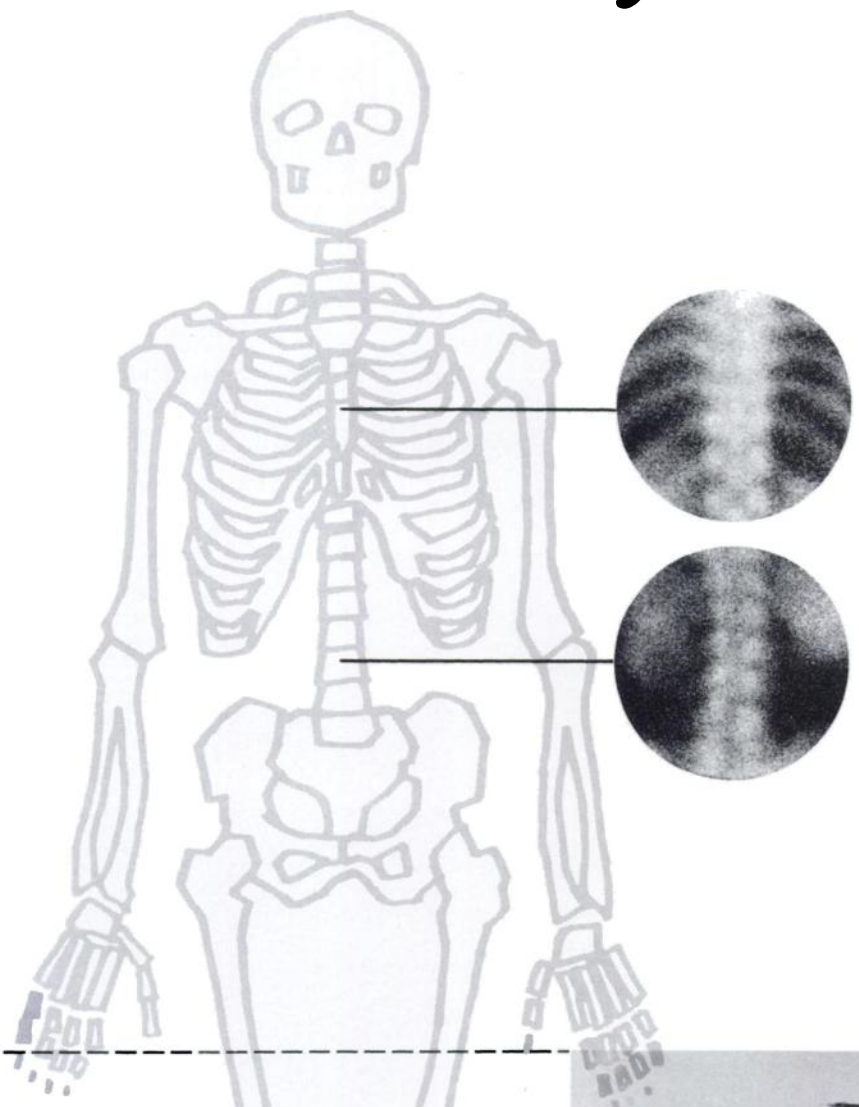
Get the inside story.



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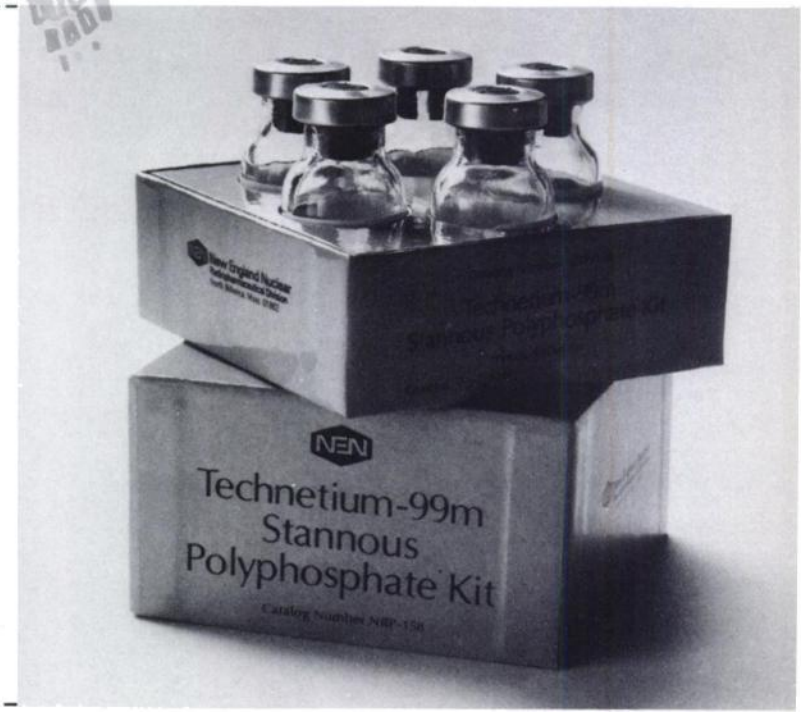
Telephone (617) 667-9531



Canada: NEN Canada Ltd., Dorval, Quebec, Tel: (514) 636-4971, Telex: 05-821808
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The thyroid machine that does everything but mail in the test results!

At last...one instrument that counts and computes all three of the major thyroid function test values for you. Now, all you do is push the buttons. The digital read-out shows the T3*, T4 and Effective Thyroxine Ratio test values. No ratios to figure. No curves to draw. The laboratory is spared time, extra work, and concern.

The new ACCUWELL COMPUTER simplifies T3, T4 and Effective Thyroxine Ratio tests still more with its push-button sequencer that shows the counting procedure required for each test...step-by-step.

The ACCUWELL COMPUTER automatically subtracts background. Totally push-button operated. Complete solid-state, self-contained counting and computing (includes well counting flexibility for iron binding, RIA and other work). A unique instrument that makes thyroid testing as easy as it should be...as an ACCUWELL demonstration will quickly show. Mail coupon now or call (314) 731-4141.

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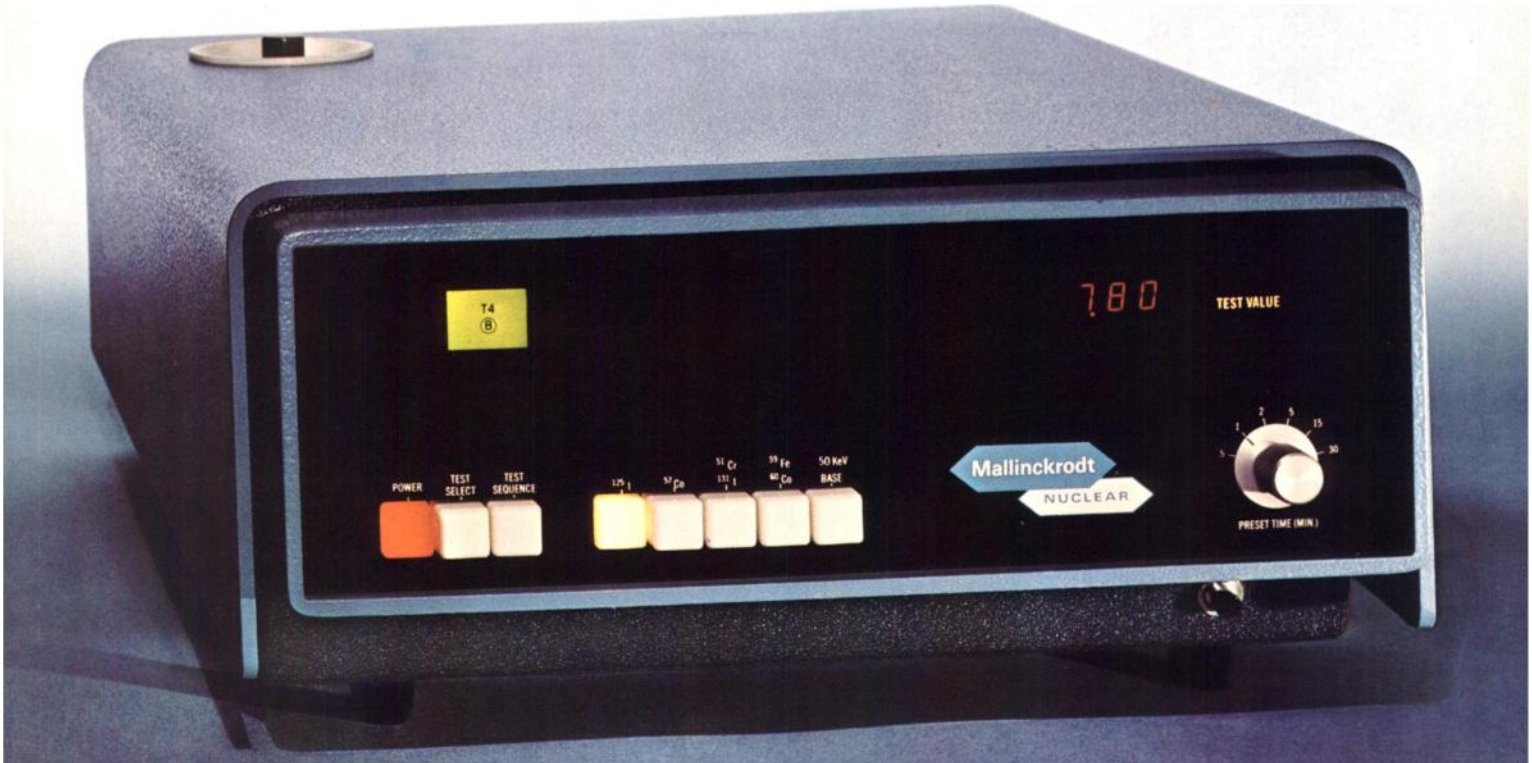

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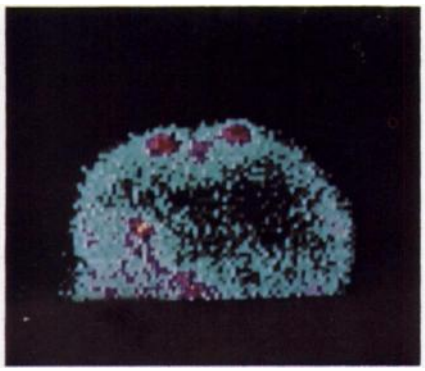
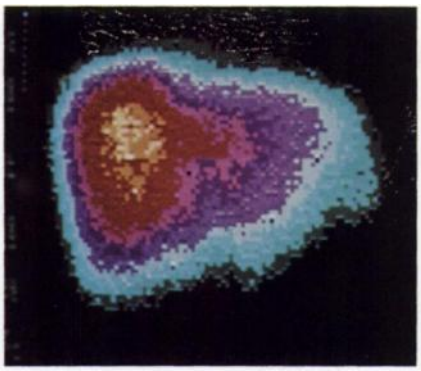
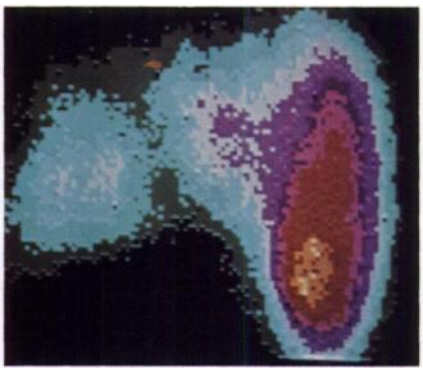


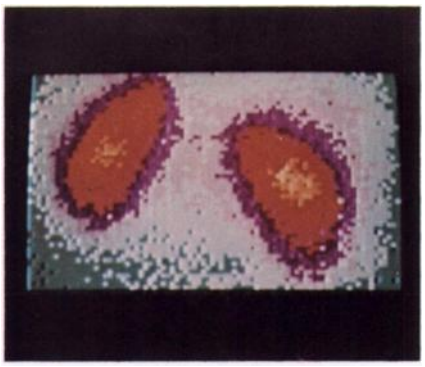
Abnormal Lt. Lat. brain-bone scan



Normal ant. liver scan

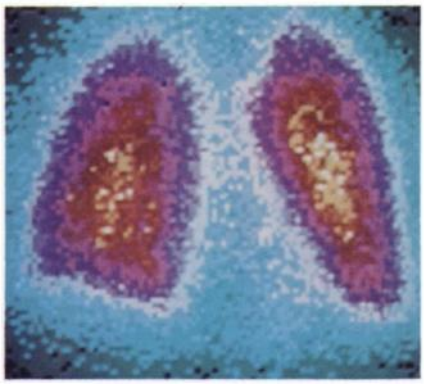


Ant. cirrhotic liver scan



Normal kidney scan

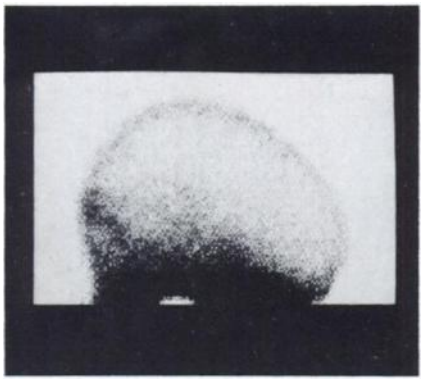
system 70 the camera



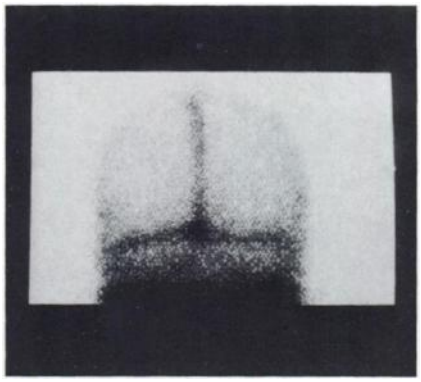
Normal ant. lung scan

Nuclear medicine is predominantly a visual discipline. Static imaging represents 50-70% of the daily patient work-load. Baird-Atomic, recognizing this need, offers in its SYSTEM SEVENTY not only the best static resolution available today, but also the most versatile in image presentation, viz., digital color, black-and-white Polaroid, 70mm, 35mm, and multi-imaging on X-ray film.

In the past, the difficulty of rapid data analyses of quantitative dynamic function studies has inhibited their growth. However, nuclear medicine is developing, and quantitative brain, kidney, and heart dynamics are becoming a valued part of the nuclear diagnostic work-up. Hence, the need for a camera which can

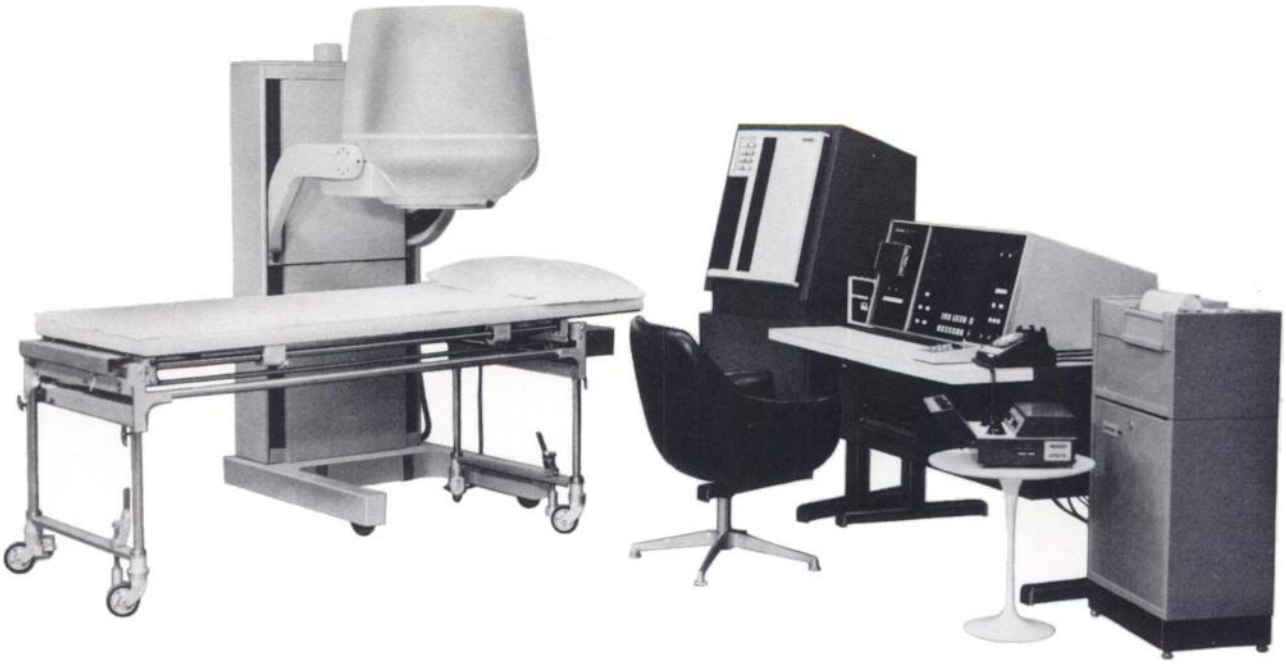


Normal Rt. Lat. brain scan



Normal post. brain scan

For the physicist! Study of the "original" bar phantom showing excellent resolution of the 4/32" bars.



for all reasons

deliver these fast analyses and grow with your department, whichever direction it takes.

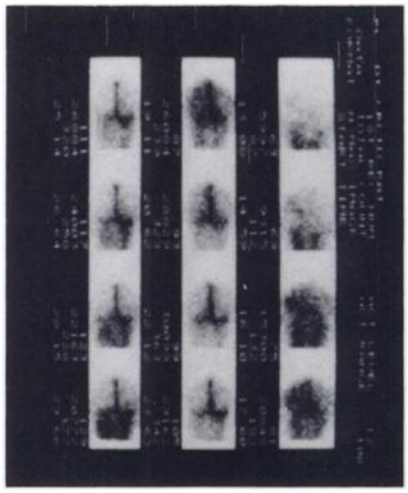
Baird-Atomic, with its computerized camera, allows dynamic function studies to be produced routinely . . . another plus factor added to your diagnostic procedures.

SYSTEM SEVENTY is, indeed, the camera which supplies both capabilities and is "the camera for all reasons."

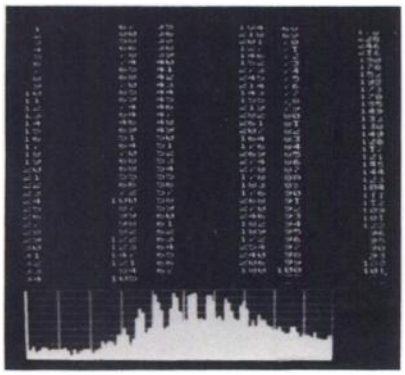
BAIRD-ATOMIC

Nuclear Division, 125 Middlesex Turnpike, Bedford, Mass. 01730, 617/276-6000, Telex: 923491, Cable BAIRDCOBFRD

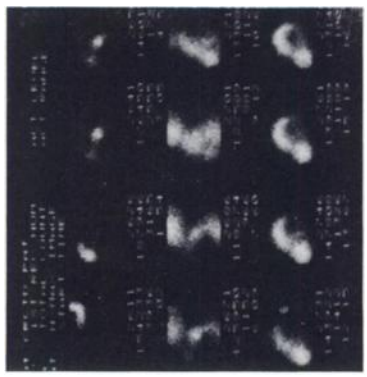
See this system in operation at the San Diego exhibition, Society of Nuclear Medicine, Booths 166-168, 173-178.



Cerebral blood flow study demonstrating delayed perfusion in the right hemisphere.

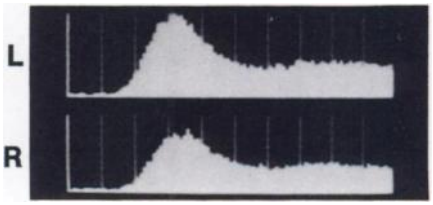


Normal Lt. ventricular curve ejection fraction .60



Normal cardiac blood flow

Quantitative brain dynamic showing 30% decreased perfusion on right side.



Curves produced in less than 30 seconds after conclusion of patient study.

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.

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- 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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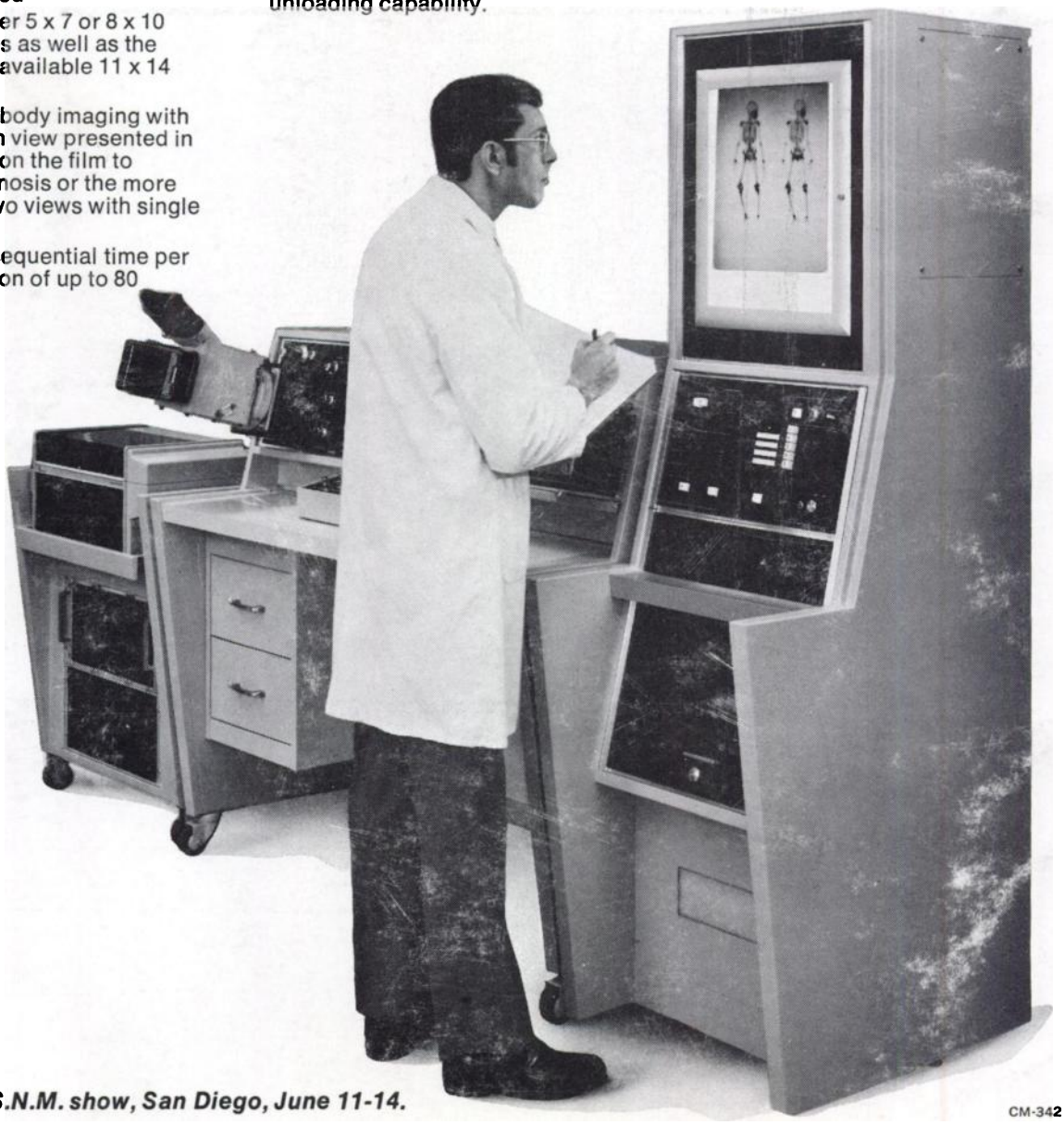

See us at the S.N.M. show, San Diego, June 11-14.

CM-342