

MEDI+PHYSICS'

Daily

is like having  
your own  
radiopharmacist  
and cyclotron.

# Service

**You should be able to get radiopharmaceuticals reliably, any time, and on short notice.**

**Medi+Physics has developed a network of service laboratories throughout the country. They can deliver the radiopharmaceuticals you need in a day or less.**

**Now you can order late today and receive shipment by tomorrow morning. And for most of the U.S., deliveries are made by dependable, surface transportation.**

***Result—better service than ever on your radiopharmaceutical requirements. Call the Medi+Physics laboratory nearest you.***

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# T3+T4 Test- kit

Radiodiagnostics  
easy – safe – rapid

For the  
determination  
of thyroxin binding  
capacity and  
total thyroxin  
in serum



**Two  
time-saving tests  
for your lab.:  
pipette once,  
incubate for one hour,  
automatic  
phase separation,  
measure.**

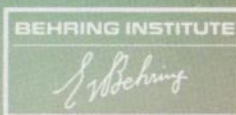
**Contents T 3 kit:** 12 calibrating tubes with 3.4 ml thybon® (J-125)-solution each • total activity: 3 µCi J-125 • preservative: 0,02% sodium azide • 12 adsorption tubes • 1 ml standard serum of defined TBG capacity •

**Storage:** store protected from light in the refrigerator at +4° to +6° C  
**Stability:** 8 weeks at proper storage. The expiry date is indicated on the package.

Order No.: J 5113  
for T 3      1 package 12 tests

**Contents T 4 kit:** 12 calibrating tubes with 3.3 ml TBG-T 4- (J-125)- solution each • total activity: 1 µCi J-125 • preservative: 0,02% sodium azide • 12 adsorption tubes • 1 standard serum of defined T 4-concentration •

Order No.: J 5114  
for T 4      1 package 12 tests



# You can increase patient scan capacity 25% or more with a Cameray® gamma camera. We can prove it.

We have proven it. On patients.  
In major clinical evaluation programs.

It's not surprising. Cameray was designed specifically to simplify scanning procedure as well as to improve scan quality: As a result, Cameray will cut the technician's time and increase the productivity of any nuclear medicine facility. Here's why:

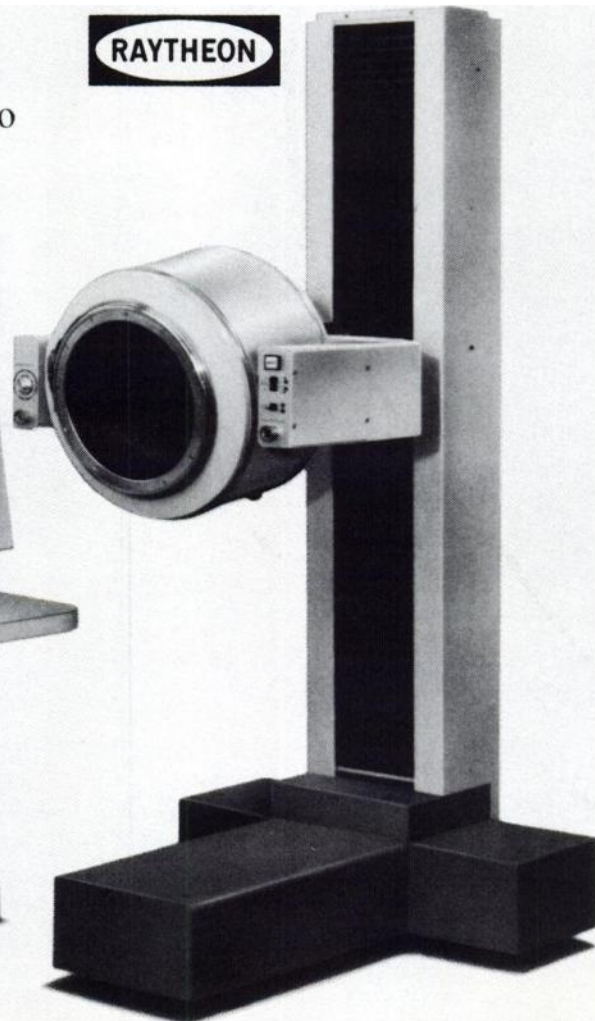
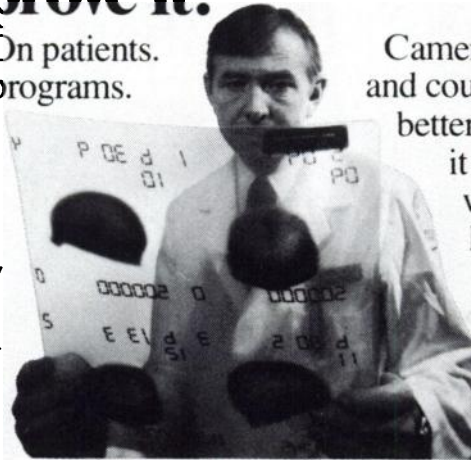
- All controls more accessible — because they are all on the console control panel.
- Patient numerics right on film for improved efficiency and confidence in accuracy.
- Collimators designed for quick changes.
- Repeatability assured from scan to scan without recalibration.
- Optional x-ray matrix feature built in — not an add-on.

Cameray's uniformity, resolution and count rate are equal to or better than competitors'. And it can be easily updated for whole body scanning in less space than competitive equipment.

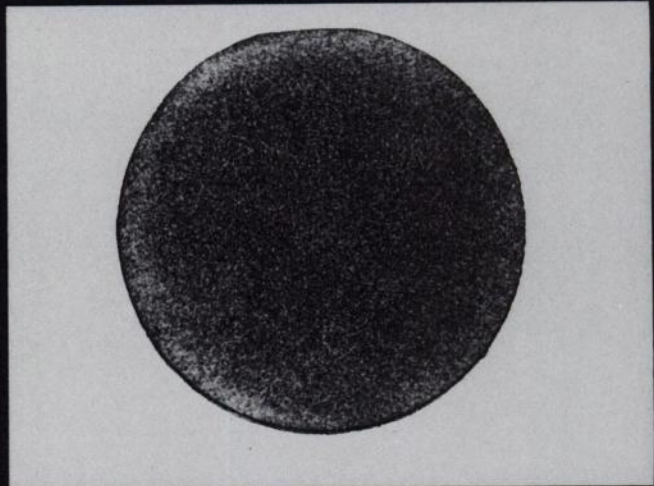
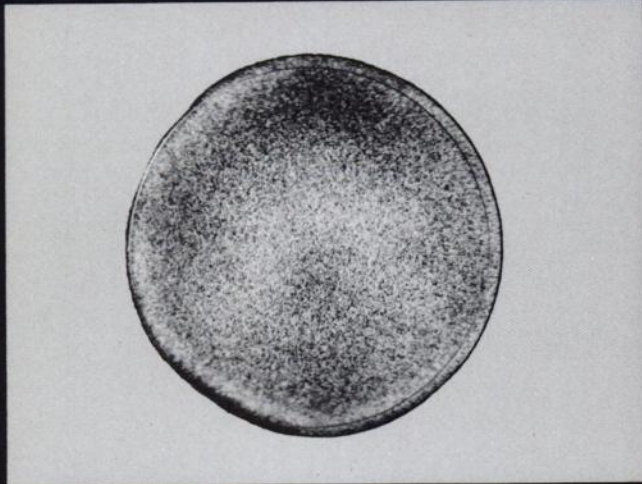
There are a lot more facts to know about the competitively-priced Cameray and what it can do to improve

gamma scan efficiency for you.

To get full details, contact Raytheon Company, Medical Electronics, Fourth Avenue, Burlington, Mass. 01803. 617 272-7270.



# How about a physical checkup for your camera?



It's a simple matter with our flood source, and you'll know immediately if unbalanced photo-multipliers are interfering with diagnoses.

The flood source (1mCi,  $^{57}\text{Co}$ ) is a solid, light, flat disk 13.5" in diameter, precision made to provide uniform radiation over the entire surface ( $\pm 5\%$  or better). No liquids to mix, spill, or dispose of, and the camera collimator can remain in place. The checkup is so simple it can (and should) be performed daily.

New England Nuclear has years of experience and numerous products in the field of nuclear instrumentation calibration. Let us send you further information.



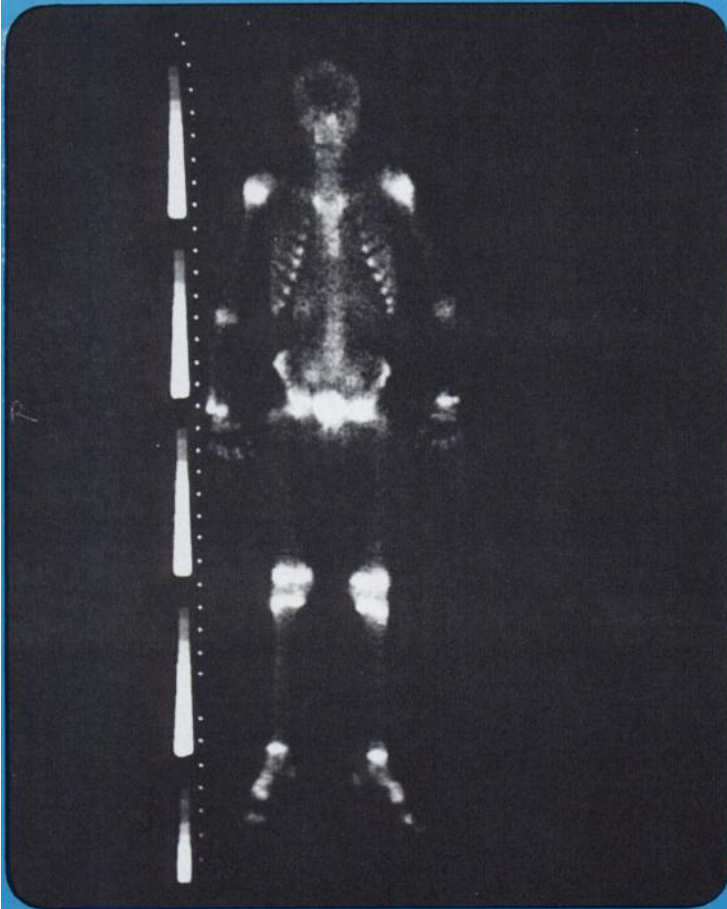
## **New England Nuclear Radiopharmaceutical Division**

Atomlight Place, North Billerica, Mass. 01862  
Telephone (617) 667-9531

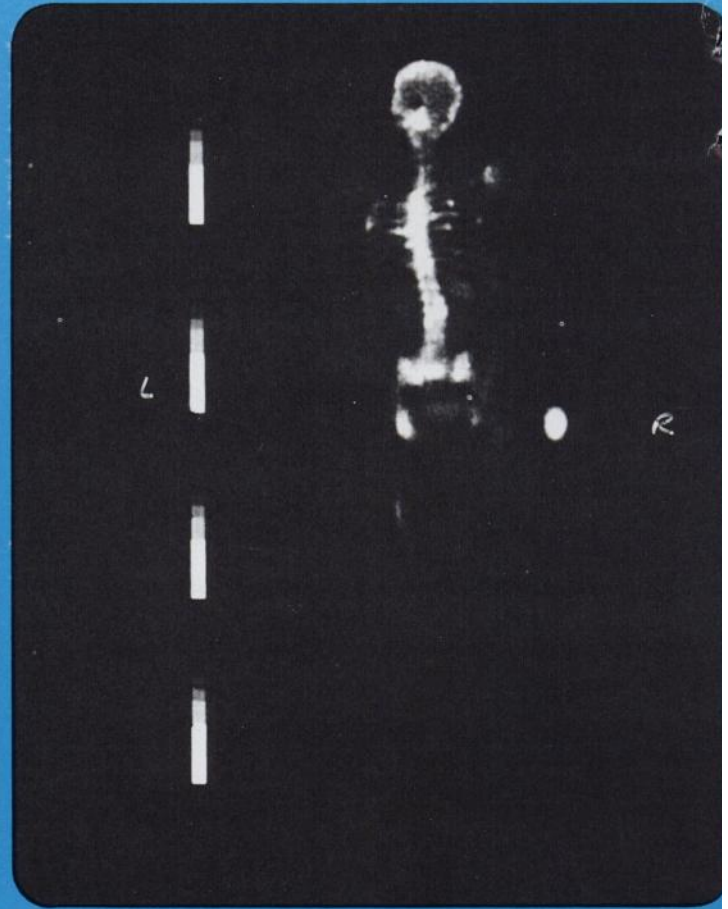
Canada: NEN Canada Ltd., Dorval, Quebec, H9P-1B3,  
Tel: (514) 636-4971, Telex: 05-821808

Europe: NEN Chemicals GmbH, D6072 Dreieichenhain,  
Siemensstrasse 1, W. Germany. Tel: Langen (06103) 85035

# Cleon Whole-Body Imager produces patient studies like these... IN 16 MINUTES OR LESS

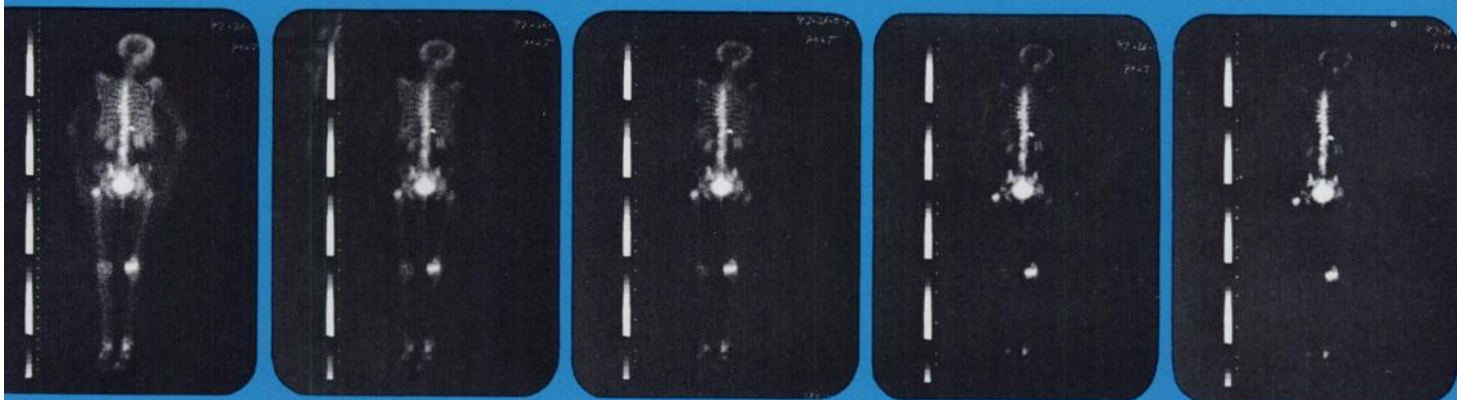


BONE IMAGE OF 13-YEAR-OLD BOY, ANTERIOR.  
SCANNING AGENT =  $^{99m}\text{Tc}$ -POLYPHOSPHATE.  
LENGTH OF SCAN = 160 CENTIMETERS.  
TIME OF SCAN = 16 MINUTES.  
ID AT STERNUM = 416 CTS/CM<sup>2</sup>.



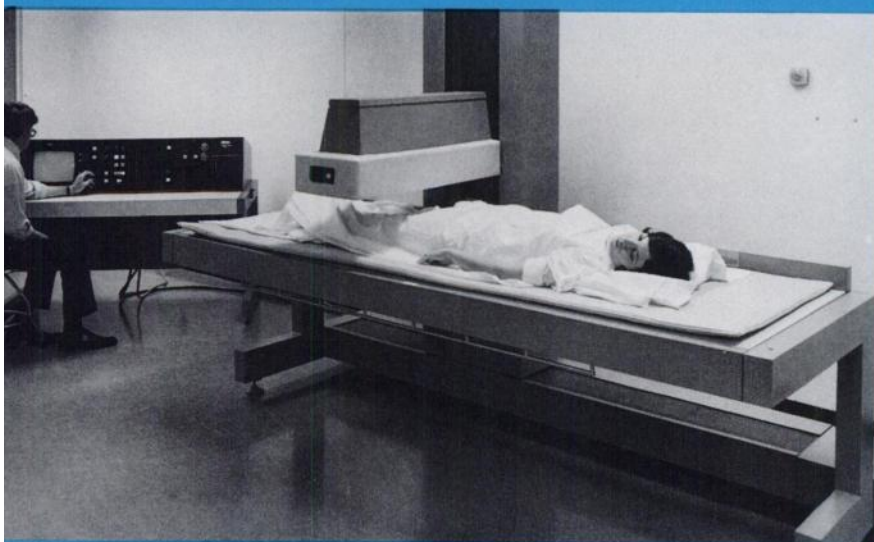
BONE IMAGE OF 56-YEAR-OLD WOMAN, POSTERIOR.  
SCANNING AGENT =  $^{99m}\text{Tc}$ -PYROPHOSPHATE.  
LENGTH OF SCAN = 160 CENTIMETERS.  
TIME OF SCAN = 16 MINUTES.  
ID AT CERVICAL SPINE = 552 CTS/CM<sup>2</sup>.

# . AGAIN, AND AGAIN, AND AGAIN



ONE IMAGE OF 52-YEAR-OLD WOMAN, POSTERIOR.  
SCANNING AGENT =  $^{99m}\text{Tc}$ -POLYPHOSPHATE.  
LENGTH OF SCAN = 160 CENTIMETERS.  
TIME OF SCAN = 16 MINUTES.  
COUNT RATE AT CERVICAL SPINE = 296 CTS/CM<sup>2</sup>.

(IMAGES PHOTOGRAPHED FROM MAGNETIC DISC STORAGE SHOWING EFFECT OF INCREASING BACKGROUND SUPPRESSION.)



WHOLE-BODY IMAGER INSTALLED AT THE NUCLEAR MEDICINE DEPARTMENT,  
NEW ENGLAND MEDICAL CENTER HOSPITAL, BOSTON, MASSACHUSETTS, U.S.A.

With Cleon, high-speed whole-body imaging becomes a clinical reality.

Reduced time-to-scan and increased information content are made possible by a single, silent sweep of the 24-inch wide crystal array from head to foot of the patient. Information once recorded can be played back repeatedly for study or for re-photographing with different values of exposure and background.

Clinicians and technologists are discovering advantages that make the Cleon instrument a "whole new ball game" in whole-body and organ imaging: dual detector heads . . . rapid diagnoses . . . high patient turnover . . . easy operation . . . less patient discomfort. To receive a brochure and other information, call or write to Paul Theriault, Sales Manager.

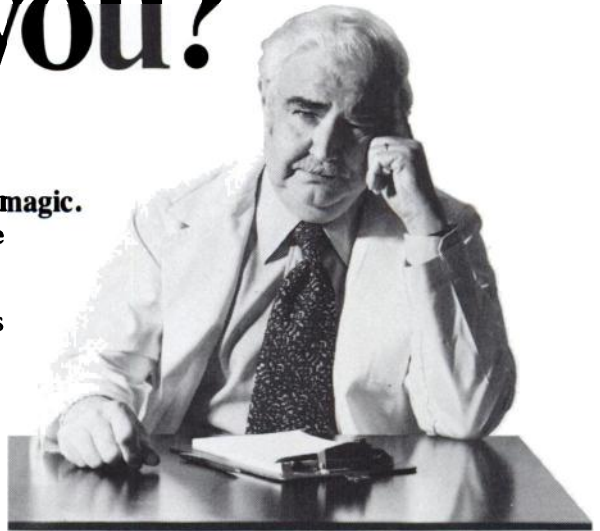
**cleon**  
CORPORATION

150 Gould Street, Needham, Massachusetts 02194/ Telephone 617-444-2494

# Is radioassay testing taboo for you?

If you think the answer is "yes," then radioassay (RIA) must seem like black magic. Fisher believes facts alone will convince you it isn't.

**Fact No.1** In many progressive hospitals today (and in research centers for years), radioassay testing has proven itself the most sensitive and specific method of testing hormones, steroids, and certain drugs. For these, RIA is unequivocally the method of choice.



**Fact No.2** In five years, RIA will become commonplace in many more hospitals, including community hospitals, because of its outstanding sensitivity and specificity.

What's more, the community hospitals will appreciate RIA's simplicity, safety, and economy.

**Fact No.3** The economics of RIA have a definite dollar-and-cents appeal. What hospital today can afford to overlook that point?

**Fact No.4** Yes, RIA does use radioactive material — but in low levels. It's not to be feared just understood.

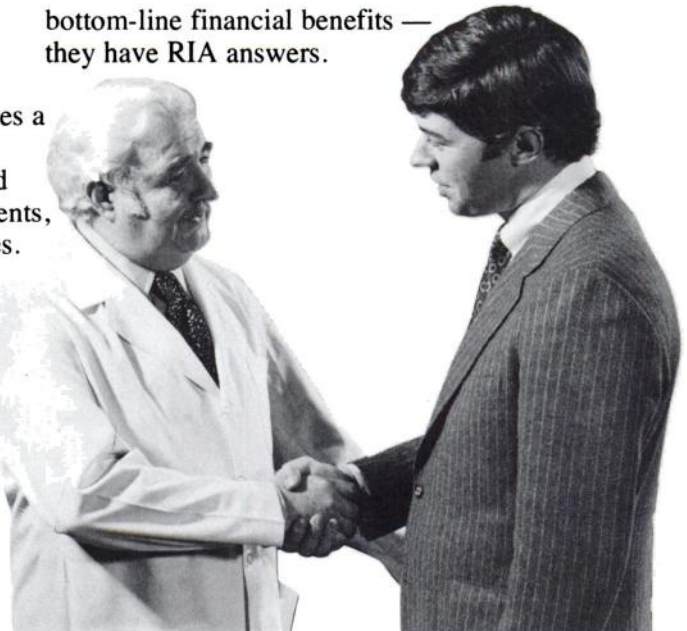
**Fact No.5** Fisher has developed an RIA program that is second to none. Our program leaders are the most knowledgeable and accessible RIA experts anywhere. Ask them about gamma counters . . . test kits . . . initial investment . . . bottom-line financial benefits — they have RIA answers.

**Fact No.6** The Fisher RIA program includes a firm commitment: Fisher RIA experts will constantly survey the entire marketplace and make available to you the best RIA instruments, equipment, chemicals, test kits, and supplies. No other company can offer you more.

Call Fisher for an informative RIA conference. You have many facts to gain and nothing to lose but your taboo. Why RIA? — Why not!



**Fisher Scientific Company**







**the image quality  
and exact  
diagnostic format  
you need**

## **Searle Micro Dot Imager**

*Static, dynamic & whole body imaging ... 15 formats, 3 film sizes*

The Searle Micro Dot Imager offers Pho/Gamma users a versatile display system for single-organ or whole body imaging using economical X-ray film. Three film sizes and 15 image formats let you choose the exact format best suited for any study. State-of-the-art optics and electronics put as many as 80 images on one film with single-image fidelity. You can even mix static, dynamic and different size images on the same sheet of film. An exclusive, lightweight cassette design speeds and simplifies loading and unloading of film.

The Micro Dot provides distinct, well-focused scintidots in all image sizes; it gives you superior imaging clarity, constant focus and freedom from astigmatism regardless

of dot intensity and location. Absolute exposure control — with pushbutton settings for routine studies — assures correct, repeatable exposures from day to day and month to month in all image sizes.

Designed for clinical utility and operational simplicity, the Micro Dot Imager is the most complete display system available for the Pho/Gamma Scintillation Camera. For more information — including complete specifications — just write or phone your Searle representative. He'll be glad to show you how it can add unmatched versatility, convenience and economy to your laboratory's gamma imaging capabilities.



**SEARLE** **Searle Radiographics Inc.**

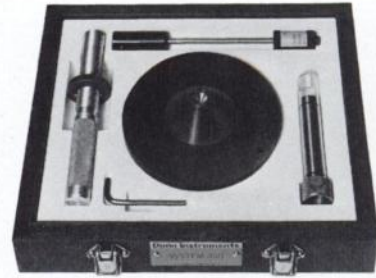
Subsidiary of G. D. Searle & Co.  
2000 Nuclear Drive, Des Plaines, Illinois 60018  
Phone 312-298-6600

# epiphora or crocodile tears?

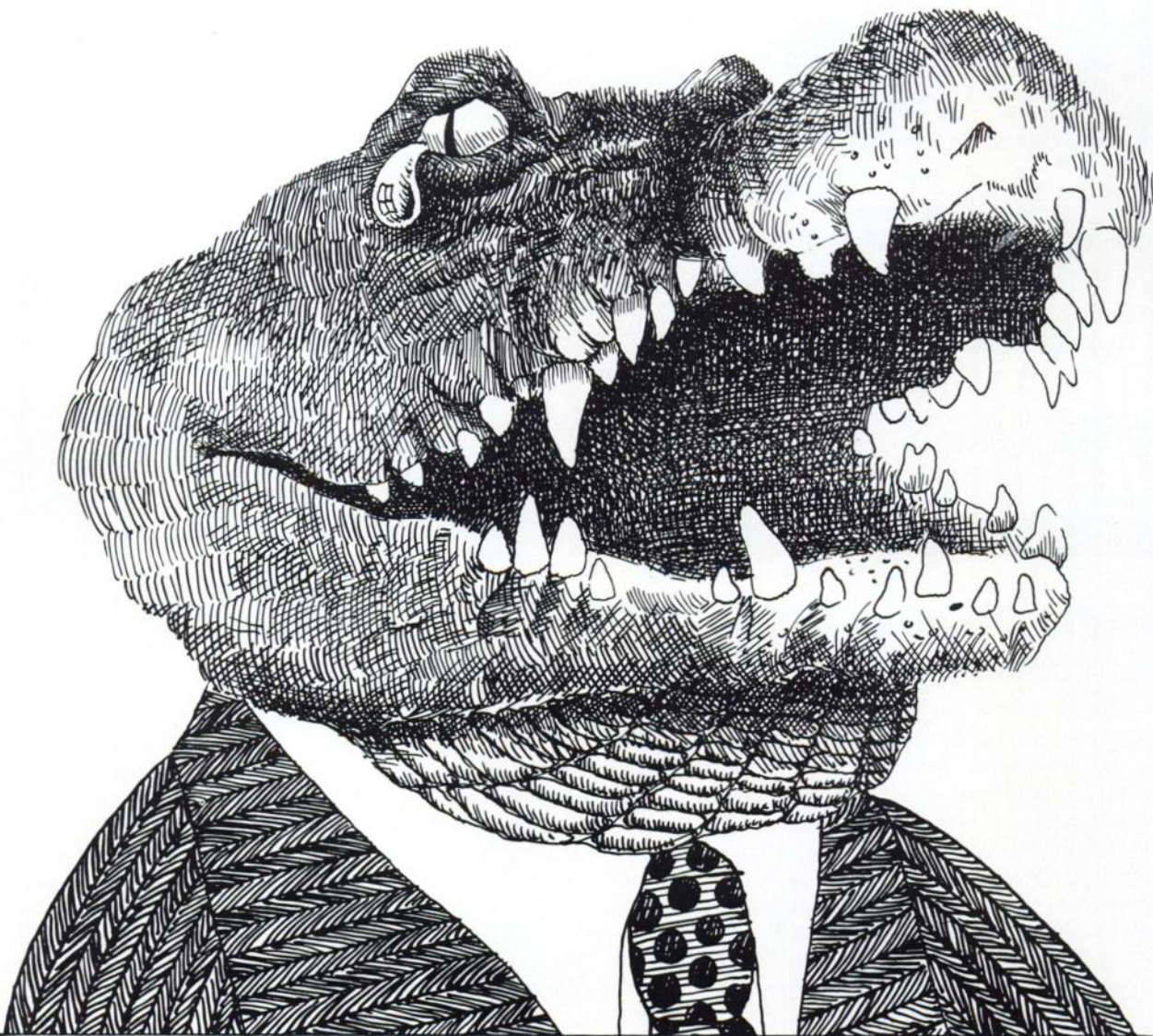
Find out with microscintigraphy, ophthalmology's new diagnostic tool to evaluate the patency of the lacrimal drainage system. All your nuclear medicine department needs is the new System 350 Micropinhole Collimator\* from Dunn Instruments and you're in business. You simply trace a radioactive tear with the gamma camera. The technique is fast, safe and inexpensive, involving no increase in lacrimation, no cath-

\*Patents Pending

erization of the canaliculi. This means no alteration of the physiology and anatomy, perhaps its major advantage. And, like all nuclear studies, you get hard copy records for future study and comparison. Microscintigraphy provides an accurate physiologic picture making it an excellent tool to study in vivo the dynamics of lacrimal drainage in all age groups. Best of all, it's painless. That's especially important when examining crocodiles.



**Dunn  
Instruments Inc**



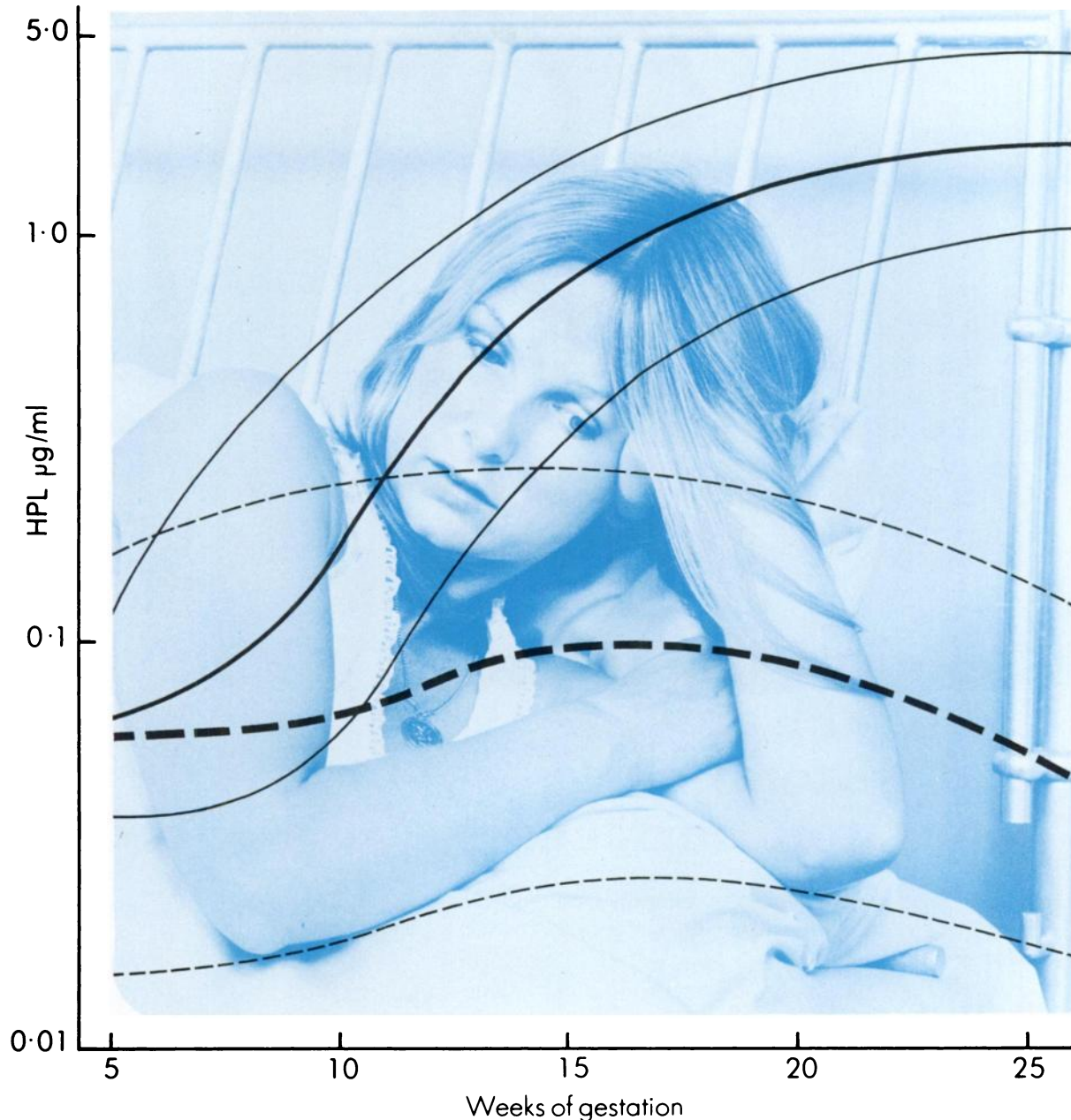
**Send Crocodile Coupon to: Dunn Instruments Inc, 52 Colin P. Kelly Jr. Street, San Francisco, Ca. 94107 (415) 957-1600**  
Yes, I am requesting information (clinical reprints of lacrimal studies included) about the System 350 Micropinhole Collimator.

name

address

phone

# Early warning or false alarm?



In cases of vaginal bleeding in early pregnancy it is frequently impossible on clinical grounds alone to distinguish between those patients who will abort and those who will proceed to term.

It has been shown that the assay of human placental lactogen (HPL) in maternal serum can often make this distinction.<sup>(1)</sup> Patients with lower than normal levels usually went on to abort during their first admission, whereas those with normal levels were likely to continue successfully to term. Thus, the HPL assay "can indicate those women in whom abortion is inevitable and could be used

to reduce substantially the length of hospital stay in this common complication of early pregnancy."<sup>(1)</sup>

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

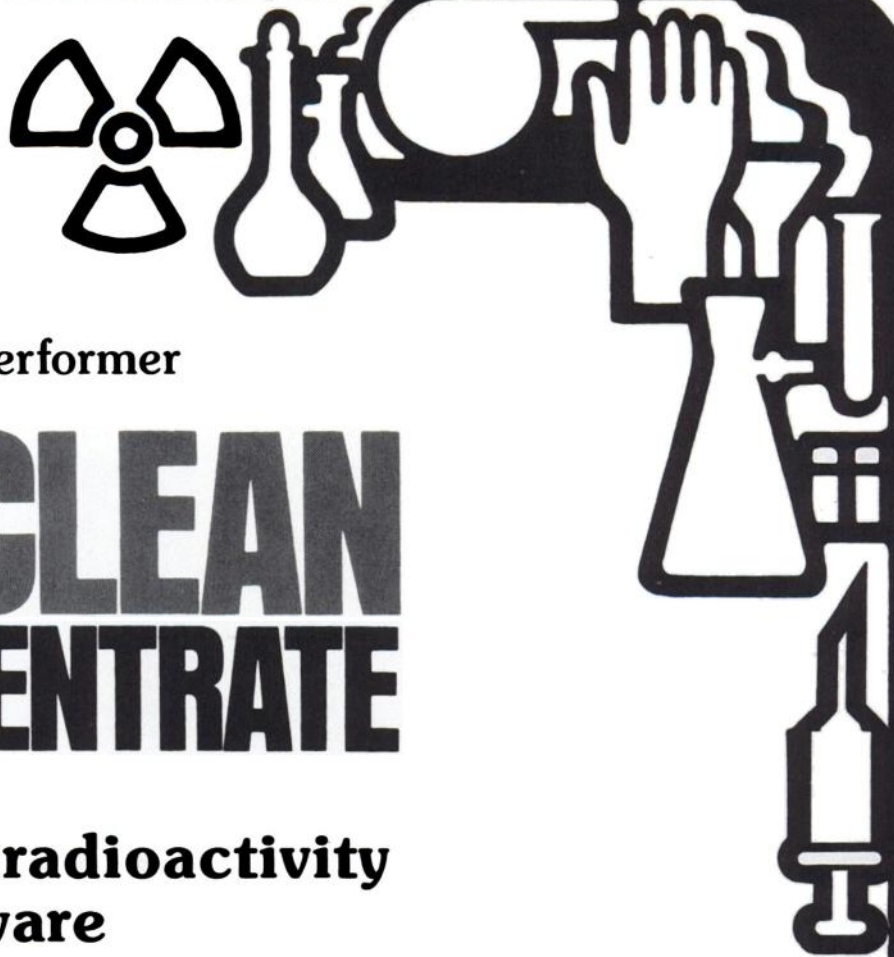
## Human Placental Lactogen a rapid, reliable test of placental function

- \* no 24-hour collection of urine
  - \* serial estimations easily performed
  - \* no risk to either patient or foetus
- Now available in kit form: HPL Immunoassay Kit (IM.68)



**The Radiochemical Centre  
Amersham**

The Radiochemical Centre Limited, Amersham, England.  
In the Americas: Amersham/Searle Corp., Illinois 60005. Tel: 312-593-6300  
In W Germany: Amersham Buchler GmbH & Co KG, Braunschweig



The Proven Performer

# ISOCLEAN CONCENTRATE

**Removes radioactivity  
from labware  
and isotope  
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A liquid radio-decontamination agent of highest efficiency, specifically formulated for the safe removal of nuclidic radioactivity from all types of laboratory ware and surfaces.

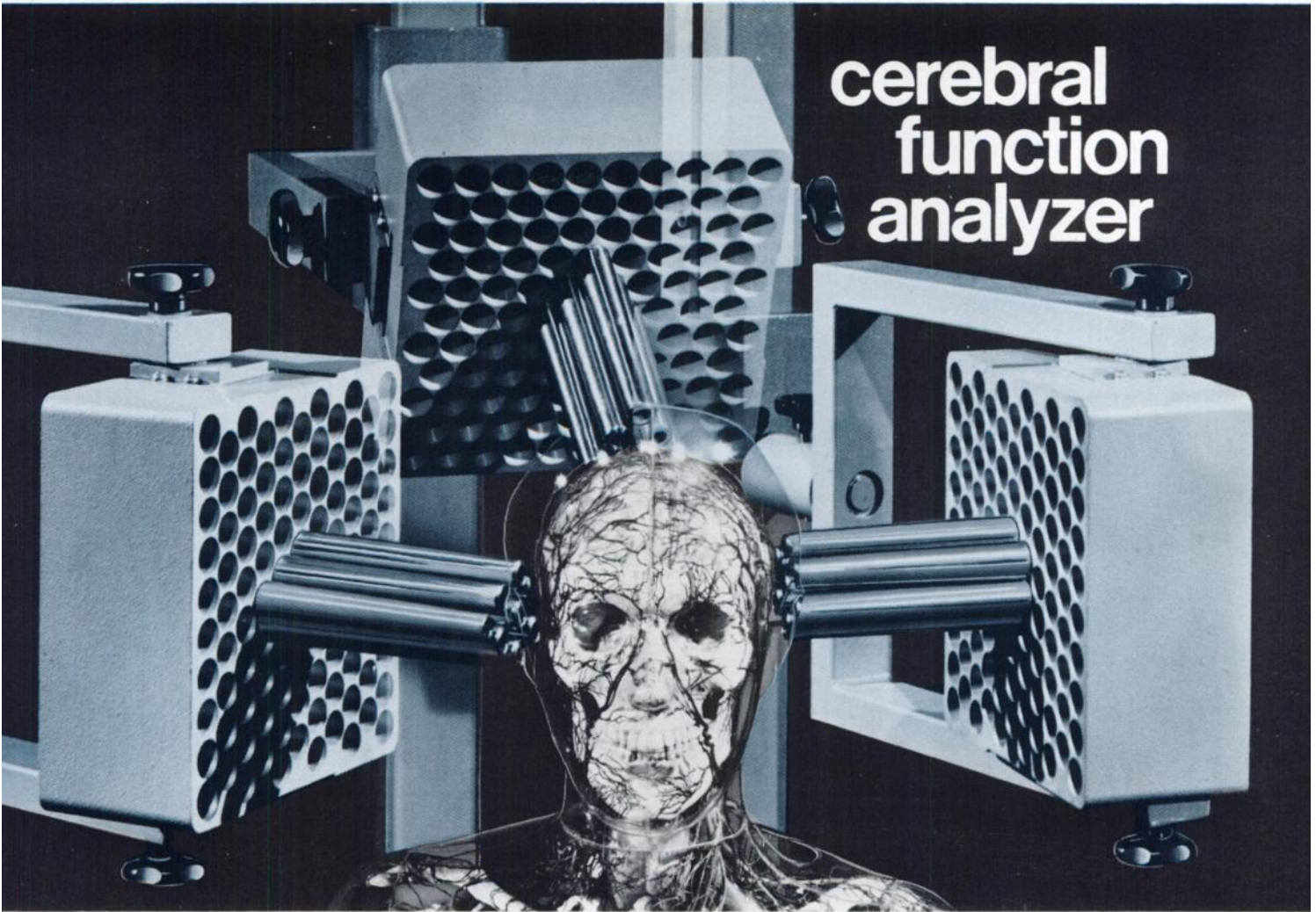
Isoclean Concentrate proves itself in use thousands of times daily as the most effective solution for cleansing hot-lab apparatus in clinical and research laboratories throughout the world.

Request informational brochure.

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# cerebral function analyzer

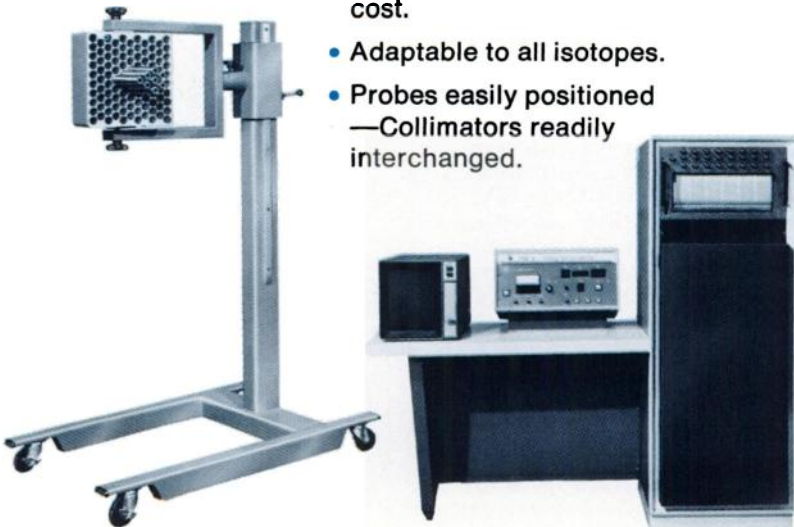


*Harshaw's TASC-5 multi-probe system is a new clinical research instrument for the acquisition of quantitative data on regional alterations of cerebral blood flow utilizing Xenon-133.*

TASC-5 offers the clinical investigator these advantages—

- True modular design allows system expansion at any time and at minimum cost.
- Adaptable to all isotopes.
- Probes easily positioned—Collimators readily interchanged.
- Minimum probe diameter allows maximum number of probes over area of interest.
- Stabilization circuitry maintains probe sensitivity.
- Provisions for both analog and/or digital data handling.

Our new 8-page brochure discusses TASC-5 in detail. Write or call us for a fast reply.



## HARSHAW

THE HARSHAW CHEMICAL COMPANY  
Division of Kewanee Oil Company  
Crystal & Electronic Products Department  
6801 Cochran Road • Solon, Ohio 44139  
(216) 248-7400



# **M.D.S. Introduces P.A.D. THE BEGINNING. Not the End.**

**\$29,900**

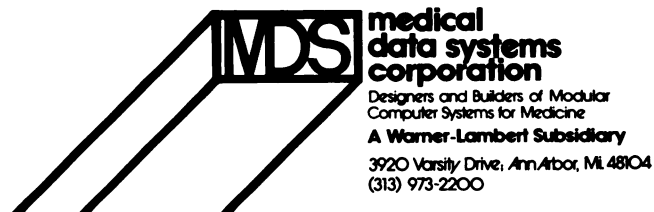
**You know your Nuclear Medicine department will expand. You want to accommodate future growth. And you need the best information processing system: The State of the Art.**

**In the past, when you've had to consider the limitations of price, you've had to mortgage the future because hard-wired systems can't be upgraded.**

**Medical Data Systems proudly announces P.A.D.: a portable Processor for Acquisition and Display. It's the new starting point for MODUMED, the State of the Art System. It interfaces to any gamma camera.**

**P.A.D. is software-based, disk-oriented, and priced very competitively. P.A.D. offers you more in performance and processing capabilities: for example, a high-speed movie-type display for dynamic studies, and a curve math program that provides immediate analysis.**

**But price and performance are only two of the many reasons you should consider P.A.D. A more important reason is the future. P.A.D. is expandable to all the other State of the Art modules: BASIC, DUAL, SIMULTANEITY, and TRINARY. In other words, there are no limitations in accommodating your future growth. P.A.D. is the beginning.**



# Dependable Radiopharmaceuticals for Scanning and Imaging



- $^{99m}\text{Tc}$  DIPHOSPHONATE-TIN
- $^{99m}\text{Tc}$  POLYPHOSPHATE-TIN
- $^{99m}\text{Tc}$  PHYTATE
- $^{99m}\text{Tc}$  DTPA-TIN
- Gallium-67 CITRATE
- Indium-111 DTPA
- Indium-111 CHLORIDE
- Xenon-133 IN SALINE
- Xenon-133 IN GAS PHASE

◀ *This is our Sodium Diphosphonate Kit which is useful for bone imaging. The kit is available from stock for immediate shipment. It has a long shelf life and is simple to prepare.*

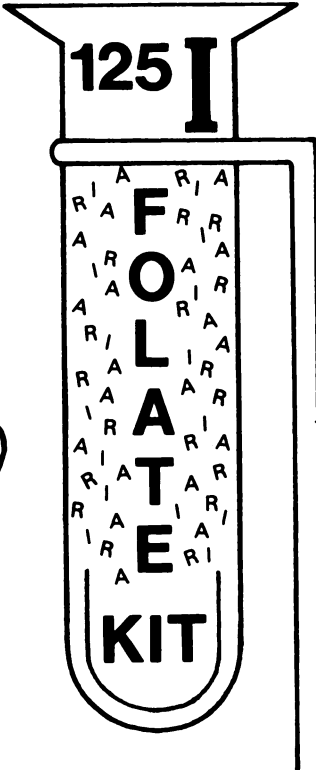


**diagnostic isotopes incorporated**

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RIA Products Inc.  
the world leader in  
folate diagnostics

Folate controls  
available with  
each kit



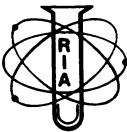
Expertise by re-  
known folate  
specialists

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fessionals!

- THE ENTIRE PROCEDURE IN FIVE EASY STEPS:**
1. Add buffer
  2. Pipet standards/patients serum & tracer
  3. Add binder & incubate for 30 min. at room Temp.
  4. Add dextran coated charcoal & Centrifuge
  5. Decant & count in gamma counter

**AVAILABLE IMMEDIATELY**

- (1)  $^{125}\text{I}$ -Folate Kit
- (2)  $^3\text{H}$ -Folate Kit
- (3) PGA-Specific Kit
- (4) Folate Control Serum



**RIA Products Inc.**

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Nobody can  
give you a perfect  
posterior whole body scan...  
but we're close.

## Two centimeters, to be exact.

The Searle Whole Body Scintiscan™ is an accessory which adds whole body bone-imaging capability to the widely used and accepted Pho/Gamma Scintillation Camera. Designed for operational simplicity and clinical safety, it can perform whole body and single organ studies with ease and accuracy. The patient-to-detector distance is less than 2 cm for posterior, "under the table" scans, allowing you to perform high resolution studies without re-positioning of seriously ill patients. A wide range of scan speeds and detector apertures lets you optimize total body information, assuring rapid data acquisition and high patient throughput.

For more information — including complete specifications — on the Scintiscan, just write or phone your Searle Representative. He'll be glad to show you how it can add whole body imaging capability to your facility with ease and economy never before possible.

**SEARLE**

**Searle Radiographics, Inc.**

Subsidiary of G. D. Searle & Co.  
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# REPRODUCIBLE, batch after batch.

Most everyone agrees that PYROPHOSPHATE is the best bone imaging agent. Unlike diphosphonate, it is a physiologically natural compound. Unlike polyphosphate, it is a fully identifiable compound that doesn't vary from batch to batch. Reliable bone imaging is achieved whether PYROPHOSPHATE is used today or years from now.

Far safer than strontium agents, our PYROPHOSPHATE is technetium labeled. It exhibits rapid urinary clearance, low blood levels and it isn't picked up by the liver or intestines. It exhibits 90% labeling compared to the 50% to 70% labeling of polyphosphate.

B. Bock, R. Perez, C. Panneciery and R. DiPaola *J. Nuclear Med.* 14, 380 (1973); R. M. Hopkins, J. M. Creighton and D. R. VanDeripe *Ibid* 409; F. Hosain, P. Hosain, H. N. Wagner, G. L. Dunson and J. S. Stevenson *Ibid* 410; R. Marty and J. D. Denney *Ibid* 423; M. R. McKamey, E. J. Artis and D. D. Hansen *Ibid* 426.

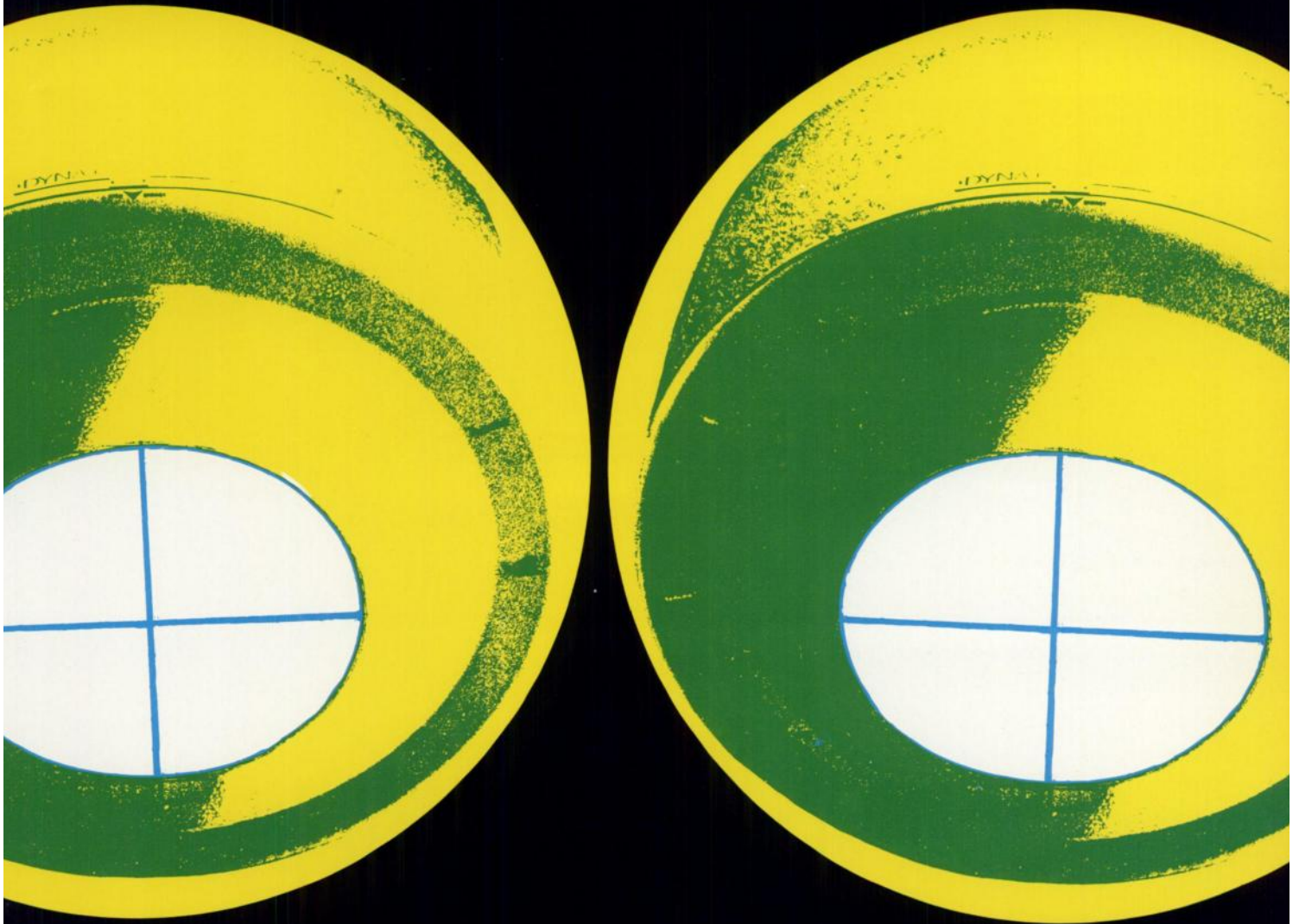


Write or call for full information. Our PYROPHOSPHATE is comparably priced with polyphosphate and diphosphonate.



**CIS Radiopharmaceuticals, Inc.**  
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Tel. (617) 275-7120

# THE DYNAMIC DUO



**PICKER**<sup>®</sup>  
ONE OF THE C.I.T. COMPANIES

# PICKER'S TWO NEW DYNA CAMERA SYSTEMS ARE DESIGNED TO GIVE YOU THE FINEST GAMMA SCINTILLATION IMAGES EVER PRODUCED.



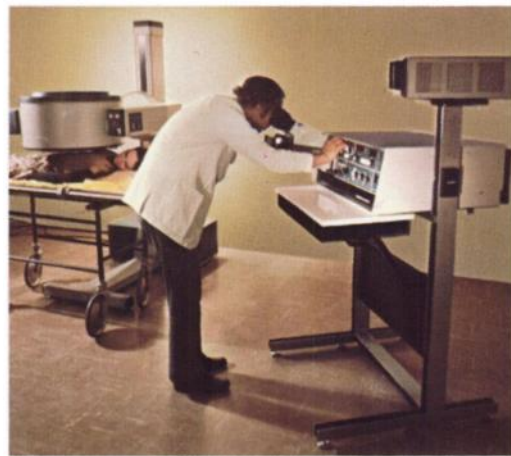
Dyna Camera 3C and Dyna Camera 4 are Picker's two new breakthrough developments in Anger-type scintillation cameras. They combine improved resolution with functional versatility as no other scintillation cameras can. And only Picker offers choice of detectors.

- For the smaller hospital—Dyna Camera 4 (analog only).

- For the medium-sized hospital—Dyna Camera 3C (analog/digital capability) with tape deck and Omni-view™.
- For medical centers and teaching hospitals—Dyna Camera 4 (analog/digital capability with the Gamma 11 data analysis system). But the real virtuosity of Picker's Dynamic Duo

becomes apparent with special-purpose applications:

- Cardiology
  - Endocrinology
  - Neurology
  - Hepatology
  - Pulmonary Studies
  - Metastatic Bone Studies
- For electronic sophistication, high resolution quality and



maximum versatility, Picker's Dyna Camera 3C and Dyna Camera 4 are outstanding. We've got the right combination to satisfy your gamma imaging needs now—and way into the foreseeable future. For full details, contact your local Picker office, or Picker Corporation, 595 Miner Road, Cleveland, OH 44143.

Picker's latest scintillation camera design, the Dyna Camera 4 (above, left), provides excellent resolution, combined with a high degree of flexibility.

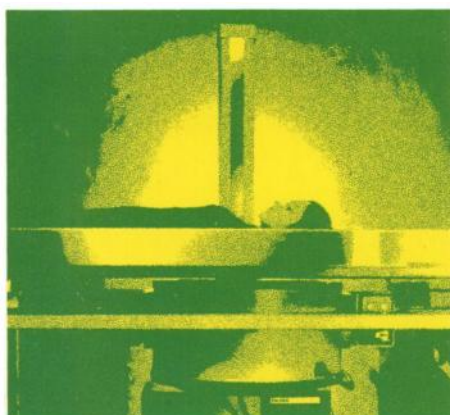
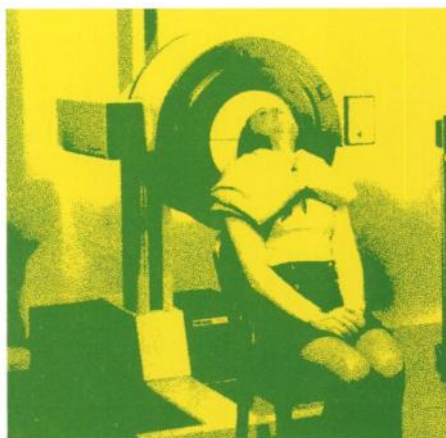
Picker Dyna Camera 3C, shown (top, right) with Omniview table for whole-body imaging, provides even better resolution than the widely used Dyna Camera 2C.

The new Dyna Camera 3C control (center, right) features advanced state-of-the-art electronics for better imaging and much greater versatility.

User designed to provide complete control of all functions for optimum gamma imaging results for greater patient throughput.

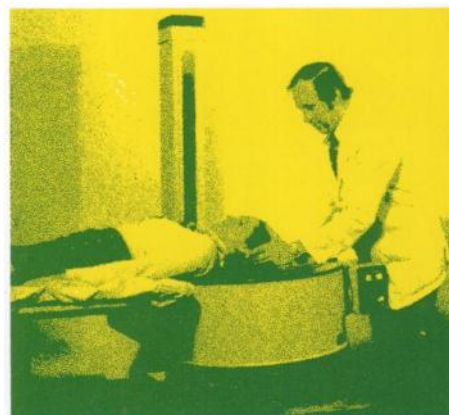
## Dyna Camera 3C

- Large imaging area views any organ completely, including both lungs, both kidneys or an enlarged liver and spleen.
  - New high-resolution detector produces clear diagnostic images for accurate lesion perception.
  - Excellent uniformity throughout the entire image area eliminates the possibility of instrument artifacts producing false positive readings.
  - High-speed buffer circuits combined with efficient collimators provide the fastest imaging possible for minimum patient discomfort and high patient throughput.
  - Choice of analog or precise digital imaging of organs may be selected with controlled gray scale smoothing of the digital display to best portray the organ.
  - Calibrated dual regions of interest for delineating and integrating dynamic function data in any selected areas of clinical interest.
  - Digital count integration for on-line analysis and quantitation of regions of interest organ profiles, and dynamic function histograms.
  - Exposures are controlled by exclusive preset information density for highest quality scintigrams each and every exposure.
  - Simplified patient positioning. Large field and built-in storage scope allows technician to easily and exactly position the patient.
- All above are standard built-in and exclusive features, not add-on extra-cost options. Dyna Camera's completely integrated system design means lowest overall cost, greatest operating convenience, and highest gamma imaging flexibility.**

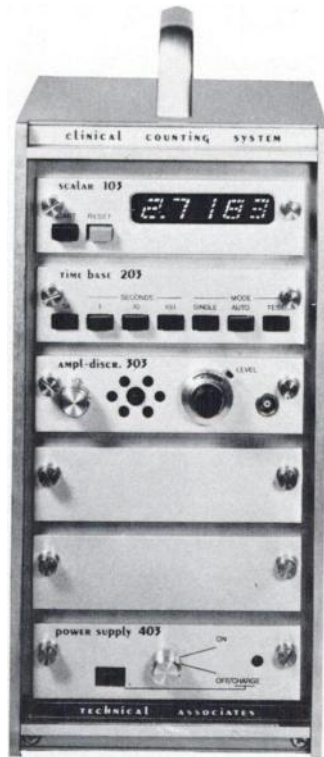


## Dyna Camera 4

- High-resolution images, a result of advanced detector techniques producing a clear, sharp diagnostic gamma-image presentation.
  - High-speed ultra-low dead time using analog buffering and delay line techniques.
  - Exposure-brightness computer for best exposures every time.
  - Basic camera at a basic camera price yet includes many unique Dyna Camera features.
  - Preset information density statistical control for quality data.
  - Joystick control of the calibrated region of interest for count density quantitation of normal vs abnormal areas of the patient's organs.
  - Choice of detectors designed to meet general purpose or specialized diagnostic needs.
  - Excellent uniformity utilizing Picker's patented variable-density thin-light-pipe design.
  - Built-in patient anatomical landmarking system.
  - Patient identification on every film.
  - Joystick control for hot-area or standard-area calibration, the heart of the information-density controller.
  - Built-in detector PM-tube-balancing circuitry.
  - Wide choice of clinical application collimators with Picker quick-change self-alignment feature.
  - Completely user designed to automate quality clinical imaging. Hidden panel for the lesser used controls.
- For complete details, including information on full line of accessories for Dyna Camera 3C and Dyna Camera 4, contact your local Picker office, or Picker Corporation, 595 Miner Road, Cleveland, OH 44143.**



# the proven clinical counting system



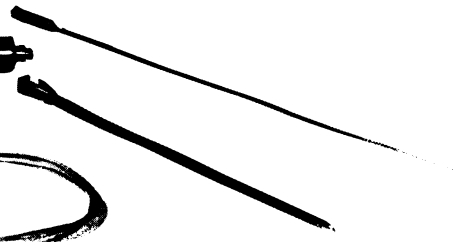
eye



catheter



implantable



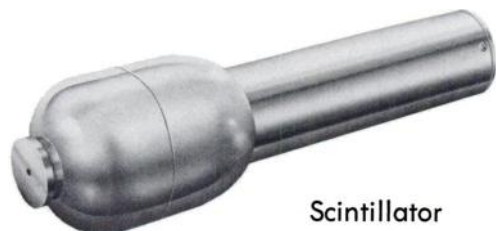
straight

needle

## Solid State Probes



G.I.



Scintillator

- Operating room design
- In vivo use
- Single, dual and multiple or matrix detectors
- Intracavitary, intraorgan, or surface
- Real time information
- Chart, printer, and computer compatible



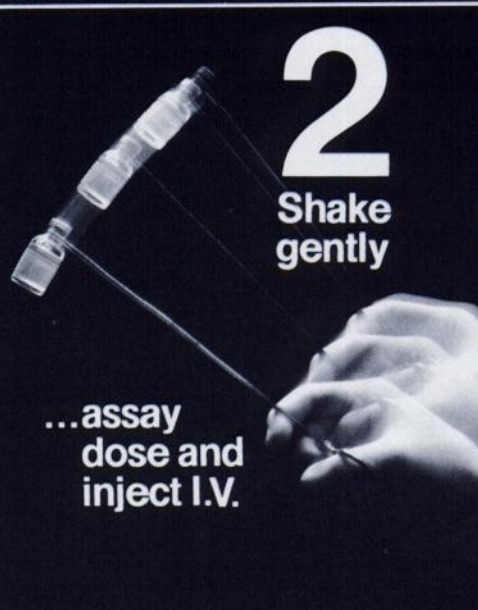
**TECHNICAL ASSOCIATES**

7051 ETON AVE., CANOGA PARK, CA. 91303  
(213) 883-7043

# 2 BASIC STEPS\* TO PREPARE FOR LUNG IMAGING



**1** Add  
sterile sodium  
pertechnetate  
 $^{99m}\text{Tc}$



**2**  
Shake  
gently

...assay  
dose and  
inject I.V.

\*Appropriate shielding  
should be maintained  
at all times.



Introducing from Squibb

# Macrotec®

## Aggregated Albumin (Human)

for labeling with technetium-99m

**Simplest and quickest to prepare** of three technetium-labeled lung imaging agents. No waiting, heating or involved routines.

**Stable for 8 hours after labeling if stored between 2° C. and 8° C.** Won't agglomerate in the vial; loses virtually no labeling while standing. No need to resuspend or rewash after standing. Just shake gently again and inject the next patient.

**Uniform particle size for good imaging.** Over 90% of particles in the range of 10-100 microns. Lung clearance half time about four hours. High labeling efficiency, high lung/liver ratio.

COMPARISON OF BASIC STEPS IN PREPARATION OF THREE TECHNETIUM-LABELED LUNG IMAGING AGENTS*		
MACROTEC® Aggregated Albumin (Human)	Albumin Microspheres (human)	Other competing brand aggregated albumin (human)
1. Add $^{99m}\text{TcO}_4^-$ to product vial	Add $^{99m}\text{TcO}_4^-$ to product vial	Shake ampul, open and withdraw aggregate
2. Shake gently	Agitate in boiling water	Introduce product to reaction vial
3.	Withdraw supernatant and discard	Add $^{99m}\text{TcO}_4^-$ to reaction vial
4.	Add rinsing/suspending solution to reaction vial	Shake thoroughly
5.	Agitate ultrasonically	

\*Based on manufacturers' product information.

### Macrotec® Aggregated Albumin (Human)

#### BRIEF SUMMARY

Macrotec (Aggregated Albumin [Human]) is a sterile, non-pyrogenic, lyophilized preparation of aggregated albumin. Each vial of the preparation contains 0.08 mg. tin as chloride, 1.5 mg. denatured human serum albumin, and 10 mg. Normal Serum Albumin (Human).

**INDICATIONS:** For use in perfusion lung imaging as an adjunct to other diagnostic procedures.

**CONTRAINDICATIONS:** At present there are no known contraindications to the use of this product.

**WARNINGS:** Radiopharmaceuticals should not be administered to patients who are pregnant, or during lactation, unless the benefits to be gained outweigh the potential hazards.

Ideally, examinations using radiopharmaceuti-

als, 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.

Since  $^{99m}\text{Tc}$  is excreted in milk during lactation, formula-feedings should be substituted for breast-feedings.

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.

*Note:* Macrotec (Aggregated Albumin [Human]) is not radioactive. However, after  $^{99m}\text{Tc}$  is added adequate shielding of the resultant preparation should be maintained.

**PRECAUTIONS:** In the use of any 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.

Aseptic technique is essential in the preparation of Technetated ( $\text{Tc-}^{99m}$ ) Aggregated Albumin (Human).

**ADVERSE REACTIONS:** At present, adverse reactions have not been reported following the administration of this product.

For full prescribing information, consult package insert.

**HOW SUPPLIED:** In boxes of 5 vials.

Medotopes®



**SQUIBB HOSPITAL DIVISION**  
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Princeton, N J 08540

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# WIDE FIELD CAMERA

**Field of View.** The useful field is a hexagon that is 14.5" (36.8cm.) across the flats.

**Resolution.** With the high resolution low energy collimator installed, 5/32" (4.0mm) Pb bars separated by 5/32" (4.0mm) spaces can be resolved using  $^{99m}\text{Tc}$ .

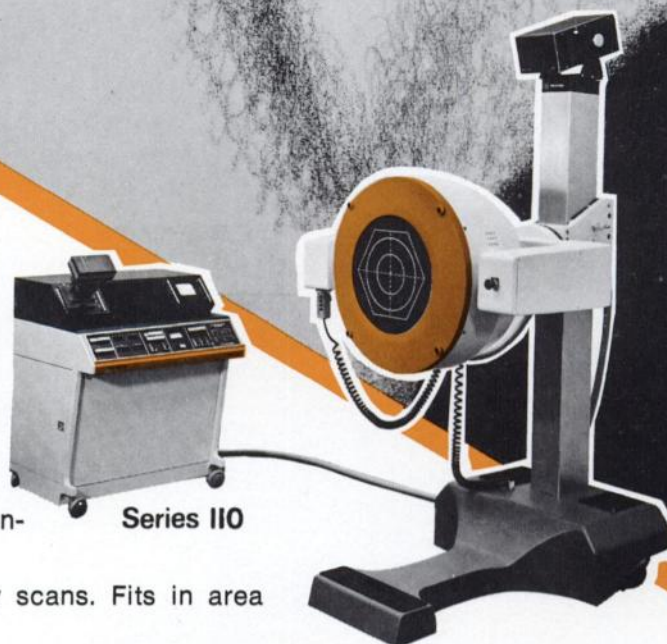
**Speed.** Maximum output count rate of 100K counts/sec. Performs standard studies more rapidly. Helps make fast dynamic studies a standard practice.

**Ease of Operation.** 14.5" field of view eliminates need for frequent collimator changes. Fast set-up with two speed-conventional and express-detector motion. Manual or pushbutton isotope selection. Entire study conducted from hand control without leaving patient's side.

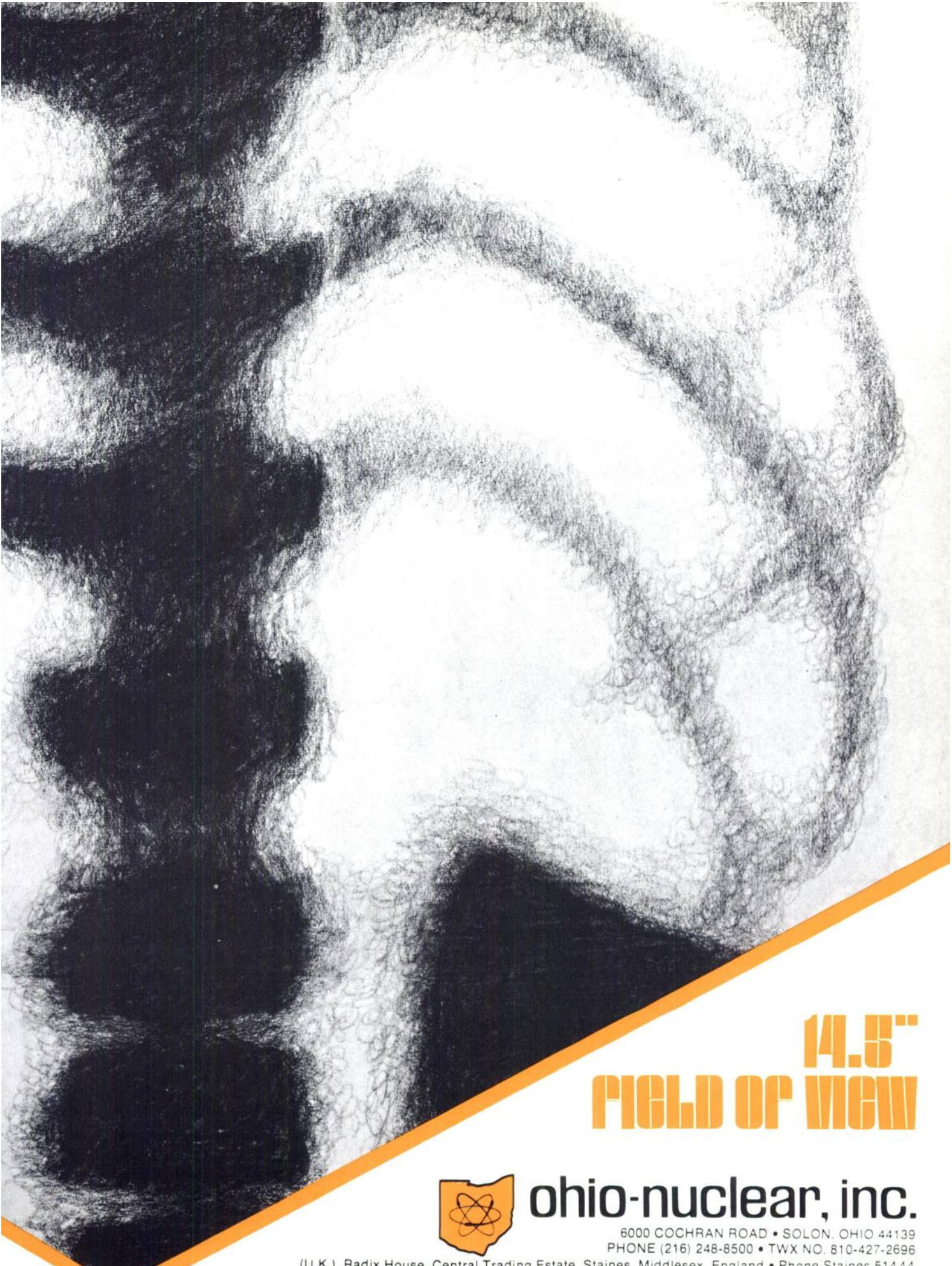
**Area Scan.** Permits rapid trunk and whole body scans. Fits in area 10' x 10' (3.05m.)

**Economy.** Reduced set up time. Reduced study time. Photomultiplier tube gains balanced by your technologist, eliminating need for serviceman.

**Want Proof?** Send for our Series 110 Radioisotope Camera brochure, and our Systems Resolution product bulletin. Visit an installation... we'll arrange it. And talk to us. We have something better. The Superior Wide Field Radioisotope Camera. From Ohio-Nuclear.



Series 110



**14.5"**  
**FIELD OF VIEW**



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# CEA-ROCHE

## *Carcinoembryonic Antigen assay*

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

### 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.<sup>1-6</sup> Serial determinations of CEA proved to be of value in assessing the condition of the patient during therapy.<sup>2-5,7</sup>

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.<sup>8,9</sup> Except for primary pancreatic and colorectal carcinoma, titers above 20 ng/ml were, with very rare exceptions, associated with the presence of metastatic disease.<sup>9</sup> 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

When used as an adjunct to other tests and procedures, the CEA-ROCHE assay has provided supplemental information that was of value in assessing whether or not malignancy was present:

- in patients who had signs, symptoms and clinical history suggestive of cancer,
- in patients similar to the above who, also, had certain chronic gastrointestinal and pulmonary inflammatory diseases in which the risk of cancer is greater than in the corresponding normal population,
- in patients who were heavy cigarette smokers and had atypical sputum cytology.

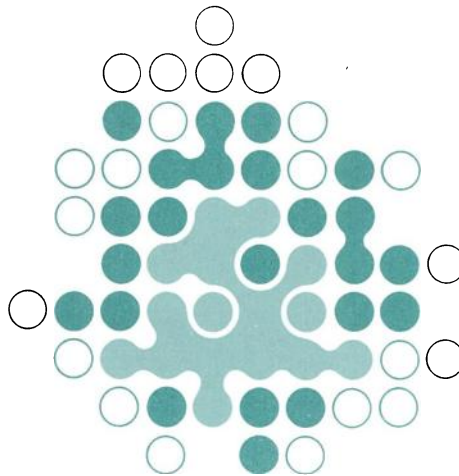
These nonmalignant inflammatory diseases in their active state may give rise to CEA titers above 2.5 ng/ml. These titers usually drop below 2.5 ng/ml when these diseases are in remission.<sup>6,9-11</sup>

In a special study of 883 patients, cigarette smoking with titer elevations were associated with atypical sputum cytology.<sup>12</sup> Decreases in CEA titer often occurred within 30 to 60 days after cessation of smoking.

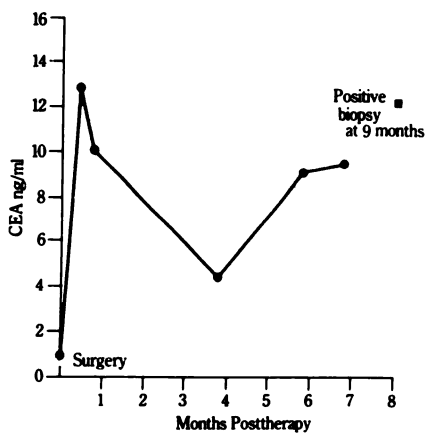
It must be stressed that test results and data arrived at using the CEA-ROCHE assay cannot be compared with results obtained by any other method or reagents.

### 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.**



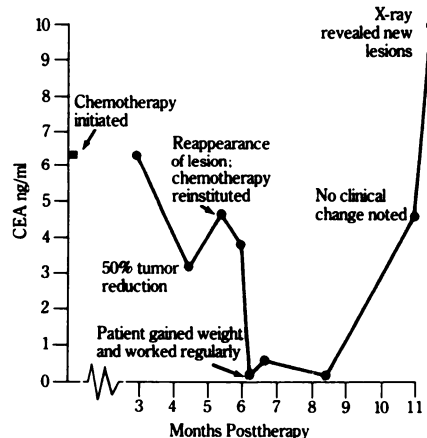
**representative case  
history of patient being  
treated for malignancy  
without known  
metastases**



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 reinstated 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.

### references

1. Dhar P, et al: *JAMA* 221:31-35, 1972
2. Holyoke ED, et al: *Ann Surg* 176:559-564, 1972
3. Reynoso G, et al: *JAMA* 220:361-365, 1972
4. Vincent R, Chu TM: *J Thorac Cardiovasc Surg* 66:320-328, 1973
5. Zamcheck N, et al: *New Eng J Med* 286:83-86, 1972
6. Gold P, et al: *Dis Colon Rectum*, In Press
7. Sorokin J, et al: *Gastroenterology* 64:894, 1973
8. Holyoke ED, et al: *Rev Surg* 30:305-311, 1973
9. Data available on request from Hoffmann-La Roche Inc, Nutley NJ
10. Rule A, et al: *New Eng J Med* 287:24-26, 1972
11. Moore TL, et al: *JAMA* 222:944-947, 1972
12. Hansen HJ, et al: *Human Pathology*, In Press

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

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

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

Dr. \_\_\_\_\_

Address \_\_\_\_\_

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

K-1



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Roche Clinical Laboratories, Inc.  
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CA-6K

# Introducing the lung imaging agent for pulmonary scintigraphy that needs no introduction



# Lungaggregate™ Reagent

## Aggregated Albumin (Human)

For over two years Medi + Physics has been conducting clinical trials on Lungaggregate™ Reagent. The manufacturing process and the resulting product are time-tested and dependable.

Excellence of imaging quality has been confirmed by clinical studies in more than 4,000 patients. There were no reported adverse reactions. See the last page for full product information which lists all indications, contraindications, warnings, precautions, adverse reactions, dosage, and administration in the use of this material.

Lungaggregate™ Reagent tagging efficiency is consistent, and consistently high—over 90%. There is virtually no label loss for 24 hours.

As for uniformity of size, over 90% of the particles have a mean diameter of 10 to 90 microns; less than 1% have a mean diameter over 100 microns; and none have been observed greater than 150 microns.

Preparing Lungaggregate™ Reagent is simply and quickly done—it is an aqueous suspension.

### **One lung imaging agent offers all of these advantages:**

**Imaging excellence**

**Soft albumin particles with rapid lung clearance—4.77 hours  
biological half-time**

**High tagging efficiency—greater than 90%**

**Compatibility with most sources of oxidant-free Tc 99m  
sodium pertechnetate solutions**

**Controlled particle size—90% are within the 10 to 90-micron range**

**Clinical proof—over 4,000 patient studies**

**Simplicity and speed of preparation**

**Six-month shelf life**

**Available from nine Medi + Physics regional  
distribution centers**

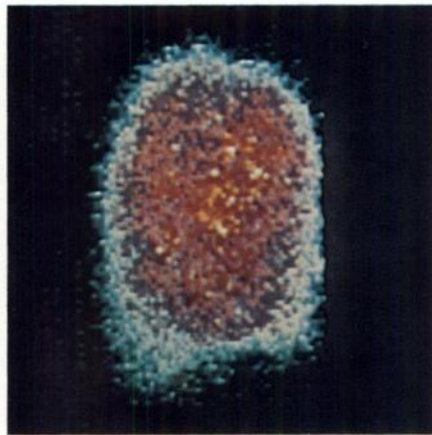




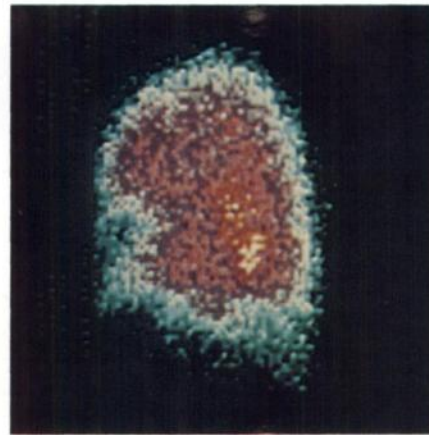
Anterior



Posterior



Right Lateral



Left Lateral

**Lung images demonstrating a perfusion defect after intravenous injection of 3.5 mCi of technetated (Tc 99m) aggregated albumin (human).**

Counts collected—413,000 to 419,000 per view.

Lung imaging time—160 seconds on posterior and lateral views, 208 seconds on anterior view.

(Complete data are available on request from Medi+Physics)



# Lungaggregate™ Reagent

## Aggregated Albumin (Human)

### 1. Name:

Aggregated Albumin (Human) for Intravenous Injection after Labeling with Sodium Pertechnetate Tc 99m. Lungaggregate™ Reagent.

### 2. Description and Ingredients:

Lungaggregate™ Reagent is prepared from albumin from human plasma nonreactive when tested for hepatitis associated (Australia) antigen (less than 1.0 mg of human serum albumin per ml), stannous chloride (less than 0.38 mg/ml) in phosphate buffered sodium chloride solution at pH 5.0 to 6.0, and 2% benzyl alcohol added as a preservative. Each lot of Lungaggregate™ Reagent meets the following specifications prior to release.

2.1 Size distribution—over 90% of the counted particles have a mean diameter of 10-90  $\mu\text{m}$ , less than 1% have a mean diameter over 100  $\mu\text{m}$  and no particles observed have a mean diameter greater than 150  $\mu\text{m}$ .

2.2 Particle density—300,000 to 600,000/ml

2.3 Apyrogenic

2.4 Sterile

2.5 pH—5.0 to 6.0

2.6 Passes general safety test

2.7 Labeling and distribution: Labeled product meets the following criteria:

- (a) Less than 10% of activity is free pertechnetate;
- (b) Over 80% of injected activity is in lungs, and the lungs to liver and spleen activity ratio is greater than 10/1 at 3 to 5 minutes after intravenous administration in rats.

### 3. Method of Preparation:

(NOTE) Aseptic technique must be used in the following preparation to minimize the possibility of contamination with micro-organisms.)

3.1 Record on the mixing vial label, shield label, and record labels the time and date of preparation, the volume of Lungaggregate™ Reagent and Tc 99m volume, activity, and calibration time to be added to the mixing vial.

3.2 Shake the aggregate ampul vigorously to suspend particles.

3.3 Open the ampul.

3.4 Withdraw (very slowly) 1.5 to 2.0 ml of aggregate from the ampul using a syringe with an 18 to 21 gauge needle.

3.5 Inject (very slowly) the syringe contents into the mixing vial.

3.6 Wrap the mixing vial in an absorbent paper disc and place it in the lead shield. Place the completed shield label on the lead shield.

3.7 Add 0.5 to 2.0 ml of oxidant-free Tc 99m-pertechnetate in saline into the shielded mixing vial, shake vigorously for at least 30 seconds, and incubate contents at room temperature for 30 minutes. (The total amounts of Reagent and Tc 99m-pertechnetate solutions added must be less than 3.5 ml since this is the maximum capacity of the mixing vial. Moreover, the total Tc 99m activity used must be such that at the time of use of the product the patient dose consisting of 1 to 4 mCi activity must contain 0.1 to 1.5 ml of Reagent.) Use of Sodium Pertechnetate Tc 99m having a maximum specific concentration of 25 mCi/ml is recommended.

3.8 Retain record label as documentation for completed preparation procedure.

### 4. Actions (Clinical Pharmacology):

When macroaggregated human serum albumin (particle size greater than 10  $\mu\text{m}$ ) is injected intravascularly, it lodges in the first arteriolar-capillary bed it reaches, and the relative distribution of the macroaggregates is a measure of the relative blood flow to these vascular beds. If a particular vascular bed is occluded, as is seen in the lung following pulmonary embolization, then the tissue having a compromised blood supply fails to show accumulation of radiolotope in contrast to surrounding normally perfused tissue. Radiolotopically labeled macroaggregated albumin has thus proven useful in evaluating perfusion of the lungs and to a lesser extent other organs in which the aggregates may be introduced into their afferent blood supply.

### 5. Indications:

Imaging of regional pulmonary perfusion in the presence of clinically suspected regional pulmonary ischemia, such as is seen with pulmonary emboli, neoplasms and obstructive lung disease.

### 6. Contraindications:

The presence of large right to left cardiovascular shunts which could allow intravenously administered macroaggregates to directly enter the systemic circulation is a contraindication for the use of macroaggregates. Particulate material such as macroaggregated albumin should not be administered to patients with cyanosis or with evidence of severe restriction to pulmonary blood flow such as may be present in pulmonary hypertension of various etiologies. This agent should not be administered to pregnant or lactating women, or to patients under eighteen years of age unless the expected benefits to be gained from the study are critically judged to outweigh the risks involved.

### 7. Warnings:

Whenever protein-containing materials such as Tc 99m labeled Lungaggregate™ are administered to man, especially when administered repeatedly, there is a possibility that hypersensitivity reactions may occur. Epinephrine, antihistamines and corticosteroid drugs should be readily available whenever this product is administered.

### 8. Precautions:

The precautions associated with the use of Tc 99m labeled Lungaggregate™ are thought to be the same as those associated with the use of radioactive material with similar physical and chemical properties. Appropriate procedures should be used to minimize exposure to the patient and all attending personnel. Thus, the dose of the Tc 99m labeled Lungaggregate™ used in a given patient should be the minimum necessary to achieve useful information for the clinically indicated study and for the kind of radiation detection devices employed. To insure the integrity of the labeled soft macroaggregate of this agent, it is emphasized that needles of 18 to 21 gauge should be used for preparing or administering this diagnostic agent. The injection should be made slowly to prevent disruption of the aggregates. In any case, once the preparation is withdrawn from the vial it should be administered promptly to avoid settling and clumping of the aggregate particles. One should also avoid aspirating blood and tissue fluids into the syringe in a manner which could promote the formation of small clots. Some users have successfully circumvented this latter situation by infusing a small amount of sterile saline intravenously and then giving the Tc 99m-Lungaggregate™ preparation through the patent I.V. needle. On the other hand, one should not use an ongoing intravenous infusion as a portal for administering this agent because of the well known tendency of fibrin accumulations in and about such intravascularly placed devices. Only authorized physicians and personnel who have adequate training in the proper use and safe handling and disposal of radiopharmaceuticals should use this product.

### 9. Adverse Reactions:

Although no adverse reactions attributable to the reagent were reported in approximately 4,000 reported patient studies using Tc 99m labeled Lungaggregate™ Reagent (see Section 12 Clinical Studies), and while no adverse reactions are anticipated relative to its use, one cannot completely discount the possibility of such an occurrence. Hypersensitivity to the agent and intolerance to any degree of particle-induced pulmonary capillary blockade may possibly result in adverse reactions. Fatal reactions have been reported following administration of other preparations of macroaggregated human serum albumins (1, 2, 3).

### 10. Dosage and Administration Procedure:

10.1 Administer 1 to 4 mCi of Tc 99m labeled macroaggregated albumin in a volume containing no less than 0.1 ml and no more than 1.5 ml of the Lungaggregate™ Reagent to a patient in a single study.

10.2 Prepare patient for the study and for intravenous injection before withdrawing dose from the mixing vial.

10.3 Shake contents of the mixing vial vigorously just before removing aliquot intended for patient use.

10.4 Withdraw (very slowly) the calculated dosage and volume from vial into a syringe using an 18 to 21 gauge needle.

10.5 Inject dose intravenously promptly after withdrawal from vial. Avoid drawing blood or tissue fluids into syringe in a manner which would enhance clotting.

10.6 Image immediately after I.V. injection.

10.7 Store remainder of preparation in the mixing vial under refrigeration (Do Not Freeze), protected from light. It may be used up to 24 hours after time of preparation. Discard after 24 hours from time of preparation.

10.8 Disposal methods must comply with prevailing drug and radioactive waste disposal regulations.

### 11. Radiation Dosimetry:

Based on human whole body in vivo distribution kinetics of intravenously administered Tc 99m labeled Lungaggregate™ described in Section 12, Dr. E. M. Smith\* calculated the radiation dose to various organs of a standard 70 Kg man using the absorbed fraction method. The results of these calculations follow.

Organ	Absorbed Dose in Rads	
	1 mCi Tc 99m Administered	4 mCi Tc 99m Administered
Liver	0.080	0.320
Lung	0.190	0.760
Spleen	0.060	0.240
Total Body	0.011	0.044
Ovaries	0.007	0.018
Red Marrow	0.011	0.044
Testes	0.004	0.016

\* Edward M. Smith, ScD., Miami, Florida

### 12. Clinical Studies:

Evaluation of in vivo distribution kinetics of Tc 99m activity following intravenous administration of Tc 99m labeled Lungaggregate™ to normal human subjects was performed by a quantitative evaluation of whole body scintillation scanning. The data was consistent with a kinetics model which identified 90% of the administered activity as initially localized in the lungs with a subsequent biological clearance half-time of 286 minutes or 4.77 hours; as activity cleared from the lungs, 30% of the administered activity eventually concentrated in the liver and spleen; all remaining activity had a whole body distribution pattern similar to that of pertechnetate ion. Mathematically stated, the model identifies the fractional distribution pattern of activity as follows: Lung =  $0.90e^{-t/286}$ , Liver and Spleen =  $0.30(1 - e^{-t/286})$ , Whole Body distribution similar to pertechnetate ion =  $0.10 + 0.60(1 - e^{-t/119})$  (where t = time in hours after administration of activity).

Clinical evaluation of Tc 99m labeled Lungaggregate™ Reagent in approximately 4,000 reported patients indicated that when prepared and used as directed, satisfactory imagings of pulmonary perfusion resulted. No adverse reactions have been observed that could be causally related to the administration of this agent.

### 13. Licensing:

Tc 99m labeled Lungaggregate™ Reagent may be used only by physicians licensed for such use. Such licensing should be obtained from the U.S. Atomic Energy Commission in AEC Regulated States and Federal medical facilities and from delegated state authorities in all other states.

### Footnote:

1 Wagner, H. N., Jr., Radiology, 91:1235, 1968.

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3 Vincent, William R., et al, Goldberg, S. J., Desilets, D., Radiology, 91:1181-1180, 1965.



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

Only the RADX Mark V dosecalibrator measures the activity of radionuclides from 1  $\mu\text{Ci}$  to 1000 mCi, then computes the exact volume needed for patient injection.

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

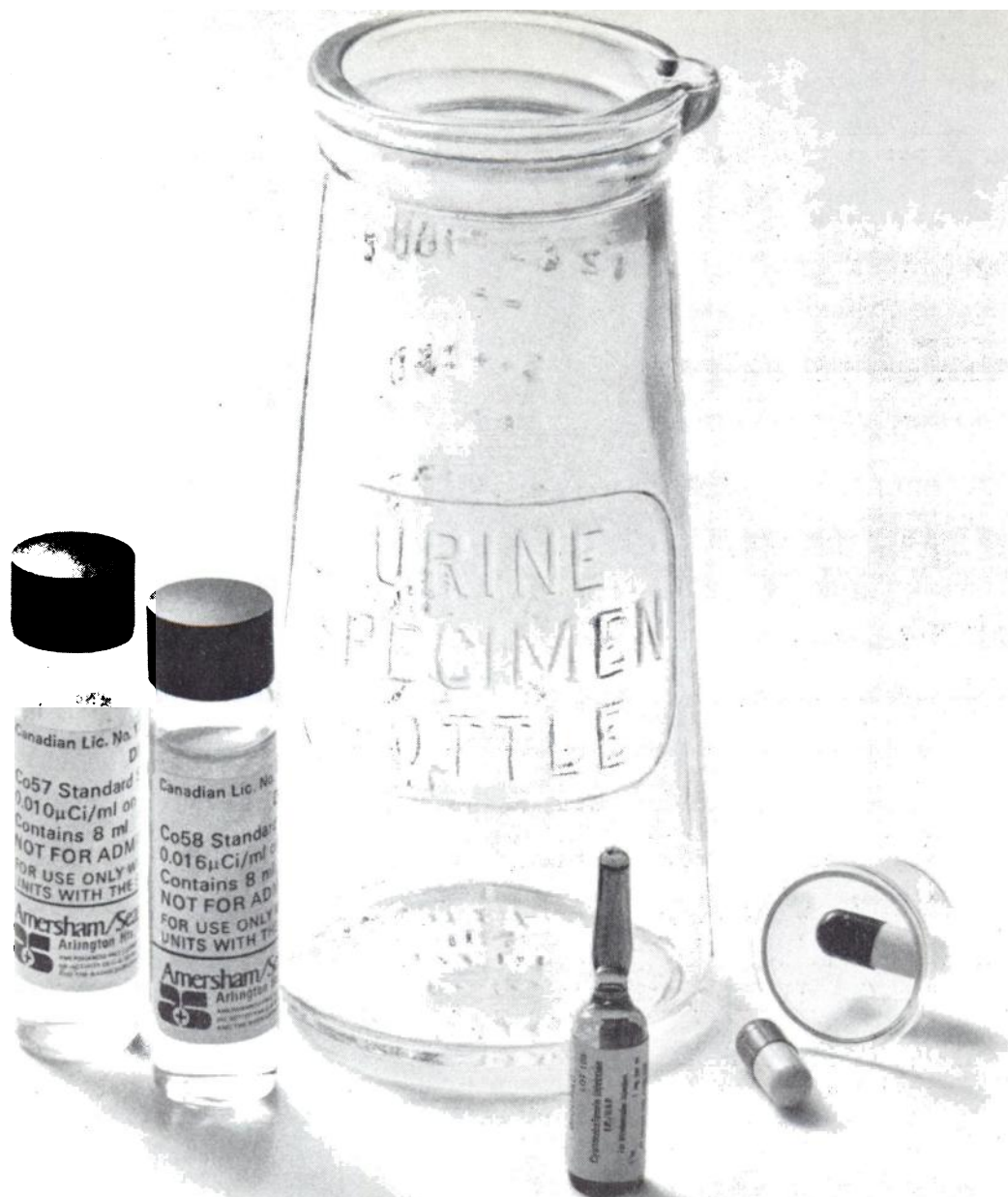
additional modules may be added at any time. Updating is simple and economical.

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

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

**RADX**  
CORP.

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## we've just made a good test easier.

Don't separate both parts of the Schilling test by three days. With Dicopac both parts are performed at the same time. The results are derived in less time, because the two labelled forms of vitamin B<sub>12</sub> (free cyanocobalamin Co-58 and cyanocobalamin Co-57 bound to [human] gastric juice) are administered simultaneously.

The results are expressed as a percentage of each nuclide excreted and, more importantly, as a ratio of Co-57 to Co-58. An incomplete urine collection will affect the absolute amounts of each nuclide collected, but not the ratio of Co-57 to Co-58. Therefore, the test is not necessarily invalidated by incomplete urine collection.

For convenience, the flushing dose of unlabelled vitamin B<sub>12</sub> (1 mg) is supplied in individual single dose ampules.

For more detailed information, please refer to the next page of this advertisement or contact our Customer Service Department.

Dicopac for diagnosis of vitamin B<sub>12</sub> malabsorption.

# Dicopac<sup>®</sup>

(0.25 µg cyanocobalamin  
gastric juice, 0.25 µg

Co-57 bound to [human]  
cyanocobalamin Co-58)

**DESCRIPTION:** Each Dicapac® Kit consists of five single-test cylinders, a vial of Cobalt 57 (Co 57) standard, and a vial of Cobalt 58 (Co 58) standard. Each test cylinder contains a capsule of cyanocobalamin Co 58 (vitamin B<sub>12</sub> Co 58), a capsule of cyanocobalamin Co 57 (vitamin B<sub>12</sub> Co 57) bound to human gastric juice, and an ampule of unlabelled cyanocobalamin for injection.

**ACTIONS:** Oral vitamin B<sub>12</sub> is normally coupled with intrinsic factor (IF) contained in the gastric juice secreted by the stomach and the vitamin B<sub>12</sub> combined with intrinsic factor is absorbed in the terminal ileum. Only intrinsic factor bound vitamin B<sub>12</sub> is absorbed by this route. Following parenteral administration or gastrointestinal absorption, cyanocobalamin is bound to plasma proteins and distributed to the liver and blood forming organs.

**INDICATIONS:** Dicapac Kit consisting of cyanocobalamin Co 58 and cyanocobalamin Co 57 combined with human intrinsic factor is used to assess vitamin B<sub>12</sub> absorption in the diagnosis of malabsorption due to the lack of intrinsic factor, e.g. Addisonian (pernicious) anemia, and as a diagnostic adjunct in other defects of intestinal absorption.

**CONTRAINDICATIONS**  
None

**WARNINGS:** This radiopharmaceutical should not be administered to patients who are pregnant or during lactation unless the information to be gained outweighs the potential hazards.

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

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

The test should not be started within 24 hours of a therapeutic dose (1000 µg) of vitamin B<sub>12</sub> or within 24 hours of a loading dose of vitamin B<sub>12</sub> given for the Schilling test.

If bone marrow examinations are to be done, they should precede the administration of this test, as the flushing parenteral dose of vitamin B<sub>12</sub> may alter the bone marrow picture.

**ADVERSE REACTIONS**  
None

**DOSAGE AND ADMINISTRATION:** One purple/white capsule containing 0.25 µg cyanocobalamin Co 57 (nominal activity 0.5 µCi at activity date) bound to human gastric juice for oral administration.

One red/ivory capsule containing 0.25 µg cyanocobalamin Co 58 (nominal activity 0.8 µCi at activity date) for oral administration.

One ampule of unlabelled cyanocobalamin (1 mg) for intramuscular injection.

The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration. Care must be taken when measuring the activity in the Co 57 and Co 58 capsules because of the small amount of radioactivity present.

**ADMINISTRATION AND TEST PROCEDURE\*:** The Dicapac test is performed in a manner similar to the Schilling test, however, with this test both Co 58 cyanocobalamin and Co 57 cyanocobalamin bound to intrinsic factor are administered simultaneously. Thus, both vitamin B<sub>12</sub> absorption and response to intrinsic factor are measured with the Dicapac test.

Both Dicapac capsules are orally administered to a fasting patient, who is instructed to collect all urine for the next 24 hours. An intramuscular injection of non-radioactive vitamin B<sub>12</sub> is administered to the patient up to two hours after the radioactive capsules are administered.

After the total volume of urine is measured, aliquots are taken for counting. The urine samples and the Co 57 and Co 58 standards provided with the Dicapac Kit are counted using dual isotope counting procedures. This data is used to calculate the percent excretion of each radionuclide and the ratio of the percent excretion of Co 57 to the percent excretion of Co 58.

\*Refer to "The Technical Information for the Performance of the Dicapac Test" brochure provided with the Dicapac Kit for further information on procedural techniques.

**INTERPRETATION OF RESULTS:** The usual percent excretion values and the ratios obtained with Dicapac are presented in Table I.

**Table I. Results of 24-hour urine excretions and Co 57/Co 58 ratios with Dicapac:**

Diagnosis	Mean values % (usual range)		Co 57/Co 58 ratio
	Co 57 + I.F.	Co 58	
Normals	18 (10-42)	18 (10-40)	0.7-1.3
Pernicious anemia and certain gastric lesions	9 (6-12)	3 (0-7)	>1.7
Malabsorption syndromes not caused by lack of I.F.	<6	<6	0.7-1.3

A small number of patients have been found to excrete a "normal" (i.e., >10%) amount of Co 58, but these individuals exhibit elevated ratios (>1.4). The clinical significance of these findings is presently unclear.

**PHYSICAL CHARACTERISTICS:** Cobalt-57 decays by electron capture with a physical half life of 270 days. The primary gamma energy of Co 57 is about 122 KeV. Cobalt-58 decays by electron capture and positron and gamma emissions with a physical half life of 71 days. The primary gamma energy of Co 58 is 811 KeV. Photons that are useful for counting are listed in Table I.<sup>1,2</sup>

**Table I. Principal Radiation Emission Data**

Radiation	Mean %/disintegration	Mean Energy	
		(KeV)	
Co 57	Gamma -2	87.1	121.9
	Gamma -3	9.8	136.3
Co 58	Beta -1	15.0	203.7
	Gamma -1	99.4	810.5
Annihilation Radiation	30.0		511.0

<sup>1</sup>Dillman, L.T., Radionuclide Decay Schemes and Nuclear Parameters for Use in Radiation-Dose Estimation, Supplement No. 2, MIRD pamphlet No. 4, J. Nucl. Med., p. 27, 1969.

<sup>2</sup>Dillman, L.T., Radionuclide Decay Schemes and Nuclear Parameters for Use in Radiation-Dose Estimation, part 2, Supplement No. 4, MIRD pamphlet No. 6, J. Nucl. Med., p. 16, 1970.

The specific gamma ray constant for Co 57 is 1.0 R/mCi-hr at 1 cm. For Co 58 it is 5.5 R/mCi-hr at 1 cm. The half value layer for Co 57 is 0.2mm of Pb. For Co 58 it is 9mm of Pb.

To correct for physical decay of these radionuclides, the fractions that remain at selected time intervals before and after the day of calibration are shown in Table II.

This table is not needed for routine calculation, as all counting is relative to the standards which have been prepared from the same batch of each of the radionuclides as the corresponding cyanocobalamin capsules.

**Table II. Physical Decay Chart: Co 57, half life 270 days; Co 58, half life 71 days**

Weeks Before Activity Date	Co 57 µCi		Weeks After Activity Date	Co 58 µCi	
	Co 57 µCi	Co 58 µCi		Co 57 µCi	Co 58 µCi
10	0.60	1.48			
9	0.59	1.38	1	0.49	0.75
8	0.58	1.38	2	0.48	0.70
7	0.57	1.29	3	0.47	0.65
6	0.56	1.21	4	0.47	0.61
5	0.55	1.13	5	0.46	0.57
4	0.54	1.05	6	0.45	0.53
3	0.53	0.98	7	0.44	0.50
2	0.52	0.92	8	0.43	0.46
1	0.51	0.86	9	0.43	0.43
0*	0.50	0.80	10	0.42	0.40

\*Activity date

**RADIATION DOSIMETRY:** The estimated absorbed radiation doses<sup>1</sup> to an average patient (70 kg) following the oral administration of one Dicapac capsule of Co 57 and one of Co 58 at calibrated nominal activities of 0.5 µCi and 0.8 µCi, respectively, are shown in Table I.

**Table I. Radiation Doses**

Tissue	Absorbed Radiation Dose			
	(rads/0.5 µCi Co 57 + Intrinsic Factor)		(rads/0.8 µCi Co 58)	
	Normal	Pernicious Anemia	Normal	Pernicious Anemia
Liver*	0.065	0.14	0.03	0.03
Stomach	0.00041	0.00027	0.00042	0.00042
Small Intestine	0.00007	0.00043	0.0013	0.0013
Upper Large Intestine	0.00013	0.00070	0.0021	0.0021
Lower Large Intestine	0.00030	0.0018	0.0053	0.0053
Testes*	0.0026	0.0074	0.00037	0.00037
Ovaries*	0.0033	0.010	0.0021	0.0021
Whole-body*	0.0050	0.012	0.0022	0.0022

\*The administration of a flushing dose of non-radioactive B<sub>12</sub> will decrease the doses to the liver, gonads, and whole-body from Co 57 and Co 58 by about 30%.


<sup>1</sup>Method of Calculation: A Schema for Absorbed-Dose Calculation for Biologically Distributed Radionuclides, Supplement No. 1, MIRD pamphlet No. 1, J. Nucl. Med., p. 7, 1968.

**HOW SUPPLIED:** Each Dicapac Kit consists of five single-test cylinders and two 8 ml vials containing the standard solutions. The vial containing the blue solution is the Co 57 standard and the vial containing the yellow solution is the Co 58 standard. Each standard solution is prepared so that 1 ml of solution is equivalent to 2% of the total activity of each of the corresponding capsules.

Each cylinder contains two capsules and an ampule of unlabelled cyanocobalamin (1 mg). The red/ivory capsule contains 0.25 µg Co 58 cyanocobalamin (nominal activity 0.8 µCi at activity date). The purple/white capsule contains 0.25 µg Co 57 cyanocobalamin (nominal activity 0.5 µCi at activity date) bound to human gastric juice.

Dicapac Kits should be stored at 4°C and not used after the expiry date stated on the label.





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5. DIGITOXIN <sup>125</sup>I
6. TETRAMUNO <sup>125</sup>I
7. TRIMUNO <sup>125</sup>I
8. HPL <sup>125</sup>I
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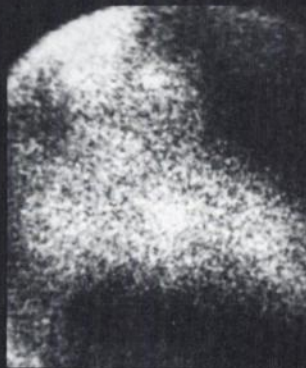
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RAO, SYSTOLE



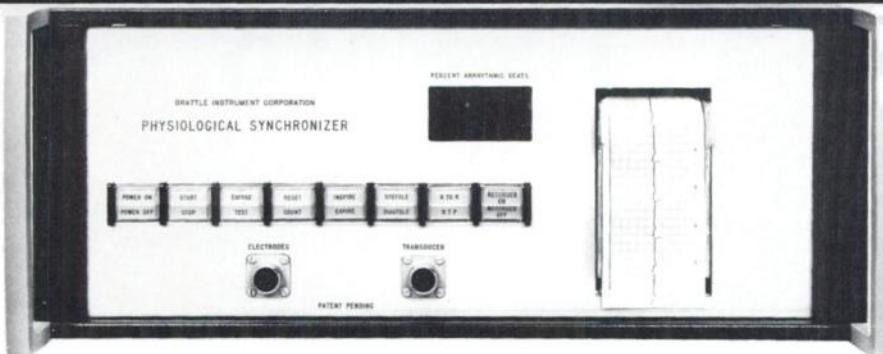
LAO, DIASTOLE



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 contrac-

tion posteriorly and akinesis of the septal aspect of the chamber. Write or call for a portfolio of Brattle-gated lung, liver and heart studies.



## No knobs, no meters, no errors

The spartan panel above tells the second-best part of our story. If you want to photograph peak systole, press the SYSTOLE button. If, say, you want systole only at full expiration, press the EXPIRATION button as well. If only breathing is relevant, don't press the heart button.

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

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It doesn't matter if the patient's heart rate and breathing depth change while he's under the colli-

ator 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.

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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.

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## Some Brattles have been in clinical use for over two years — very good hospitals have them

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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 (39 states so far, and growing). He can show you samples, give you a demo and arrange for you to have a machine of your own. (This is the best part of our story.)

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

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# 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  $^{99m}\text{Tc}$ -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.

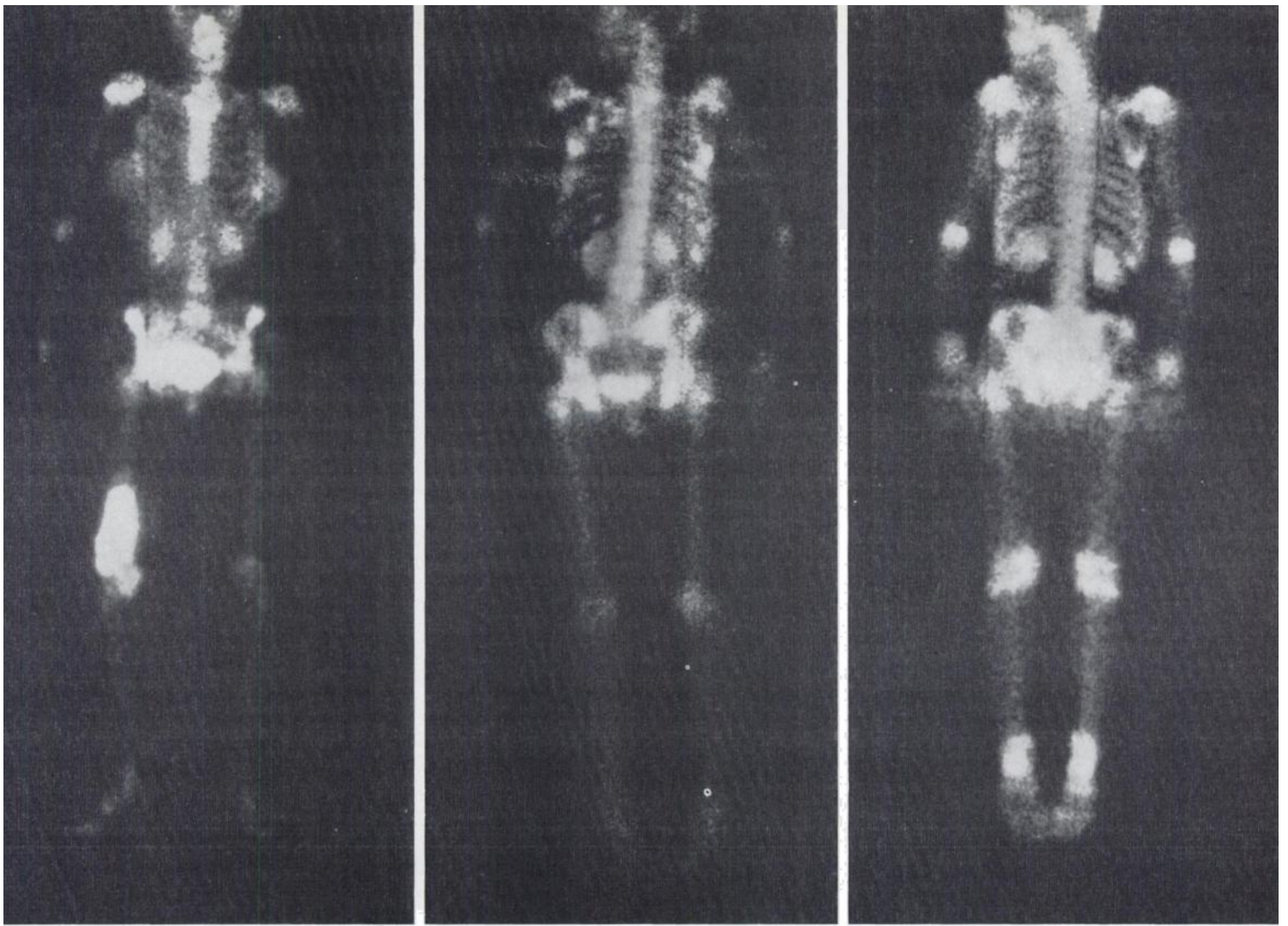
\* Thin Layer Chromatography (Cellulose acetate/85% methanol)

**A.** 15 mCi  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -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



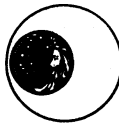
PROCTER & GAMBLE

# OSTEOSCAN<sup>®</sup>

(5.9 MG DISODIUM ETIDRONATE  
0.16 MG STANNOUS CHLORIDE)

SKELETAL IMAGING AGENT

See following page for brief summary of package insert.



PROCTER & GAMBLE  
**OSTEOSCAN**  
 (59MG DISODIUM ETIDRONATE  
 0.16MG 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  $^{99m}\text{Tc}$ -pertechnetate, these ingredients combine with  $^{99m}\text{Tc}$  to form a stable soluble complex.

**ACTIONS (CLINICAL PHARMACOLOGY)**

When injected intravenously,  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -labeled OSTEOSCAN.

Three hours after intravenous injection of 1 ml  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -labeled OSTEOSCAN administration, patients should be encouraged to drink fluids. Patients should void as often as possible after the  $^{99m}\text{Tc}$ -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  $^{99m}\text{Tc}$ -labeled OSTEOSCAN is 1 ml with a total activity range of 10-15 mCi.  $^{99m}\text{Tc}$ -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.

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# Three essentials in the practice of Radiology and Nuclear Medicine

With the growing complexities of radiology and nuclear medicine...with the development of new and modified equipment and instrumentation...and with an ever-increasing number of pharmacologic agents...an up-to-date, informational compendium can be an essential to daily practice in these specialties.

And at the risk of sounding immodest, we think the current Physicians' Desk Reference for Radiology and Nuclear Medicine is just such a compendium.

Like the regular PDR it provides categorized, cross-indexed product usage information—accurate, complete and easy to refer to. More than 300 radiopharmaceutical contrast agents and related products are described in detail.

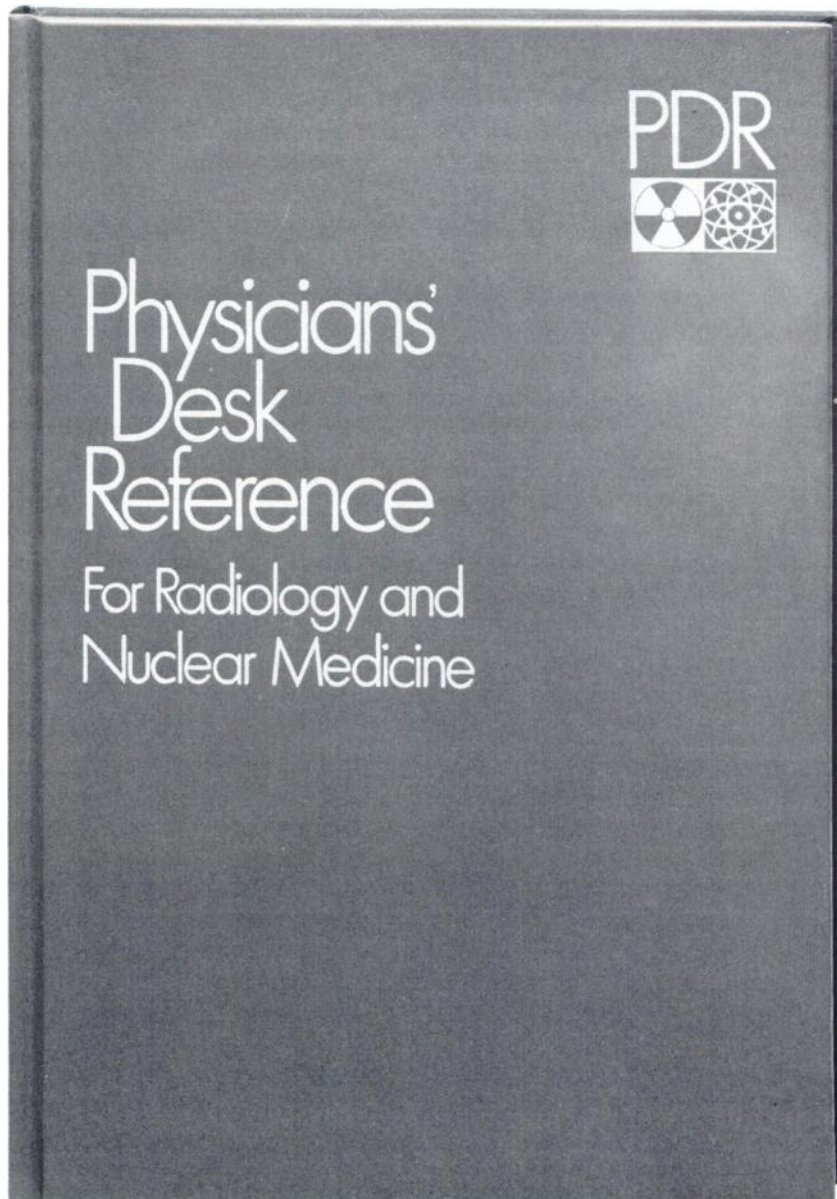
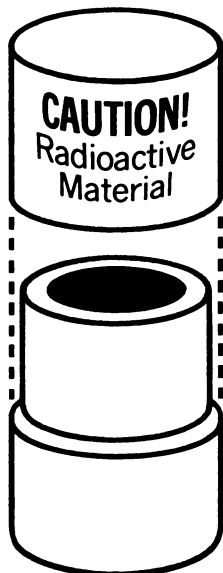
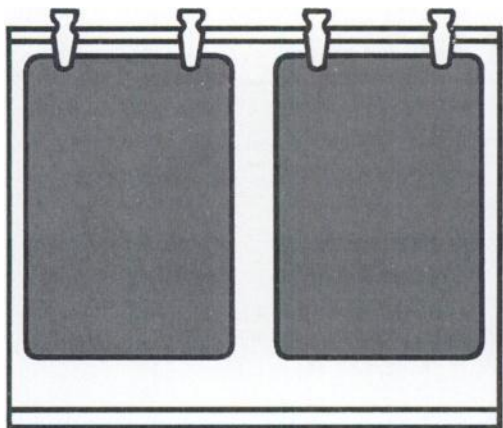
In addition, PDR for Radiology and Nuclear Medicine focuses specifically on equipment and instrumentation pertinent to radiology and nuclear medicine—presenting detailed product descriptions.

PDR for Radiology and Nuclear Medicine also contains a valuable section on available postgraduate educational materials. And it presents an important editorial review of current techniques in nuclear medicine by M. Donald Blaufox, M.D., Phd. and Leonard M. Freeman, M.D....along with a discussion of the clinical application of radiopharmaceuticals and *in vitro* test kits found in the product information section.

Right now PDR for Radiology and Nuclear Medicine is still relatively new. But we feel it's already becoming one of the most valued reference sources around.

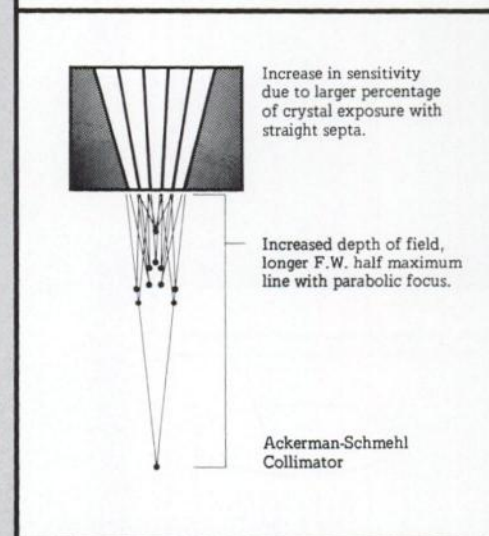
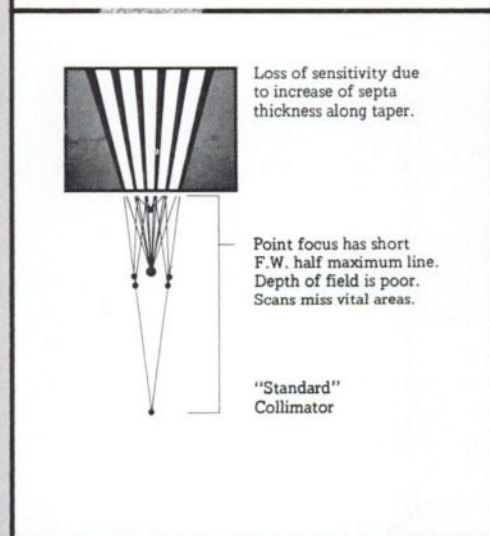
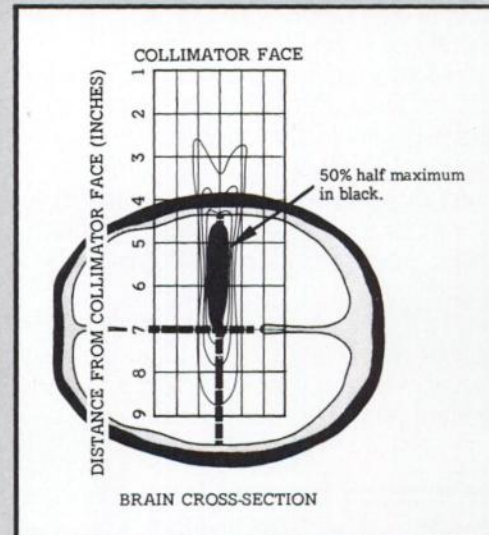
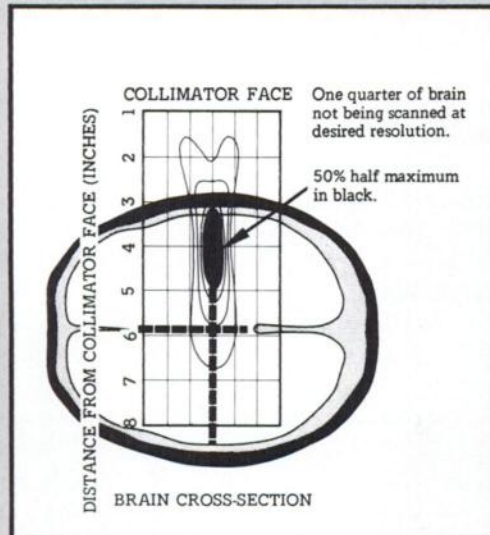
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With the collaboration of K. Schindler

Cerebral magnification angiography—a technique enabling radiographs to be taken of vessels only 80-100 $\mu$ m in diameter—has received a great deal of attention in recent years. The advantages of this technique are readily apparent in X-rays of normal vessels, but are even more obvious when brain tumors or intracranial lesions occur. Cerebral magnification angiography thus represents a significant advance in diagnostic technique.

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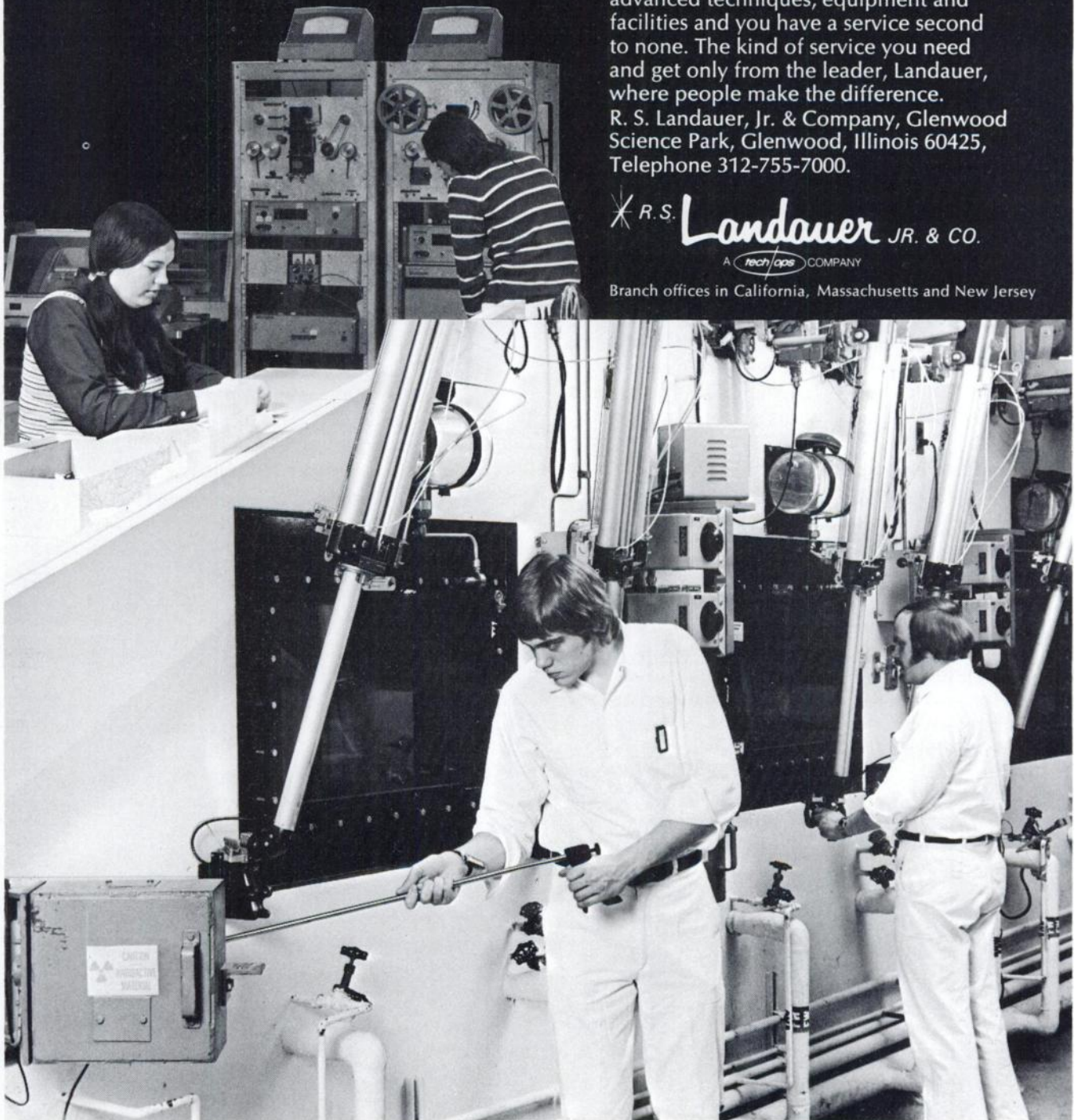
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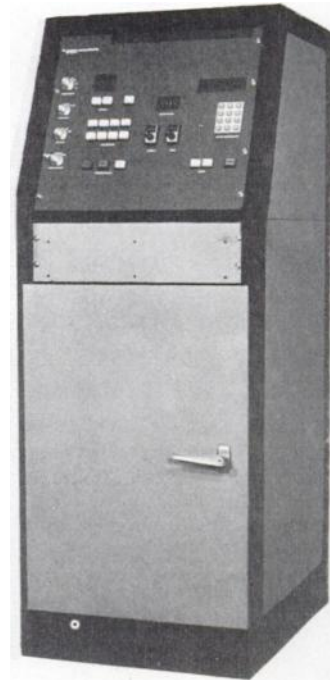
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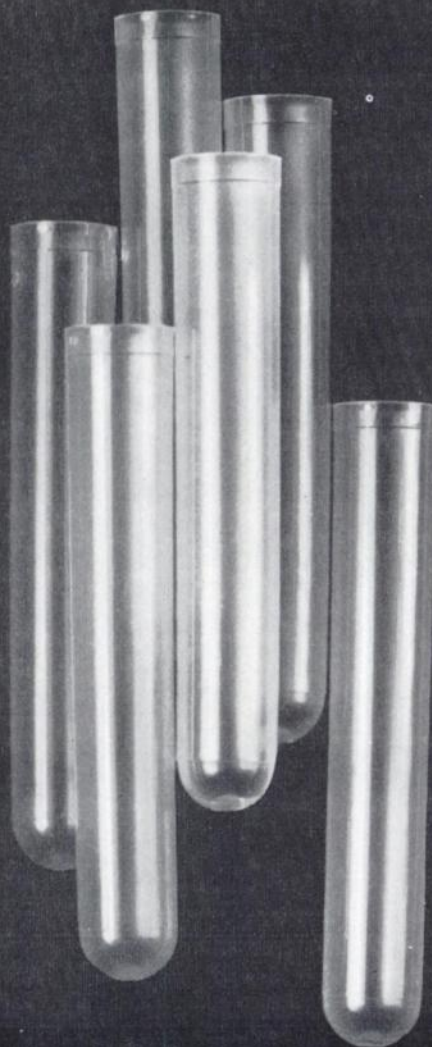
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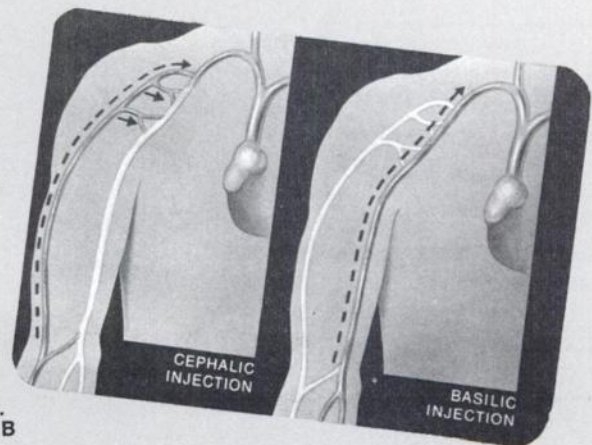
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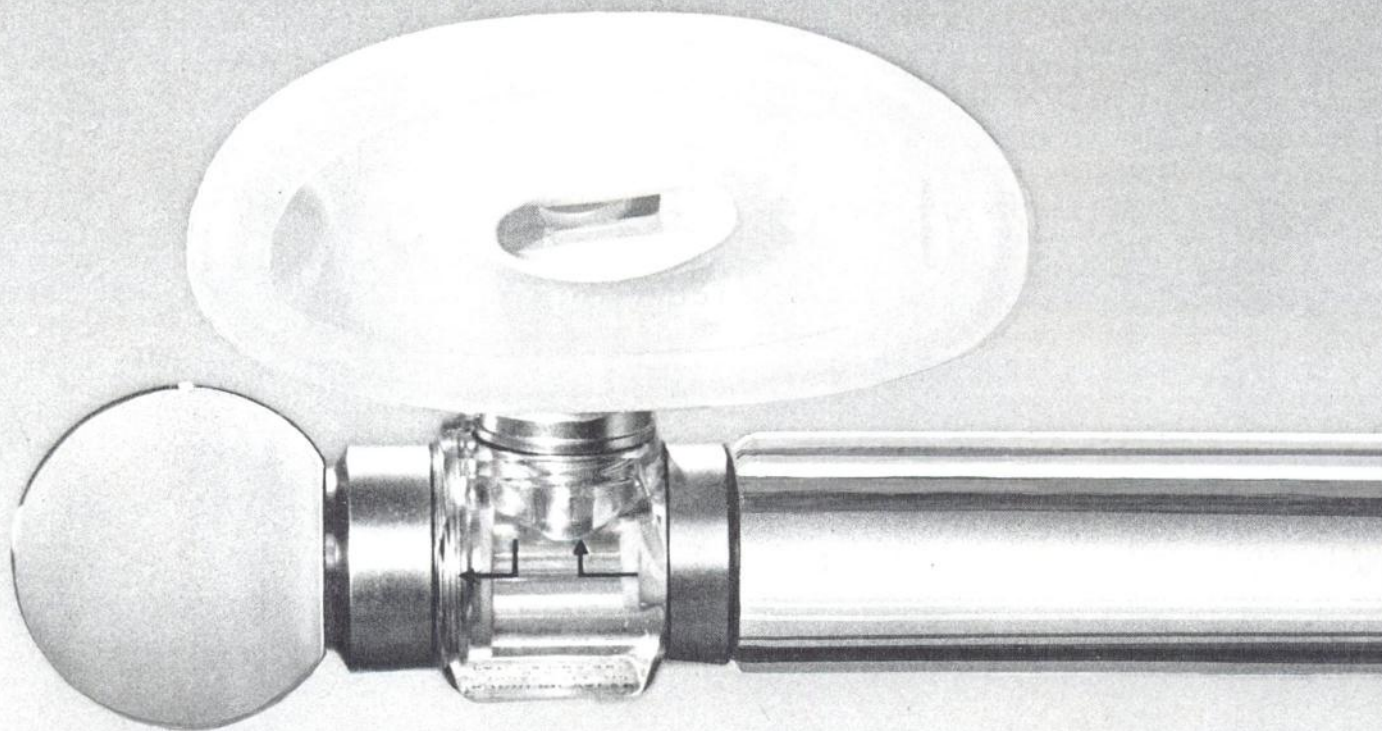
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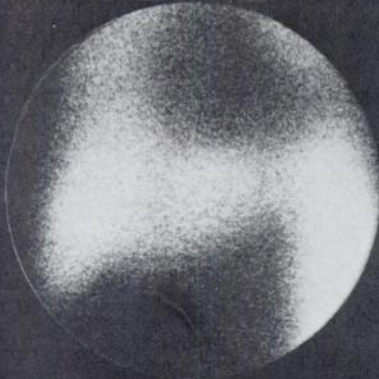
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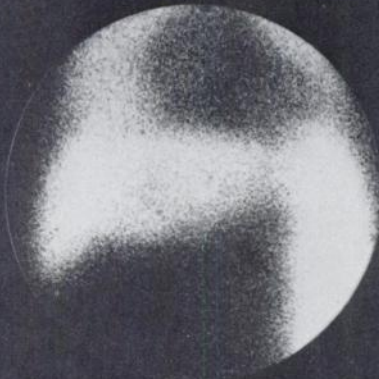
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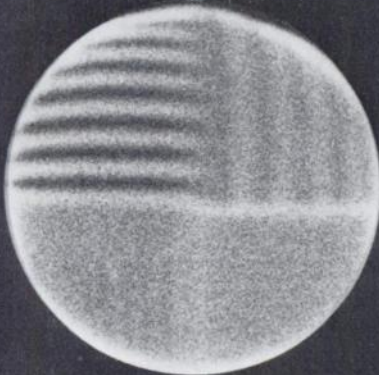


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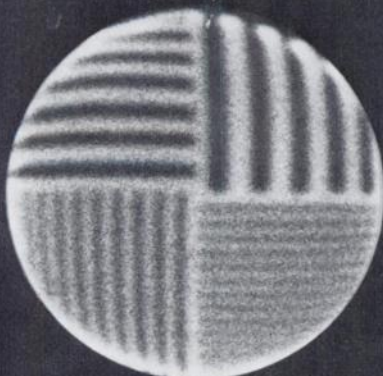


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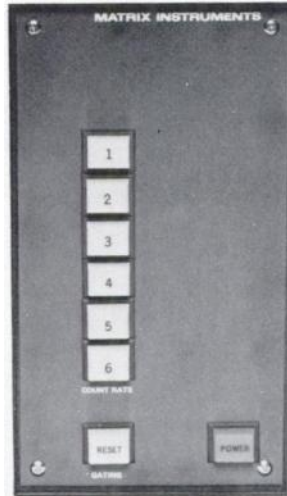


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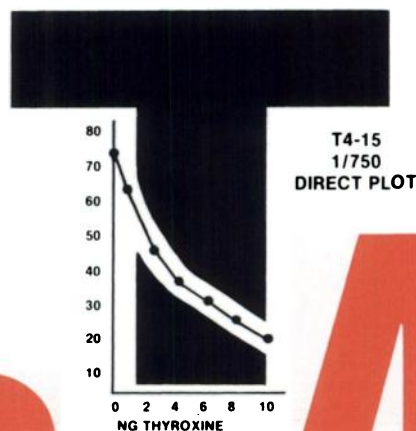
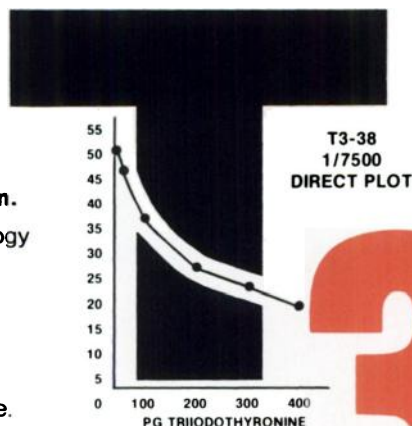
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## POSITIONS WANTED

**ARRT NUCLEAR MEDICINE TECHNOLOGIST** desires change. Graduate of Duke University School of Nuclear Medicine with several years field experience. Versed in opening and managing nuclear division. Please reply to Box 103, Society of Nuclear Medicine, 475 Park Ave. South, New York, N.Y. 10016.

**NUCLEAR MEDICINE TECHNOLOGIST** desires a job in the educational end of nuclear medicine. B.S. in Education. Teaching experience. RT (ARRT) and NM (ASCP). Please reply to Box 104, Society of Nuclear Medicine, 475 Park Ave. South, New York, N.Y. 10016.

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**ARRT NUCLEAR MEDICINE TECHNOLOGIST** desires Chief/or Administrator position. Four years experience, approximately 2½ years as Chief at University Medical Center. New York City or San Francisco area preferred. Please reply to Box 106, Society of Nuclear Medicine, 475 Park Ave. South, New York, N.Y. 10016.

**NUCLEAR MEDICINE PHYSICIAN** completing two-year university training in June '75, experienced in imaging, in vitro, research, thyroid diseases, and therapy, desires full-time position. Reply Box 107, Society of Nuclear Medicine, 475 Park Ave. South, New York, N.Y. 10016.

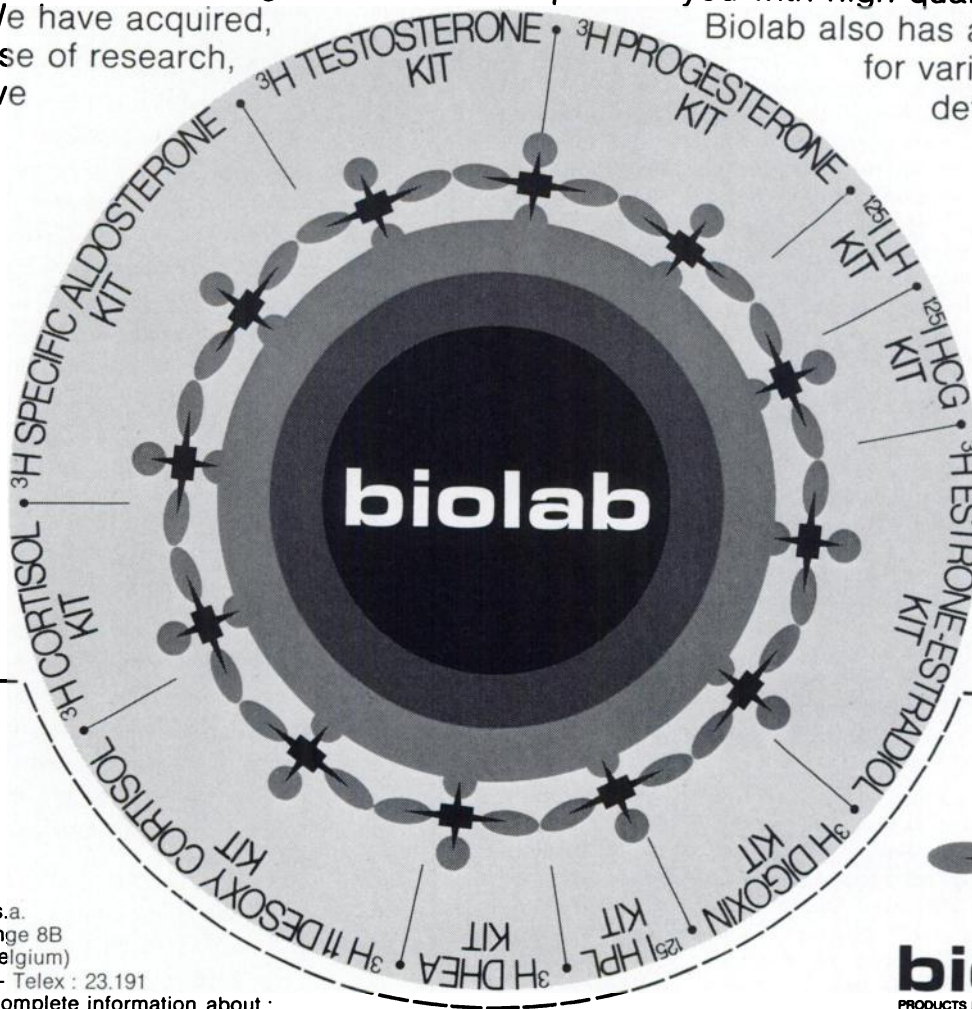
**REGISTERED NUCLEAR MEDICINE technologist,** seven years experience, five years as chief technologist. Experience includes budget forecasting, scanner and camera imaging, and RIA experience. Reply Box 108, Society of Nuclear Medicine, 475 Park Ave. South, New York, N.Y. 10016.

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The salary attached to the appointment is R15,600 (fixed).

Intending applicants are advised to obtain a copy of the Information Sheet relating to the post from the Registrar, University of the Witwatersrand, Jan Smuts Avenue, Johannesburg 2000, South Africa, with whom applications should be lodged not later than 28th February 1975.

**JNM CLASSIFIED PLACEMENT  
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This section in the Journal of Nuclear Medicine contains "Positions Open", "Positions Wanted", and "For Sale" listings. Nondisplay "Positions Wanted" ads by members of the Society are billed at 30¢ per word for each insertion with no minimum rate. Nondisplay "Positions Wanted" ads by nonmembers and all nondisplay "Positions Open" and "For Sale" ads by members and nonmembers are charged at 65¢ per word, with a minimum of \$15. Display advertisements are accepted at \$50 for 1/8 page, \$90 for 1/4 page, \$165 for 1/2 page, and \$295 for a full page. Closing date for each issue is the 15th of the second month preceding publication. Agency commissions and cash discounts are allowed on display ads only. Box numbers are available for those who wish them.

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The submission of abstracts of original contributions in nuclear medicine is requested for consideration for the scientific program. The chapter is offering \$100 and \$50 prizes respectively for the two best scientific papers presented. To be eligible for consideration for the prize, papers must represent unpublished, original work by the authors. (Unpublished papers, submitted for publication and not previously presented, are eligible.) Abstracts of competitive papers must be received by the deadline. Papers will be judged on originality, significance to nuclear medicine, and the quality of the work and its presentation.

**Guidelines for abstracts:**

1. Abstract should contain a statement of purpose, methods used, results, and conclusions.
2. Abstract should not exceed 300 words.
3. Give title of paper and name of author(s) as you wish them to appear on the program. Underline the name of the author who will present the paper.
4. Send abstract and four copies to:

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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  
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**Consultant in Nuclear Medicine in London**

Applications are invited for the full-time or maximum part-time post of Consultant in Nuclear Medicine in a new Department of Nuclear Medicine at King's College Hospital within the King's Health District and the Brook General Hospital within the Greenwich & Bexley Area Health Authority.

Candidates should be medically qualified. The successful applicant will be expected to co-ordinate and develop the Nuclear Medicine activities of the two hospital groups, and to plan the further developments of the Department at King's College Hospital. He will also collaborate in research and undertake teaching of undergraduate and postgraduate levels.

Further information may be obtained from the District Personnel Administrator, King's College Hospital, Denmark Hill, London, S.E.5 9RS England. Tel: 274-6222 Ext. 2724/8, to whom applications should be submitted by three weeks after date of insertion.

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Applicants are invited from registered nuclear medicine technologists for a staff position in the nuclear medicine department.

Apply to:

**Miss F. Des Autels, RTRNM, Sub-Department of Nuclear Medicine, Royal Victoria Hospital, 687 Pine Avenue West, Montreal, Quebec H3A 1A1.**

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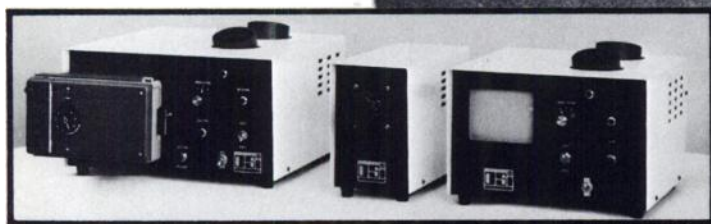
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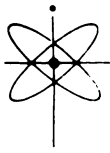


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Applications are invited for the position of Director of Nuclear Medicine from medical practitioners with appropriate postgraduate qualifications enabling registration in South Australia as a specialist, and extensive experience in nuclear medicine. (The present director has resigned to take up a position in the United States.)

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Approximately 13,000 procedures are performed per annum. The responsibilities of the Division also include operation of the whole-body counter in the Royal Adelaide Hospital. The department is and will remain the main central facility of its kind in South Australia. With the introduction of ultrasound and an E.M.I. scanner, close co-operation with the hospital department of radiology is under consideration to cover a full range of organ imaging.

Applications stating full name; place, date and year of birth; nationality; marital status; past and present employment; details of academic record and qualifications; experience and published work; together with the names of three referees, should be sent to the Director, Box 14, Rundle Street Post Office, Adelaide, South Australia 5000.

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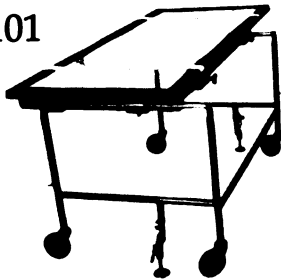
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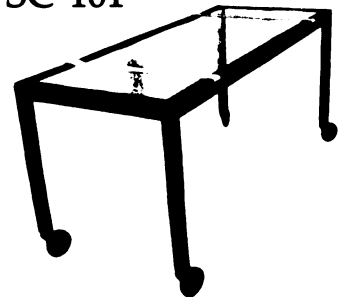
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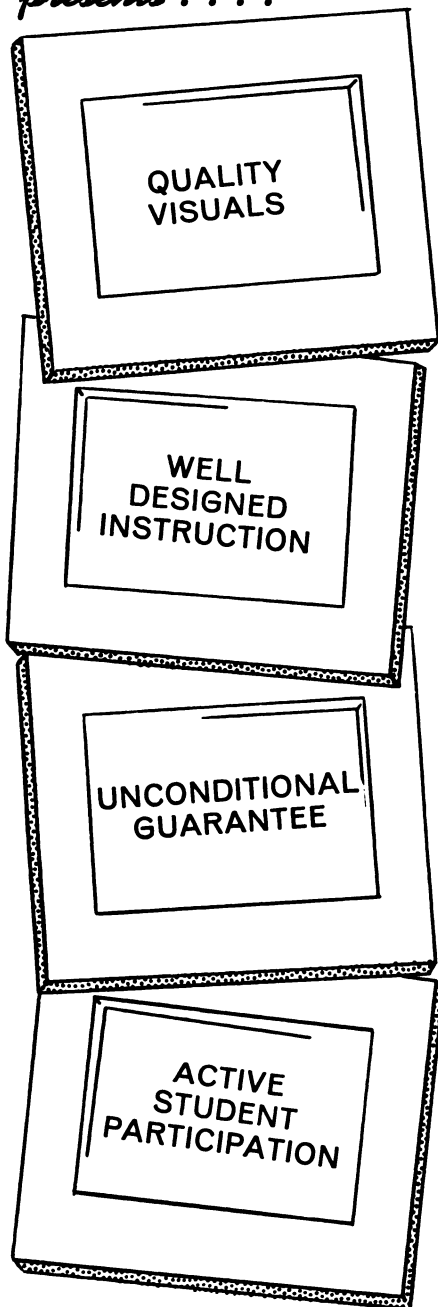


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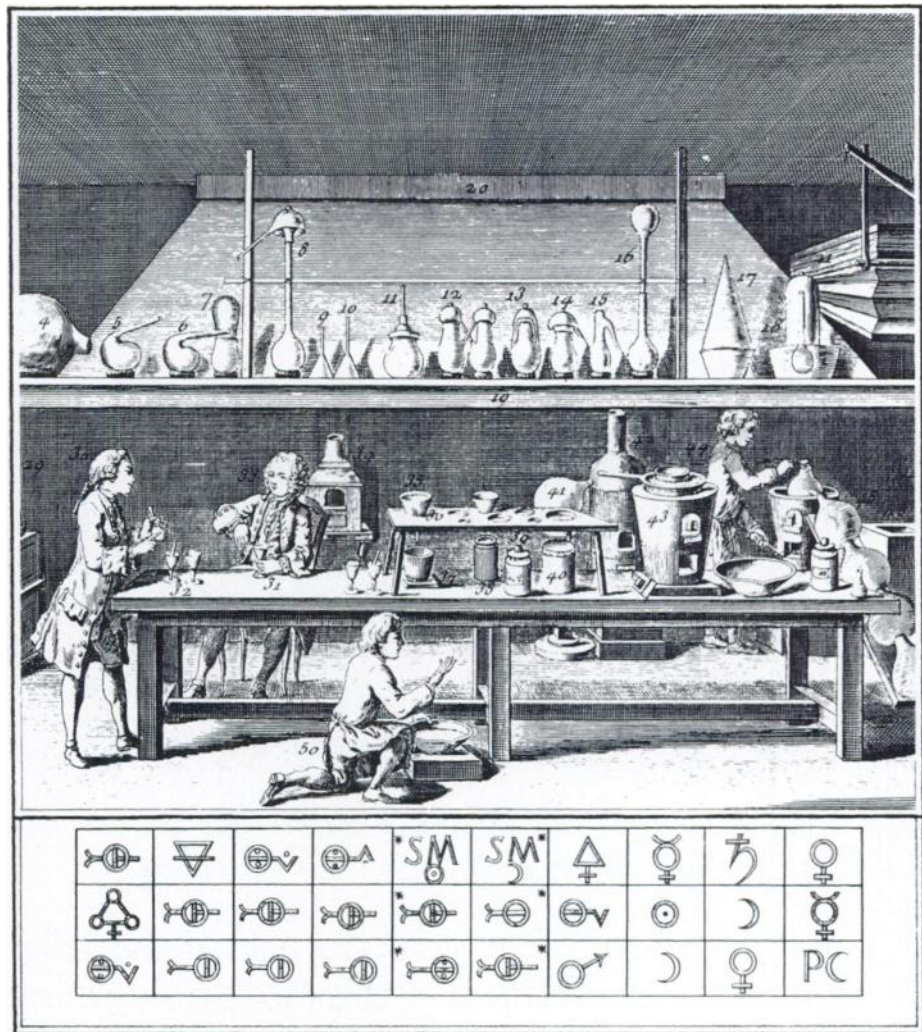
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definitely NO uptake in the thyroid, choroid plexus, salivary glands or stomach *(same argument...)*

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our kit has been designed even for price-conscious hospitals *(just ask for our prices – you will see for yourself)*

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*(Which is not just another scanning agent...)*

# <sup>99m</sup>Tc **SOLCOSCINT®** **DTPA**

*(Just another one – but ours)*

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contains over 99.5% <sup>99m</sup>Tc-DTPA.

If this is hard to believe, write us: we will give the method to test it for yourself.

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#### Shelf life:

The kit is stable for more than 6 months (stored in the refrigerator).

#### Preparation:

Single step preparation. Just add <sup>99m</sup>Tc-pertechnetate from any commercial generator and shake briefly.

#### Radiopharmaceutical data of the injectable preparation:

<sup>99m</sup> Tc-Diphosphate content:	> 99%
<sup>99m</sup> TcO <sub>4</sub> content:	< 1%
Content of Diphosphate/Tin/ <sup>99m</sup> Tc-complex:	26.0 mg
<sup>99m</sup> Tc bound in Diphosphate:	0.2 ng/mCi
DL <sub>50</sub> :	62 mg/kg
Volume:	2-6 ml
pH:	~ 6.5
Aspect:	colourless fluid
Administration:	intravenously
Side effects and adverse reactions:	none

#### Administered dose:

5-10 mCi

#### Optimal scanning time:

3-4 hours following intravenous injection. Patients with renal insufficiency or older patients with slower blood clearance should be scanned 5-6 hours following injection. Patients under 25 years of age can be scanned after 2 hours.

#### Indications:

Inflammatory diseases of the joint, osteolytic and osteoblastic bone processes, primary bone metastases, bone tumors plasmocytoma, Paget's Disease, Morbus Bechterew, bone fractures, other bone diseases.

#### References:

1. *Secrest, R. J., Mockett, R. E.* Bone imaging techniques using <sup>99m</sup>Tc-labeled compounds. *J. Nucl. Med. Techn.* 4: 21-42, 1973
2. *Barker, J. P.* <sup>99m</sup>Tc-Pyrophosphate - A new bone-seeking nuclide. *J. Nucl. Med. Tech.* 1: 24-26, 1973
3. *Hosain, F., et al.* Comparison of 18F, 87mSr, and <sup>99m</sup>Tc-labeled Polyphosphate, Diphosphonate, and Pyrophosphate for bone scanning. *J. Nucl. Med.* 14: 410, 1973

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#### Shelf life:

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#### Preparation:

Single step preparation. Just add <sup>99m</sup>Tc-pertechnetate from any commercial generator and shake briefly.

#### Radiopharmaceutical data of the injectable preparation:

<sup>99m</sup> Tc-DTPA content:	> 99%
<sup>99m</sup> TcO <sub>4</sub> content:	< 1%
DTPA/Sn/ <sup>99m</sup> Tc-complex:	36.8 mg
<sup>99m</sup> Tc bound in DTPA:	0.19 ng/mCi
DL <sub>50</sub> :	163 mg/kg
Volume:	2-6 ml
pH:	~ 7
Aspect:	colourless fluid
Shelf life:	3 hours
Administration:	intravenously
Side effects and adverse reactions:	none

#### Administered dose:

Brain Studies: Dynamic: 15-25 mCi  
Static: according to scanner or camera specifications.

Kidney Studies: Dynamic: 2-4 mCi  
Static: 2-4 mCi

#### Optimal scanning time:

Dynamic brain studies: immediately after application  
early scan: after 10-30 min.  
late scan: after 2-3 hours

Static brain studies: early scan: after 10-30 min.  
late scan: after 2-3 hours

Static kidney studies: 1-3 hours and later

#### Indications:

Dynamic and static brain studies; detection of brain tumors and other space occupying lesions  
Kidney scanning and kidney function studies  
Gastric emptying time  
Dynamic studies of the heart, lungs and extremities.

#### References:

1. *Hauser, W., et al.* Technetium-<sup>99m</sup>-DTPA: A new radiopharmaceutical for brain and kidney scanning. *Radiology* 94: 679-684, 1970
2. *Sziklas, J. J., Hosain, F., et al.* Comparison of <sup>199</sup>Yb-DTPA, <sup>113</sup>In-DTPA, <sup>14</sup>C-inulin and endogenous creatinine to estimate glomerular filtration. *J. Nucl. Biol. Med.* 15: 122, 1971
3. *Chaudhuri, T. K.* Use of <sup>99m</sup>Tc-DTPA for measuring gastric emptying time. *J. Nucl. Med.* 6: 391-395, 1974



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Series 110 Camera.



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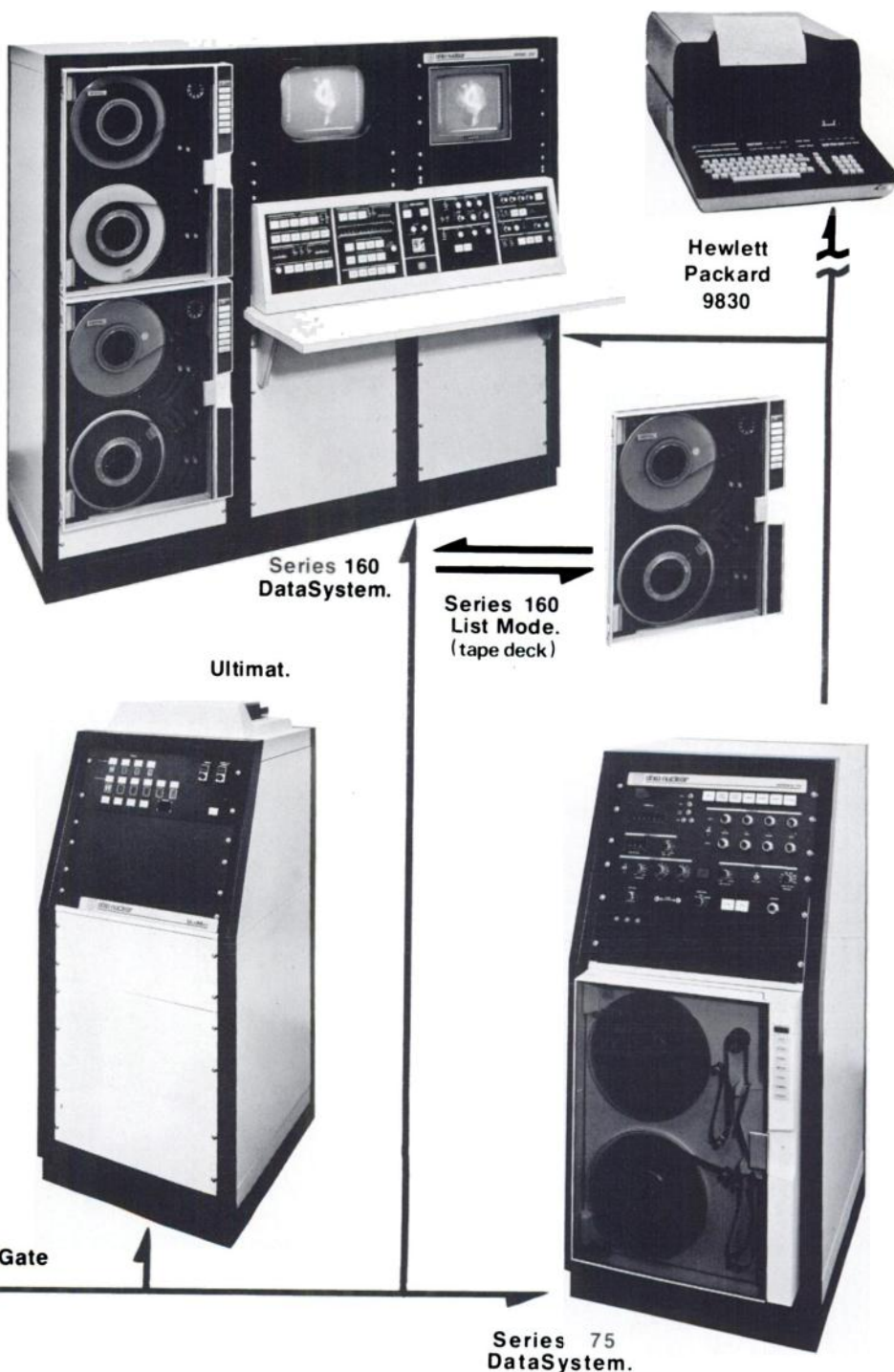
**Series 160 DataSystem.** A complete digital imaging system offering non-flickering interactive video display; fast dynamic studies (up to 50 frames/sec. with no data loss); optional variable persistence viewing; high resolution (up to 16K-128 x 120 matrix—depending on selected mode of operation); CRT viewing of isometric displays, profile histograms and uptake studies; 8, 16, or continuous color video presentation; computer compatible (uses 9 track 800 B.P.I. tape); up to 16 rectangular and/or 6 irregular regions of interest; contrast enhancement; alpha numeric display; field uniformity correction; and statistical smoothing.

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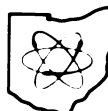
**Series 160 List Mode.** Allows collection of dynamic study data in real time, and playback at variable framing rates of up to 50 frames/sec. at 16K resolution.

**Hewlett Packard 9830** A programmable calculator which, when interfaced with a Series 160 or Series 75 DataSystem, permits automatic calculation of significant pre-selected parameters such as ejection fraction, wash-out half-times, etc.

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- MINITEC has its own handle for easy lifting, easy carrying and reduced hand exposure
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Designed for easy elution

- Sets up in seconds
- Elutes in only 3 minutes after eluent vial has emptied

Designed for safety

- No exposed tubing when eluting
- 1⅝" lead surrounds the MINITEC column *and...*

*...another 1½" lead protection from MAXI-SHIELD*  
That means 3⅞" of lead reduces radiation from the column by 99.98%.

**MAXI-SHIELD™** is 137 pounds of interlocking lead half rings for easy assembly, easy use, but *no* direct line of radiation.

Just remove the cap for elution, replace for constant shielding when not in use. The new MINITEC Generator is available in 50, 100, 200, and 300 mCi potencies. And MAXI-SHIELD you get free with your first MINITEC Generator purchase.

*See following page for brief summary.*

For illustration purposes only.  
In Vitro Products not for scanning.  
See following page for Technetium 99m indications.

# Minitec™ (Technetium 99m) Generator



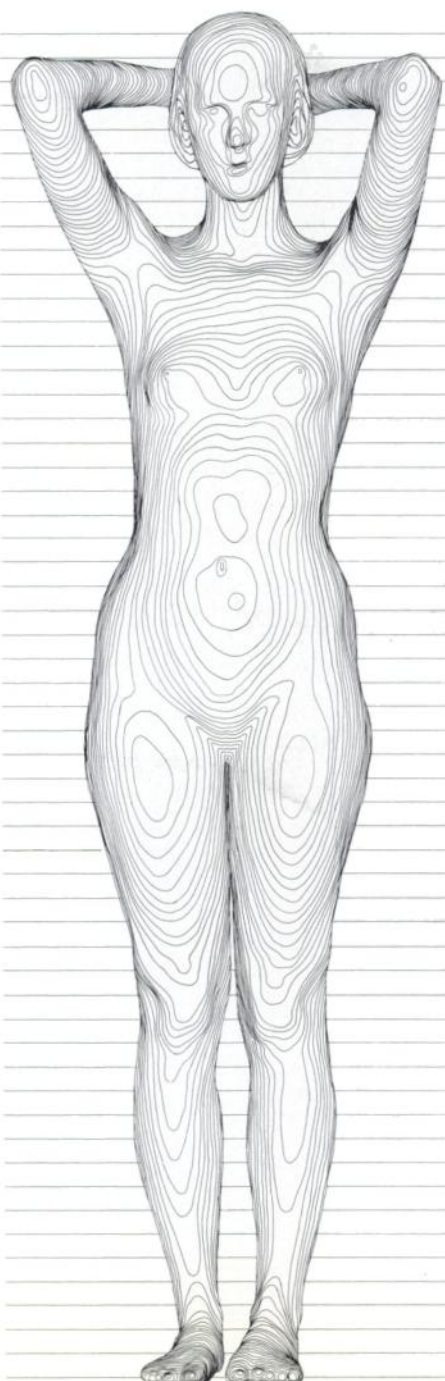
Minitec™ (Technetium 99m) Generator provides a means of obtaining a sterile, non-pyrogenic supply of technetium 99m (<sup>99m</sup>Tc) as sodium pertechnetate <sup>99m</sup>Tc.

**Indications:** Sodium pertechnetate <sup>99m</sup>Tc is indicated for brain imaging, thyroid imaging, salivary gland imaging, blood pool imaging, and placenta localization.

**Contraindications:** At present, there are no known contraindications to the use of sodium pertechnetate <sup>99m</sup>Tc.

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

This radiopharmaceutical should not be administered to women who are pregnant or who may become pregnant or during lactation unless the information to be obtained outweighs the possible potential risks from the radiation exposure involved. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of child-bearing capability should be performed



during the first few (approximately 10) days following the onset of menses.

Since radioactive pertechnetate is secreted in milk during lactation, formula-feedings should be substituted for breast-feedings.

**Important:** Since material obtained from the generator may be intended for intravenous administration, aseptic technique must be strictly observed in all handling. Only the eluent provided should be used to elute the generator. Do not administer material eluted from the generator if there is any evidence of foreign matter.

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

At the time of administration, the solution should be crystal clear.

**Adverse Reactions:** At present, adverse reactions have not been reported following the use of sodium pertechnetate <sup>99m</sup>Tc.

For complete prescribing information, consult package insert.

**How Supplied:** Minitec (Technetium 99m) Generator is available in potencies of 50, 100, 200, and 300 mCi. Supplied with the generator are vials of eluent containing 5 ml. of a sterile, non-pyrogenic solution of 0.9% sodium chloride in water for injection. Also supplied is suitable equipment for eluting, collecting, and assaying the technetium 99m.

Medotopes\*



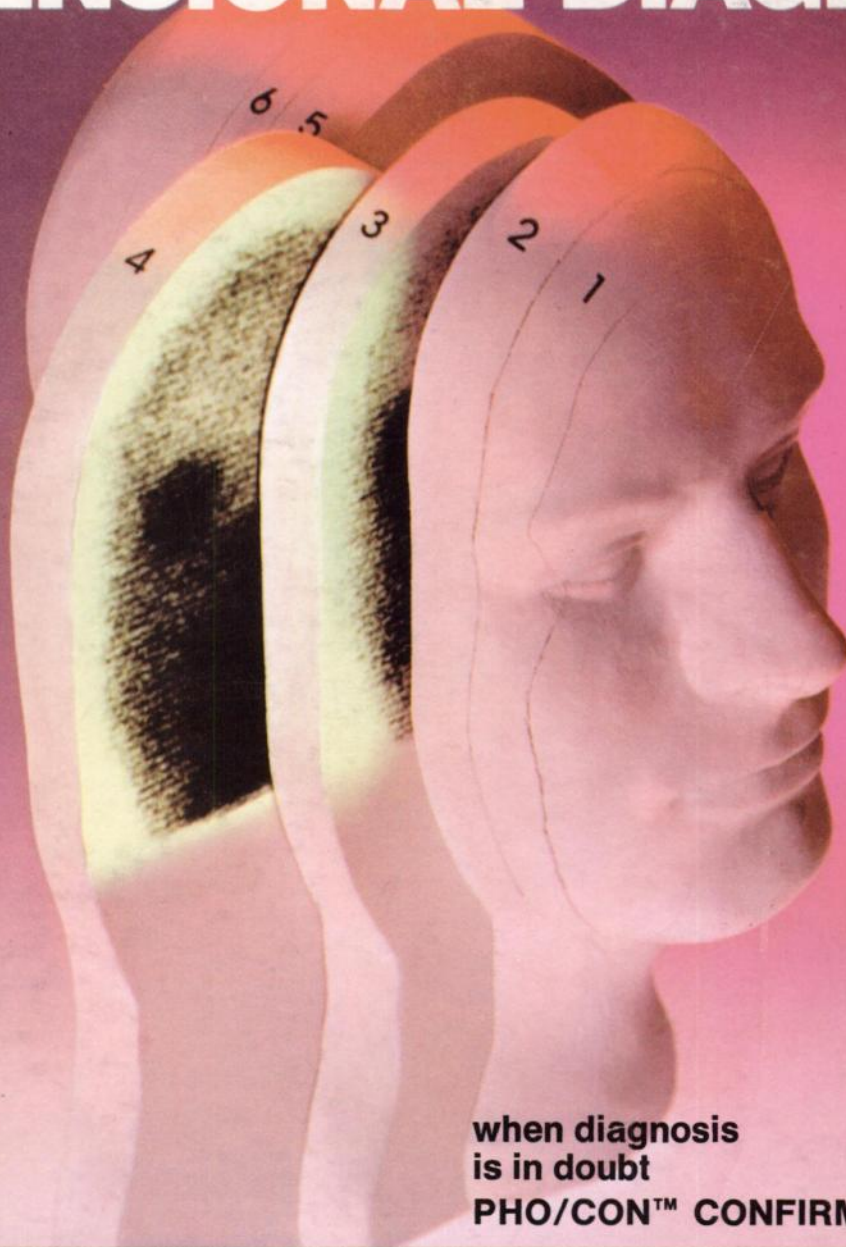
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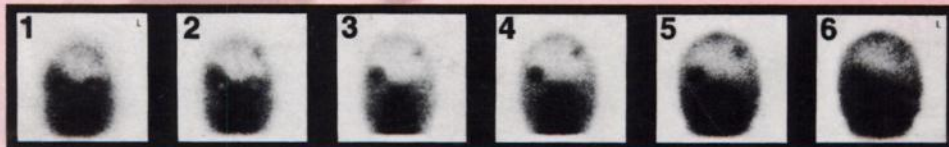
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