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is like having  
your own  
radiopharmacist  
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# 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.**

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# T4-Test-kit

For the determination  
of total thyroxin  
in serum

Radiodiagnosics



BEHRING INSTITUTE

*S. Behring*

**The time-saving  
T4-test  
for your lab.:  
pipette once,  
incubate  
for one hour,  
automatic  
phase separation,  
measure.**

**Contents:** 12 reagent tubes with 3.3 ml TBG-T4-(J-125)-solution each • total activity: 1  $\mu$ Ci J-125 • preservative: 0.02 % sodium azide • 12 adsorption tubes • 1 standard serum of defined T4-concentration, lyophilized.

**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 5114 • 1 package 12 tests

HOECHST AG • 6230 Frankfurt (Main) 80 • Behring Department

# Steps for the determination of total thyroxin in serum



**1**

Extract from centrifuging glass

**2**

Alcohol extraction:  
1.0 ml ethanol  
+ 0.5 ml patient serum  
dropwise

Mix-centrifuge  
Pipet 0.3 ml of supernatant extract into special T4 reagents tube

**3**

Attach adsorption tube



**4**

Mix contents



**5**

Count total activity



**6**

Rotate for an hour



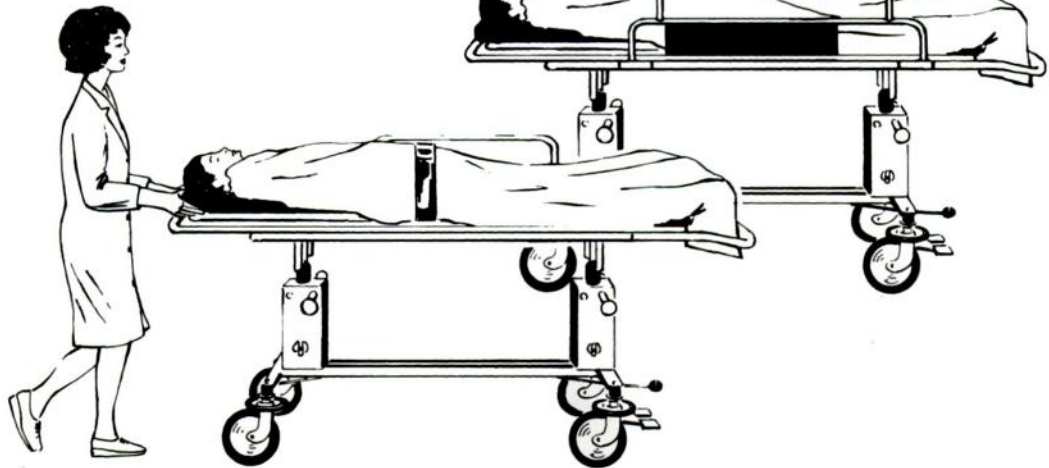
**7**

Count activity remaining in solution



Calculate G-value:  
$$G = \frac{\text{remaining activity}}{\text{total activity}}$$

# The "TranScan"<sup>TM</sup> is a "two-fer"



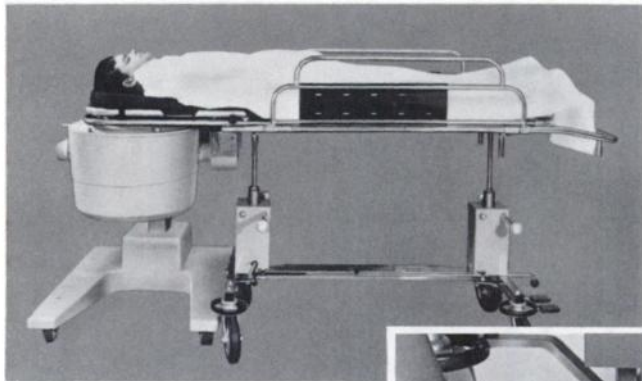
The **ONLY** dual-purpose imaging table designed for

1. **PATIENT TRANSPORTATION**, and
2. **PATIENT EXAMINATION** during nuclear medicine imaging procedures.

...*"two-fer" the price of one.*

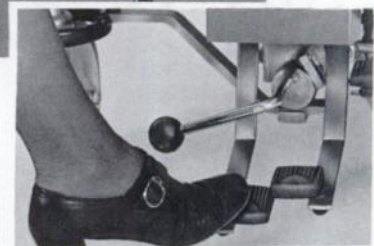
- Minimizes patient handling. Patients transferred from bed to the "TranScan" need not be moved to another table for examination.
- Effortless maneuverability—vertical & horizontal. Wide floating top permits 22" longitudinal travel. Top tilts to 45° angle for easy posterior and Townes-view positioning.
- Foot-lever hydraulic lift can raise and lower patients 33" to 45" above the floor. Capacity 400 lbs.

**Rides effortlessly...  
offers maximum  
positioning control.**



Camera head can be positioned under the center or either end of table.

Dual-pedal foot control permits table to be raised, lowered and angled.



For full details, ask for Bulletin 161-B

TM Nuclear Associates Inc.



**NUCLEAR ASSOCIATES, INC.**

Subsidiary of

**RADIATION-MEDICAL PRODUCTS CORP.**

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Put it to work in your laboratory,  
and you'll see patient management  
improve eight ways.



# The Res-O-Mat<sup>®</sup> ETR<sup>®</sup> Thyroid Test.

The *Res-O-Mat ETR* test is a single in vitro test which rapidly and accurately reports the functional status of the thyroid. Thus it can play a vital role in improving the clinical management of patients.

The *ETR* test is not affected by many of the factors that can distort other thyroid tests and complicate clinical diagnosis, because it indicates the patient's "free" or metabolically effective thyroxine. In essence, it combines the concepts of T3 and T4 testing because it simultaneously considers total T4 concentration and the saturation of hormone binding sites on protein.

The picture illustrates a variety of clinical situations in which the *ETR* test can provide reliable diagnostic information when other thyroid tests might be misleading:

1. The *ETR* test is unaffected by abnormal TBG levels resulting from pregnancy. (While a T3 will normally report a pregnant euthyroid patient to be



hypothyroid and a T4 will reflect hyperthyroidism, an *ETR* will indicate the true euthyroid condition.)

2. The effect of the pill or estrogen medication on TBG levels does not interfere with the *ETR* value.

3. Although contrast media, such as used in an IVP study, will distort a PBI test, the *ETR* result will not be affected.

4. Abnormal protein levels of sick euthyroid patients with such problems as nephrosis or liver conditions may affect T3 and T4 results. The *ETR*, on the other hand, will report reliable information.

5. The *ETR* test can be successfully used in initial and long-range monitoring of hypothyroid patients undergoing replacement therapy with either synthetic or desiccated hormones.\*

6. *ETR* is also reliable in assessing the progress of patients receiving antithyroid treatment such as tapazole or propylthiouracil. The *ETR* test can also monitor the hormone output of a patient on I-131

therapy both during and after treatment.

7. Iodides and other drugs, such as diphenylhydantoin and salicylates, won't affect the *ETR* as they do many other test results.

8. *ETR* has proven very useful in the evaluation of thyroid function during the neonatal period and infancy.

If you want further information on the *Res-O-Mat ETR* test, contact your Mallinckrodt representative. He is ready to provide complete details and explanatory literature, or to assist you in any way that he can.

\*Patients receiving d-thyroxine or replacement liothyronine (T3) therapy will give erroneous results as with other thyroid function tests.

Mallinckrodt, Inc.  
675 Brown Road  
Hazelwood, Missouri 63042



# You can increase patient scan capacity 25% or more with a Cameray<sup>®</sup> 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:

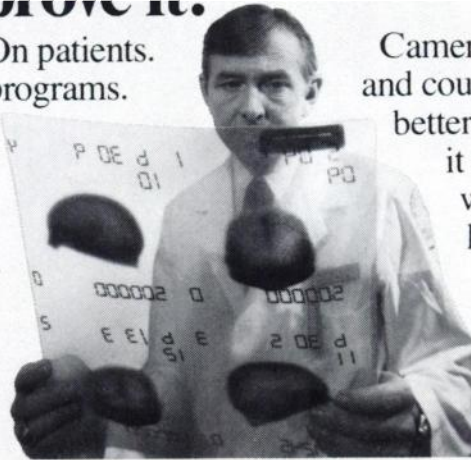
- All controls more accessible — because they are all on the console control panel.
- Patient numerics right on film for improved efficiency and confidence in accuracy.
- Collimators designed for quick changes.
- Repeatability assured from scan to scan without recalibration.
- Optional x-ray matrix feature 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

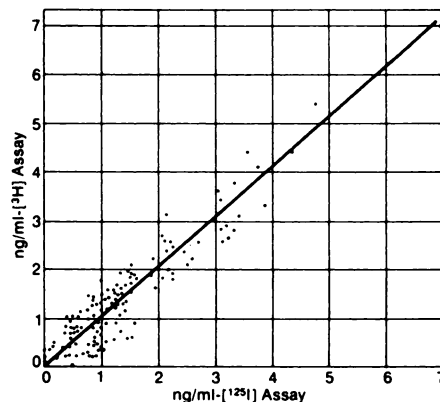
gamma scan efficiency for you.

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





# Ours correlate.



## Digoxin $[^{125}\text{I}]$ RIA kit Digoxin $[^3\text{H}]$ RIA kit

Discrepancies in values when comparing commercially available  $^3\text{H}$  and  $^{125}\text{I}$  Digoxin RIA kits have been reported<sup>1</sup>. So we developed our  $^{125}\text{I}$  kit to solve that problem, and the results of 159 clinical samples (shown above) revealed no systematic bias between the assays. This data has been confirmed by an outside laboratory as well. We invite you to test ours too.

NEN's method uses a unique, highly immunoreactive iodinated digoxin derivative which results in a very sensitive system. Reproducibility is excellent, the protocol simplified. Let us send you complete technical data and ordering information.

<sup>1</sup>Burnett et al, Clin. Chem. 19, 725, 1973, and Blumberg, J.M., presented at a symposium on Radioimmunoassay, Washington, D.C., Jan. 28-29, 1974.



### New England Nuclear Biomedical Assay Laboratories

549 Albany Street, Boston, Massachusetts 02118  
Customer Service 617-482-9595

Canada: NEN Canada Ltd., Dorval, Quebec, H9P-1B3,  
Tel: (514) 636-4971, Telex: 05-821808  
Europe: NEN Chemicals GmbH, D6072 Dreieichenhain,  
W. Germany, Siemensstrasse 1. Tel: Langen (06103) 85035

# What's General Electric doing in nuclear medicine?



# EXPAND

Previously, General Electric's nuclear medicine line included a Maxiscan™ 2-probe whole body scanner, and a Videodisplay processing unit. Both products are backed by a knowledgeable sales/service group, large in number, nearby when needed.

Now, to meet the growing demands of nuclear medicine, General Electric has acquired the rights to the nuclear medicine product line of Nuclear Data, Inc.

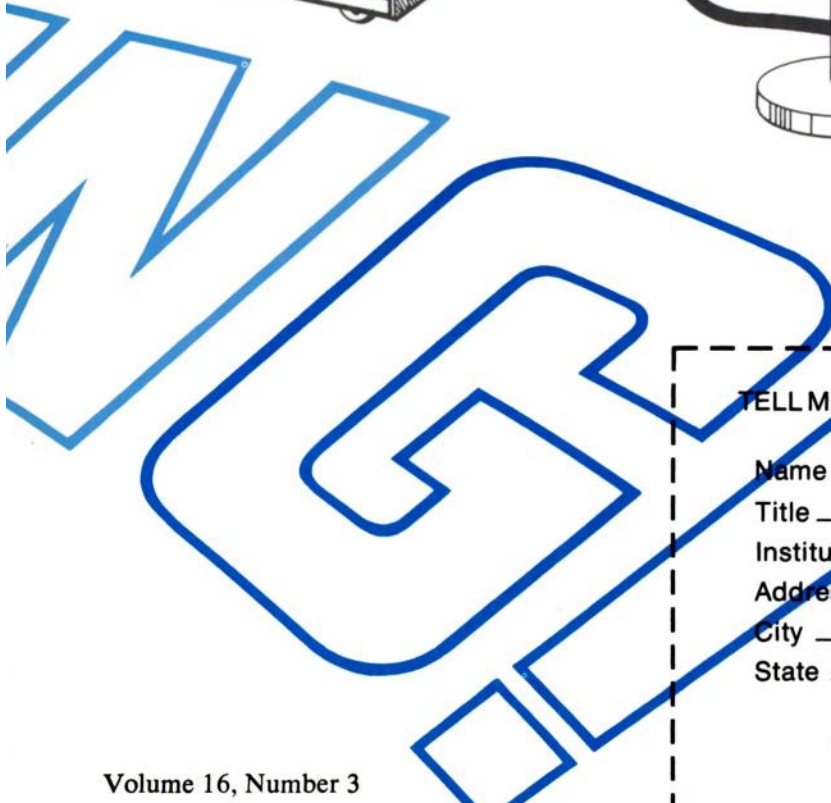
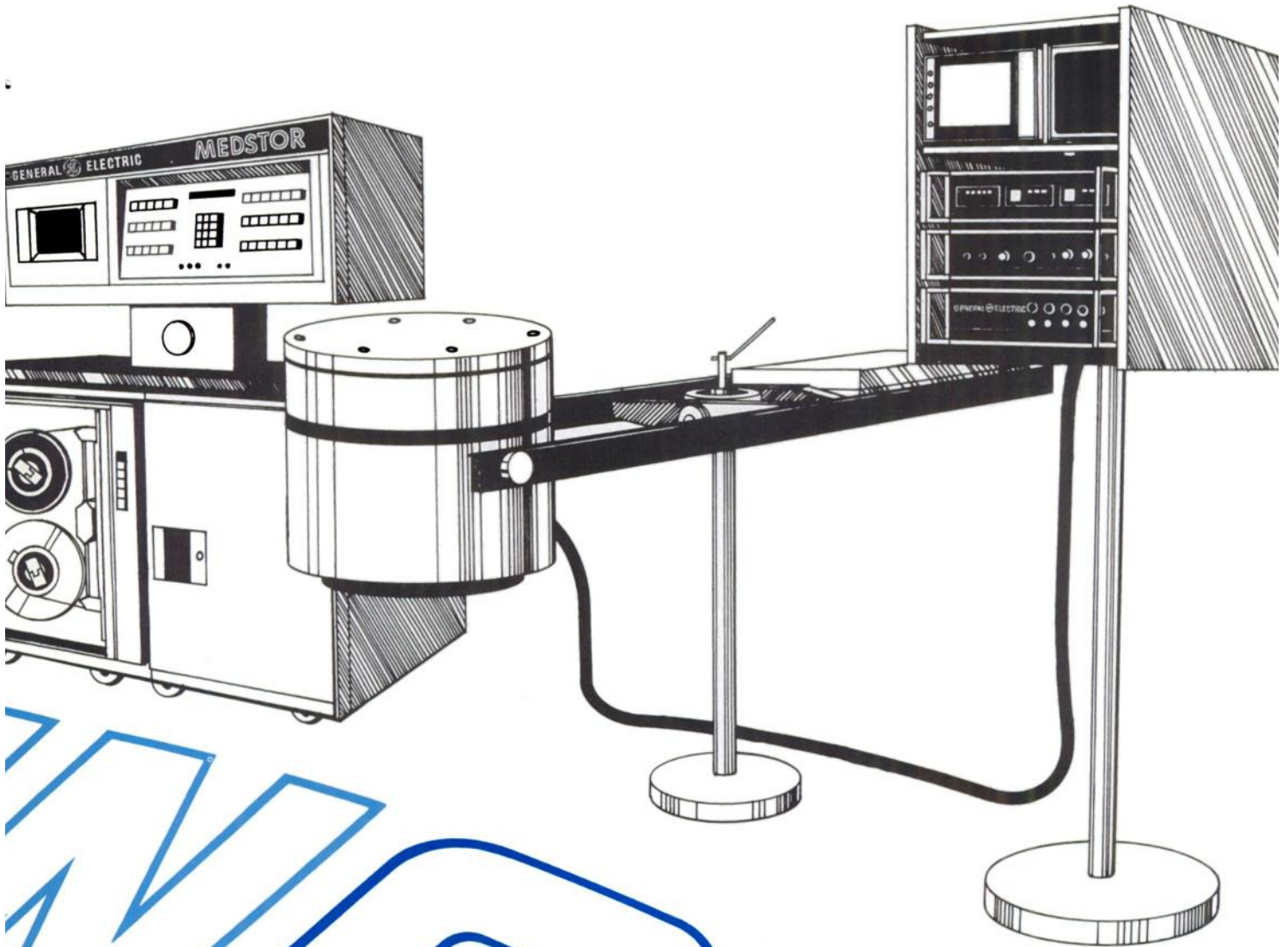
These products have a proven track record. Innovative scintillation cameras (PortaCamera, RadiCamera II)

with unrivaled performance and remarkable portability. First and second generation computerized systems (Med Stor, Med II) specifically designed for nuclear medicine diagnostic tests. And ancillary equipment, such as a whole body imager attachment.

So now you get nuclear medicine capability second to none. Your General Electric representative has full details. Get in touch. Look for the commitment behind the equipment.

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**GENERAL**  **ELECTRIC**



TELL ME about GE's expanded commitment to nuclear medicine

Name \_\_\_\_\_

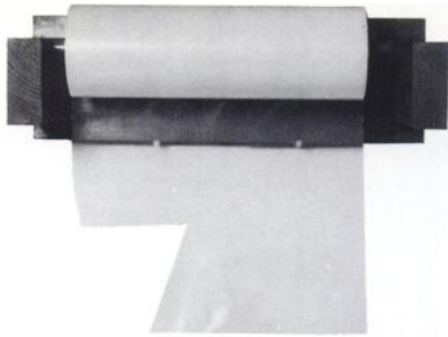
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City \_\_\_\_\_

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**COLLIMATOR PROTECTORS**  
**Model CP-224**

These disposable plastic sheets are designed to keep the face of scintillation camera collimators from becoming contaminated.

The sheets come in rolls of 300 with perforations for easy separation. Simply unroll the sheet, tear at the perforation and apply to the collimator face. The adhesive backing makes application quick and easy. When the sheet becomes contaminated, peel it off, discard and apply a new one. Protectors are so inexpensive that a new one can be used for each patient. Each sheet is 12" x 12".

**Model CP-224 (Roll of 300 Protectors) \$50.00**



**SYRINGE HOLDER**  
**Model SH-277**

This holder is for temporary storage or for transport of single syringes containing radiopharmaceuticals. Syringes from 2 cc. to 20 cc. capacity fit in the 7/8" i.d. holder. The lead wall is 3/8" thick, and the inside depth is 5 3/4".

**Model SH-277**  
**\$14.00**



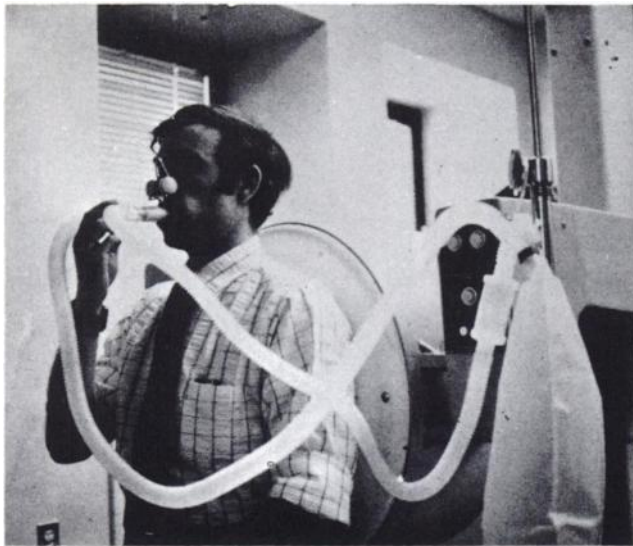
**SYRINGE CARRIER**  
**Model SC-722**

Syringes containing radiopharmaceuticals can be safely stored and transported in the **Model SC-722** lead lined steel Syringe Carrier. Several syringes can be held at one time, depending upon syringe size.

**Specifications**

Dimensions: Inside—7 1/2" long x 2 1/2" high x 2 1/4" deep. Wall Thickness: 1/8" lead all over. Finish: Gold invertex. Weight: 7 pounds.

**Model SC-722** **\$37.50**



**DISPOSABLE XENON-133**  
**REBREATHING SYSTEM**  
**Model Xe-103**

- Disposable combination inhalation and trap system.
- Inexpensive, easy to use.
- No sterilization of mouthpiece required.

**Model DX-133**

**\$11.95**



**XENON-133**  
**GAS TRAP**  
**Model Xe-102**

- Eight charcoal chambers provide efficient xenon removal from expired air.
- Ideal Alternate to expensive exhaust systems
- Totally shielded
- Fifteen minute washout capacity per study
- Removes 98+% of all xenon exhaled

**SPECIFICATIONS:** 20" wide by 18" deep by 45" high. **Weight** — 150 pounds. **Number of chambers** — 8. **Power requirements** — 115V. 60 Hz, AC.

**Model XE-102** complete with water trap/adaptor plexiglass storage cover and hose — **PRICE: \$895.00.**

• All prices F.O.B. Plainview, N.Y.



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## <sup>125</sup>I Folate Radioassay Kit

## <sup>57</sup>Co Vitamin B<sub>12</sub> Radioassay Kit



Introducing another first — Clinical Assays GAMMA LABELED FOLATE and VITAMIN B<sub>12</sub> radioassay kits for the determination of the etiologic diagnosis of megaloblastic anemia and nutritional deficiencies.

Fast — Accurate — Reproducible —

Maximum sensitivity in the diagnostic range below 6ng/ml for Folate and 400 pg/ml for Vitamin B<sub>12</sub>.

Denaturation of the buffered samples at 100°C prior to assay eliminates the need for running individual patient "blanks"(1). Pipettings, counting time and calculations are cut in half.

A new, improved <sup>3</sup>H Folate radioassay kit which utilizes the buffered sample denaturation step is also available. Once again, pipettings, counting time and calculations are halved.

#### Other kits available:

GammaCoat Digoxin ( <sup>125</sup> I)	Digoxin ( <sup>3</sup> H)
GammaCoat Digitoxin ( <sup>125</sup> I)	Digitoxin ( <sup>3</sup> H)
GammaCoat Cortisol ( <sup>125</sup> I)	Cortisol ( <sup>3</sup> H)
GammaCoat Renin Activity ( <sup>125</sup> I)	Prostaglandins ( <sup>3</sup> H)



For Full Details Contact:

# Clinical Assays, Inc.

237 Binney Street • Cambridge, Mass. 02142  
(617) 492-2526

References: 1) Dunn, R. T.; Foster, L. B.;  
Clin. Chem. 19, No. 10, 1101, 1973.



# Thyopac<sup>\*</sup>-5

## From one simple test, two important results.

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

- two independent results from one test
- flexibility of choice: 3 assay sequences
- samples withdrawn at equilibrium
- independent of time and temperature

**Thyopac<sup>\*</sup>-5**  
a logical extension to  
thyroid function testing



**The Radiochemical Centre  
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The Radiochemical Centre Limited, Amersham, England.  
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2451 \*Trade Mark



**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.  
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Phone 312-298-6600

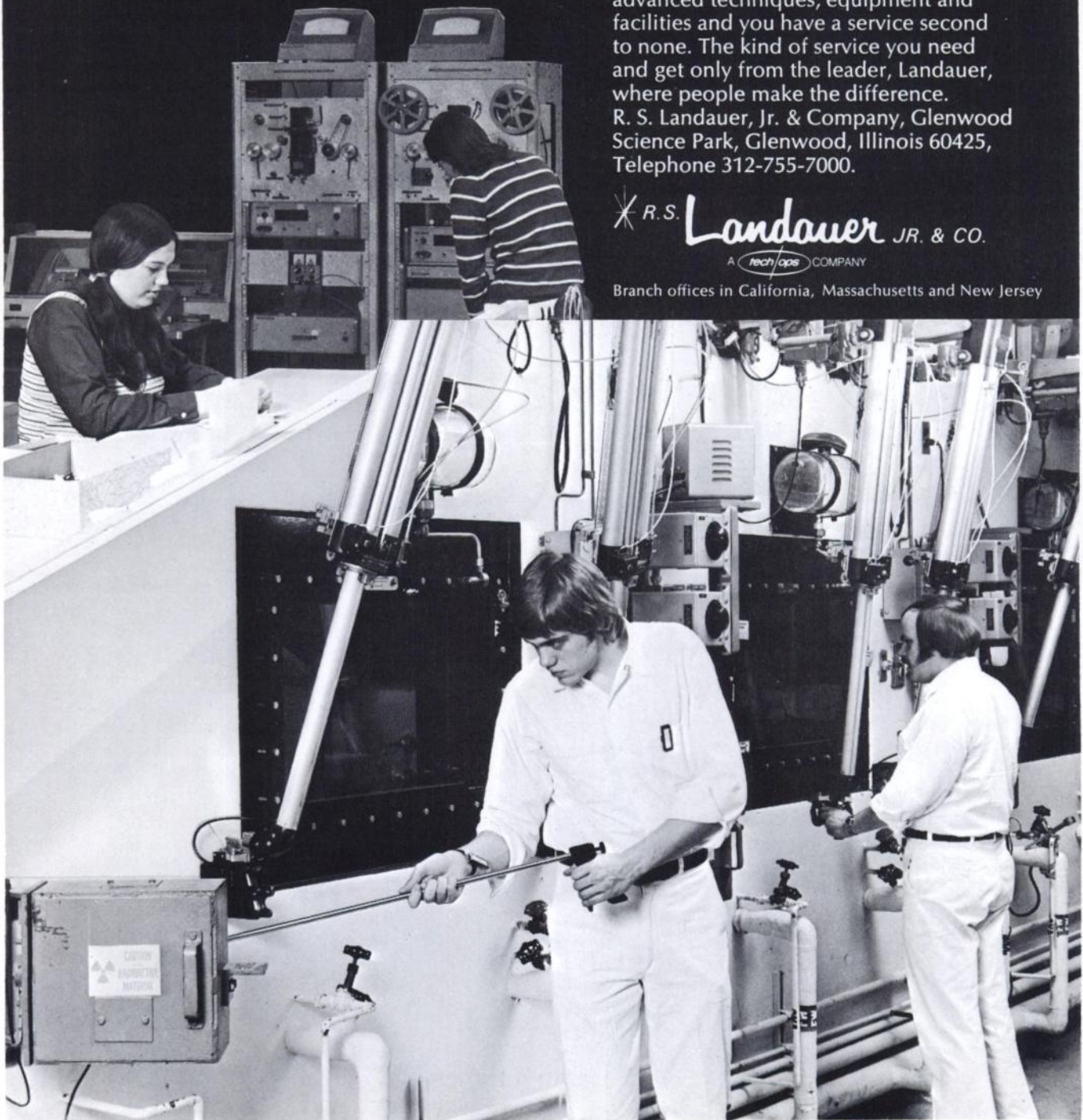
# People make our personnel dosimetry better

Truly concerned people make the difference. Unusual people, the people at Landauer, take a personal interest in protecting your people who wear our dosimeters. This attitude — thinking of badges not as badges but as people — is a part of what makes Landauer the world's leader in dependable dosimetry services. Add to that the latest in Gardray<sup>®</sup> advanced techniques, equipment and facilities and you have a service second to none. The kind of service you need and get only from the leader, Landauer, where people make the difference.

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# Dependable Radiopharmaceuticals



**DIPHOSPHONATE 10 VIAL KIT**

## Kits

All kits contain 10 vials—10cc each. They have long shelf life and are simple to prepare. Available from stock for immediate shipment.

- $^{99m}\text{Tc}$  DIPHOSPHONATE-TIN
- $^{99m}\text{Tc}$  POLYPHOSPHATE-TIN
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## Ready-to-use

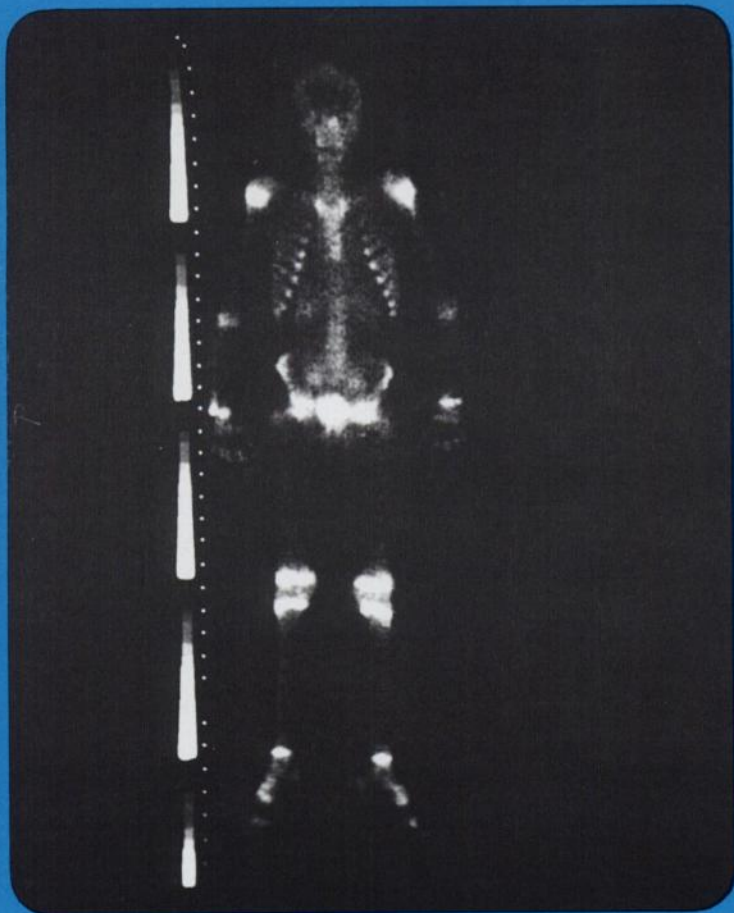
- Gallium-67 CITRATE
- Indium-111 DTPA
- Indium-111 CHLORIDE
- Xenon-133 IN SALINE
- Xenon-133 IN GAS PHASE
- Selenomethionine (Se-75)



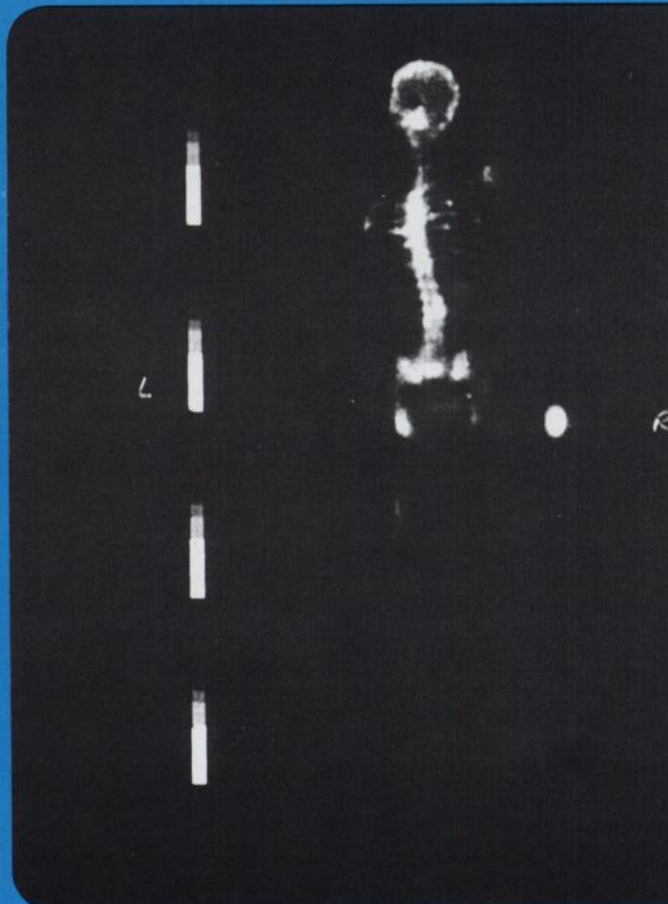
**diagnostic isotopes incorporated**

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

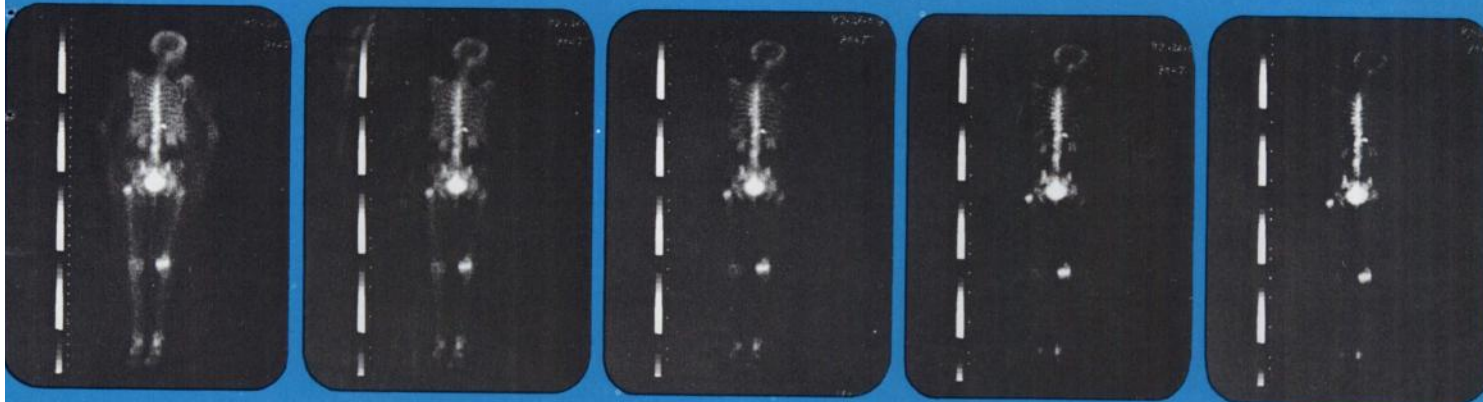


BONE IMAGE OF 13-YEAR-OLD BOY, ANTERIOR.  
SCANNING AGENT =  $^{99m}\text{Tc}$ -POLYPHOSPHATE.  
LENGTH OF SCAN = 160 CENTIMETERS.  
TIME OF SCAN = 16 MINUTES.  
ID AT STERNUM = 416 CTS/CM<sup>2</sup>.



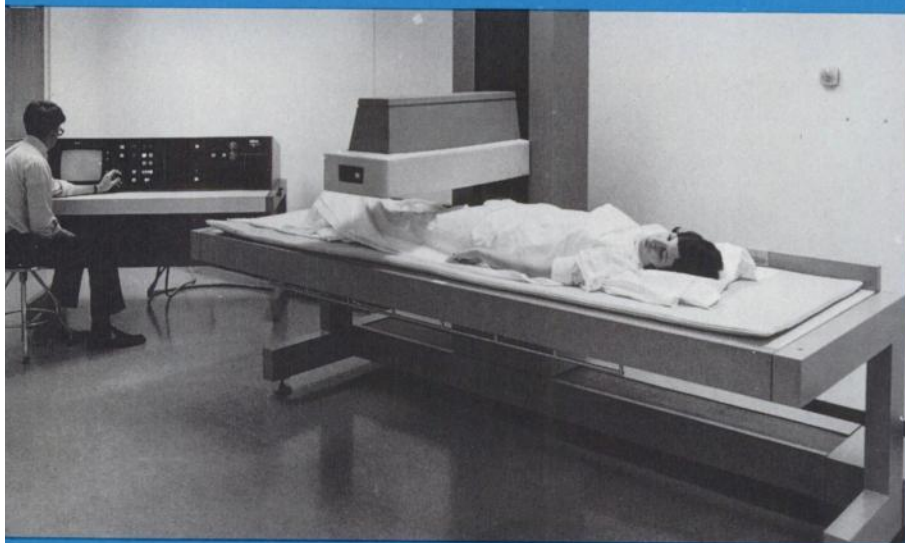
BONE IMAGE OF 56-YEAR-OLD WOMAN, POSTERIOR.  
SCANNING AGENT =  $^{99m}\text{Tc}$ -PYROPHOSPHATE.  
LENGTH OF SCAN = 160 CENTIMETERS.  
TIME OF SCAN = 16 MINUTES.  
ID AT CERVICAL SPINE = 552 CTS/CM<sup>2</sup>.

# ...AGAIN, AND AGAIN, AND AGAIN



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

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



CLEON 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.

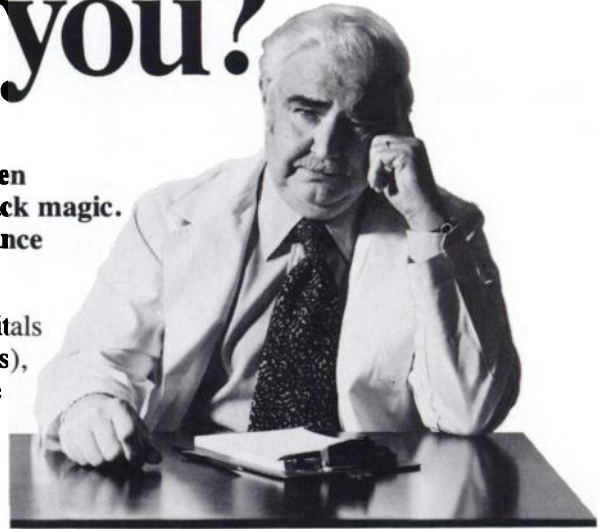
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CORPORATION

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.



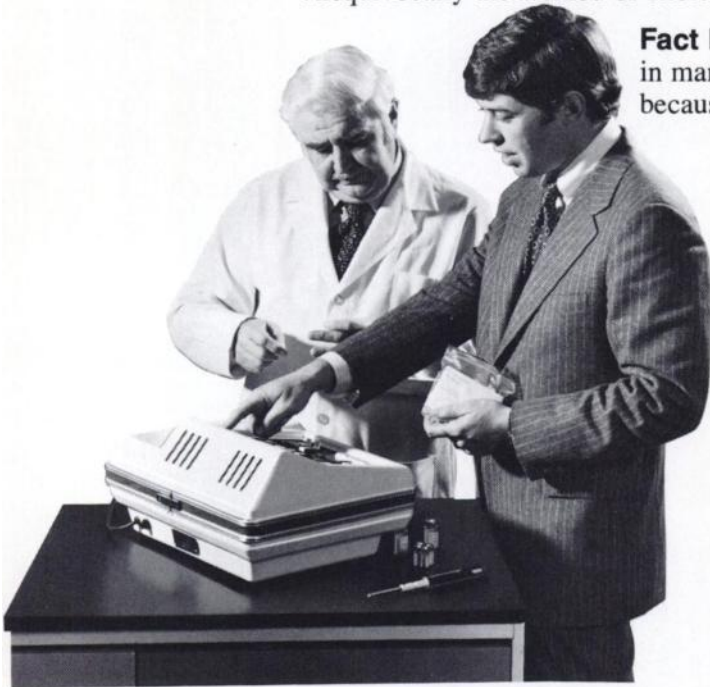
**Fact No.2** In five years, RIA will become commonplace in many more hospitals, including community hospitals, because of its outstanding sensitivity and specificity.

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?

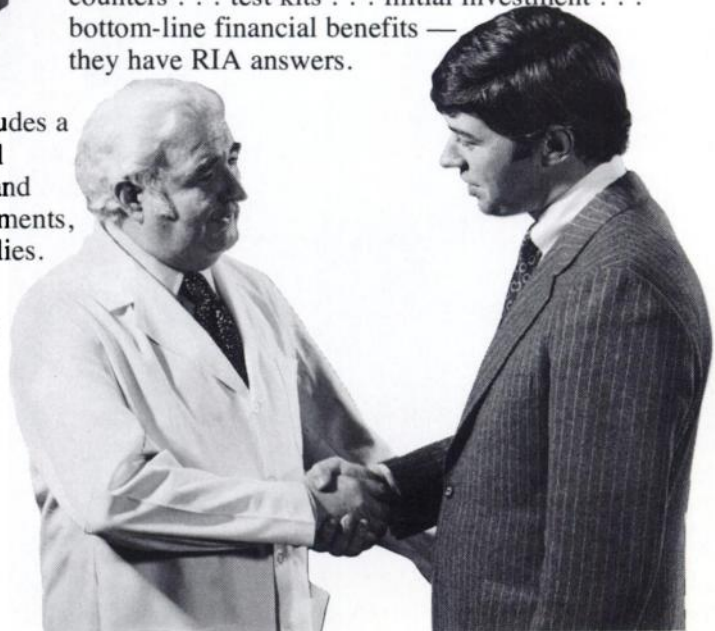
**Fact No.4** Yes, RIA does use radioactive material — but in low levels. It's not to be feared just understood.

**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.

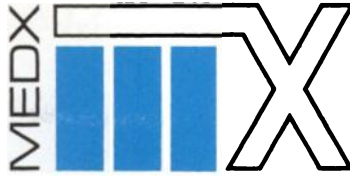


**Fact No.6** The Fisher RIA program includes a firm commitment: Fisher RIA experts will constantly survey the entire marketplace and make available to you the best RIA instruments, equipment, chemicals, test kits, and supplies. No other company can offer you more.

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



**Fisher Scientific Company**  
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Pittsburgh, Pennsylvania 15219



# MEDX Reconditioned Equipment: Better than new?

We think so . . . and the reliable performance of our Medx reconditioned gamma cameras and scanners proves us right.

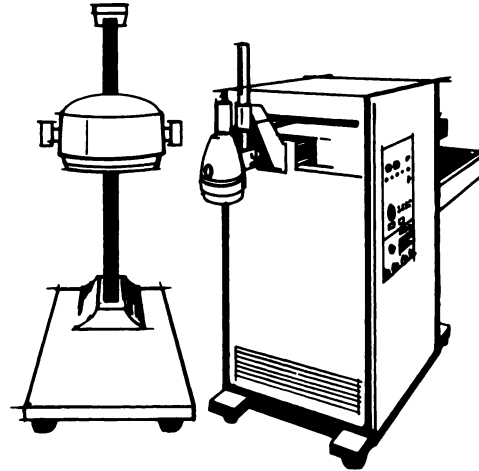
During the past year the need for warranty maintenance on Medx reconditioned cameras has been about **half** that usually required on new systems. This is well below even our own expectations.

As for **performance** — every Medx reconditioned system is guaranteed to equal or exceed the original manufacturer's specifications.

As for **appearance** — every Medx system is totally refinished and new-like in appearance.

As for **back-up** — every Medx scanner and camera has a full one-year warranty identical to that furnished with new equipment.

It's all done through expert reconditioning in our brand new 10,000 square foot factory. There every Medx system undergoes thorough testing, inspection, and repair before shipment. Medx technicians pay particular attention to critical performance-oriented components like crystals, phototubes, CRT's, power supplies, and scanner mechanics. Anything that doesn't



meet new equipment standards is replaced. Then Medx professionals install your system and train your personnel.

**The clincher** is the price — usually about **half to two-thirds** that of comparable new systems!

Let's get together to talk about special Medx programs to fit your special needs. Use the coupon or call us collect at **(312) 991-0660**.

## MEDX inc.

501 South Vermont Street  
Palatine, Illinois 60067



Please contact us regarding our immediate needs.

Please add our name to your mailing list to receive future information.

Our main interest is Cameras Scanners Other Instrumentation \_\_\_\_\_

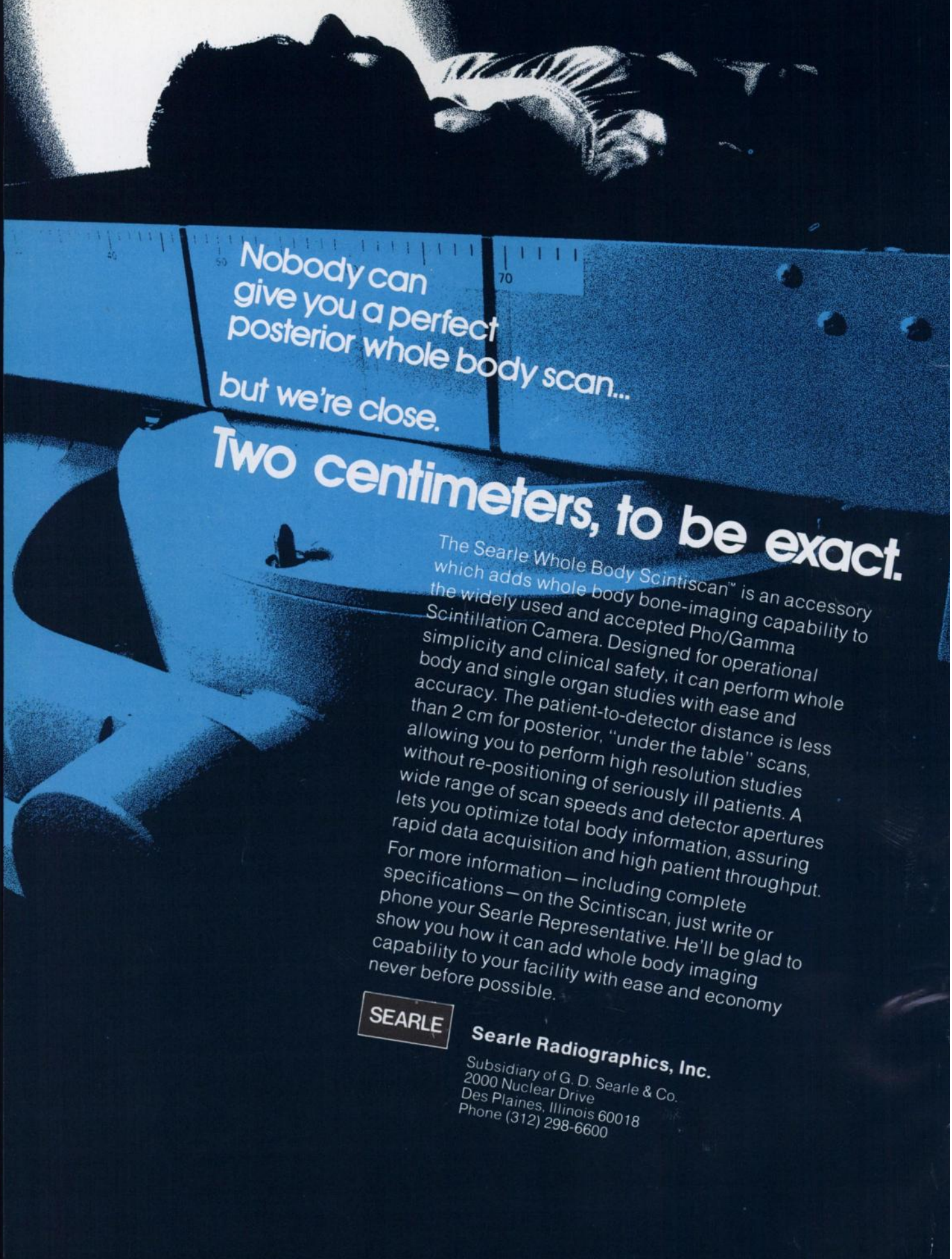
We'd like a trade-in price on \_\_\_\_\_

NAME \_\_\_\_\_ INSTITUTION \_\_\_\_\_

STREET \_\_\_\_\_ PHONE \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

CAMX 2



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.

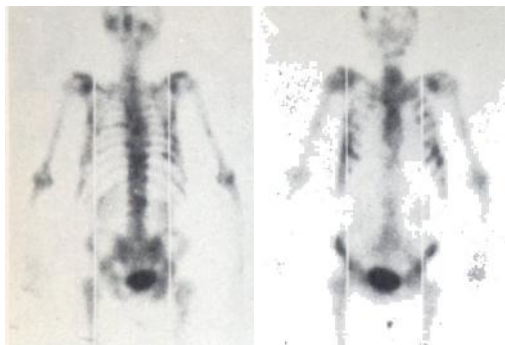
**SEARLE**

**Searle Radiographics, Inc.**

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

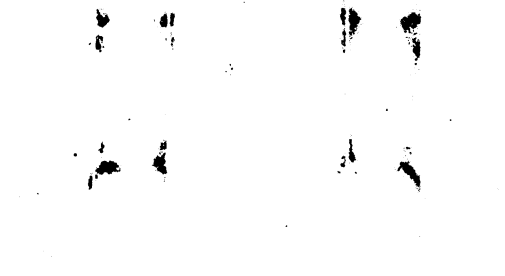


**You depend on a  
bone imaging agent  
for consistent detection  
of skeletal lesions...**



with known carcinoma of the prostate. Note pelvic, skull, rib, sternum and vertebral lesions.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Anterior Count per Time:  
> 1,000,000/30 min  
Posterior Count per Time:  
> 1,000,000/30 min  
Instrument:  
Searle Pho/Gamma® HP camera with whole body table, Microdot Imager® and high-sensitivity collimator  
Scanned:  
3 hours postinjection

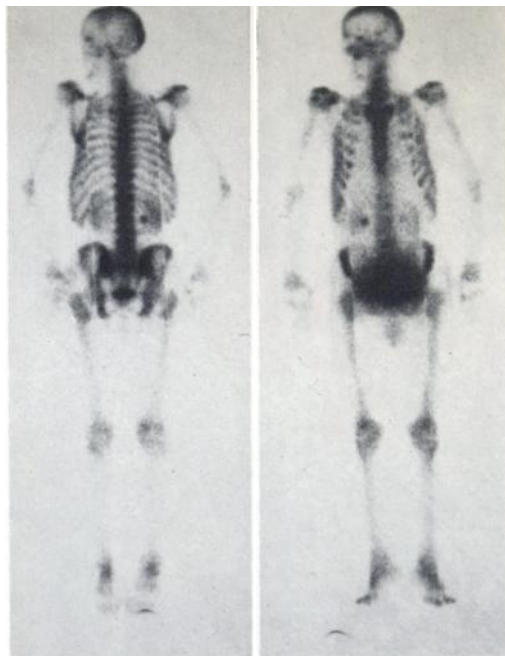


L POSTERIOR R R ANTERIOR L

When selecting a bone scanning agent for your department, there is a single overriding concern: Which will most consistently image the patient's detectable bone lesions?

When labeled with <sup>99m</sup>Tc, the physical and chemical properties of Osteoscan's diphosphonate formula deliver the excellent lesion imaging you need . . . scan after scan, day after day.

- P-C-P molecular bonding assures excellent in vivo stability—to minimize soft tissue uptake.
- Dry mix diphosphonate formulation reduces potential for hydrolysis.
- Formulated to produce consistently high tagging efficiency.



with prostatic carcinoma and no conclusive evidence of metastasis to bone.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Posterior Count per Time:  
636,690/35 min  
Anterior Count per Time:  
613,007/35 min  
Instrument:  
Picker Dynacamera® 2C with Omniview® table and ultrafine collimator  
Scanned:  
4 hours postinjection

L POSTERIOR R R ANTERIOR L

The result:

- Rapid blood clearance
- High target/non-target ratios
- Clear imaging of detectable bone lesions

If you would like further information about Osteoscan's performance benefits or would like to pro Osteoscan's consistent lesion imaging for yours —please call Arnold Austin, Technical Manager Professional Services Division, Procter & Gamb (513) 977-8547.

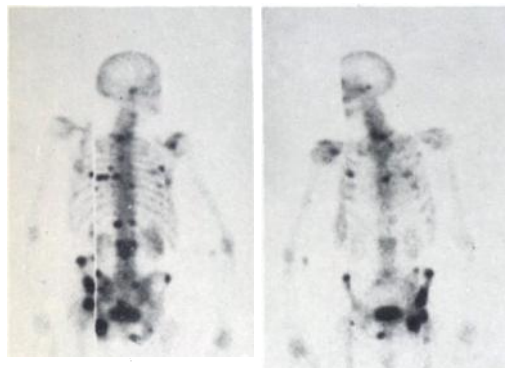
PROCTER & GAMBLE

**OSTEOSCAN®**

(5.9 mg disodium etidronate  
0.16 mg stannous chloride)

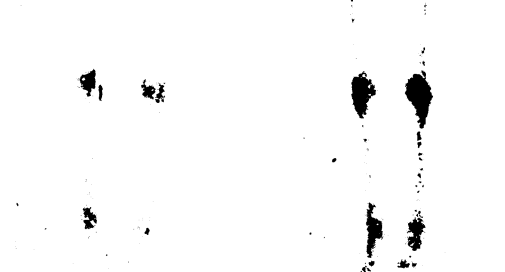
SKELETAL IMAGING AGENT

L POSTERIOR R R ANTERIOR L

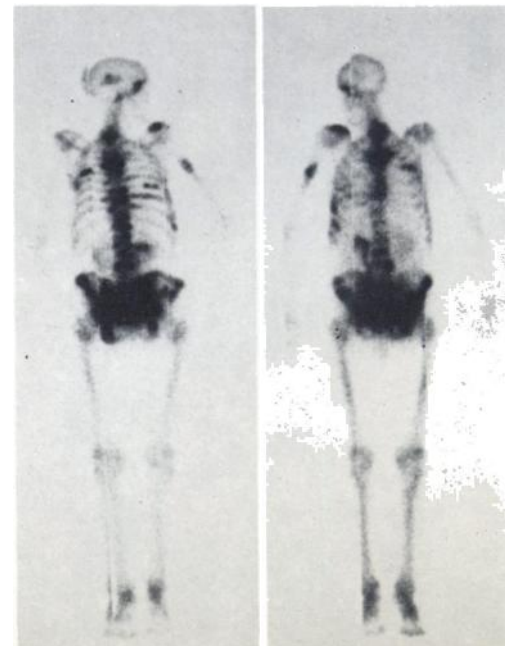


An 82-year-old patient with extensive metastatic bone disease secondary to known carcinoma of the prostate.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Anterior Count per Time:  
561,220/30 min  
Posterior Count per Time:  
631,388/30 min  
Instrument:  
Picker Dynacamera® 2C with Omniview® table and ultrafine collimator  
Scanned:  
4 hours postinjection



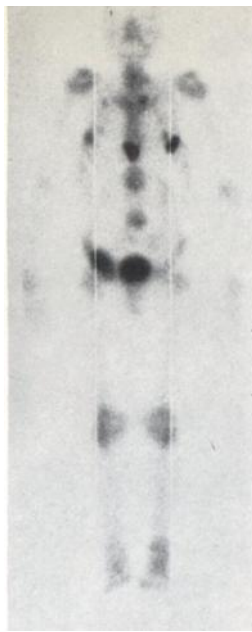
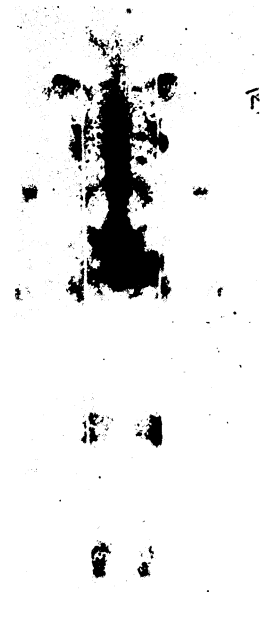
L POSTERIOR R R ANTERIOR L



A 79-year-old male with known prostatic carcinoma metastatic to bone. Multiple lesions are seen throughout skeletal system.

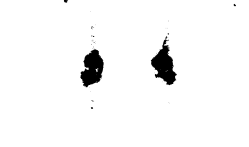
Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Posterior Count per Time:  
621,153/26 min  
Anterior Count per Time:  
649,702/31 min  
Instrument:  
Picker Dynacamera® 2C with Omniview® table and ultrafine collimator  
Scanned:  
4 hours postinjection





with a 41-year history of smoking displays extensive metastatic disease in ribs, vertebral bodies, pelvis, sternum and skull, secondary to known carcinoma of the lung.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Anterior Count per Time:  
> 1,000,000/30 min  
Posterior Count per Time:  
> 1,000,000/30 min  
Instrument:  
Searle Pho/Gamma® HP camera with whole body table, Microdot Imager® and high-sensitivity collimator  
Scanned:  
3 hours postinjection



with previous right radical mastectomy for malignancy, having rib pain. Increased uptake in ribs suggests metastatic disease.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Posterior Count per Time:  
500,361/28 min  
Anterior Count per Time:  
508,462/27 min  
Instrument:  
Picker Dynacamera 2C with Omniview table and ultrafin collimator  
Scanned:  
4 hours postinjection

L POSTERIOR R

R ANTERIOR L

L POSTERIOR R

R ANTERIOR L

# OSTEOSCAN® consistently delivers:

- Clear, sharp images
- High-quality lesion detection

See following page for brief summary of package insert.

L POSTERIOR R

R ANTERIOR L

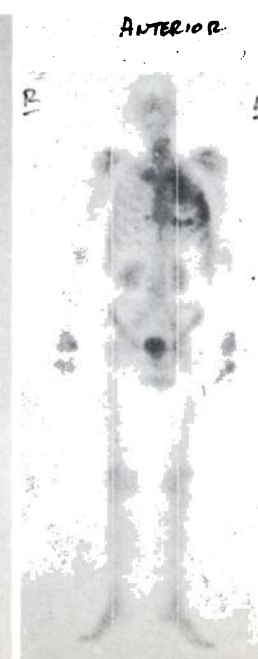


A 43-year-old female with known metastatic disease secondary to carcinoma of the left breast. Swollen left arm is secondary to lymphedema, a result of radical mastectomy. (Note negative defect in region of left breast as a result of prosthesis.) Metastatic disease clearly visualized in vertebral bodies and ribs. Uptake at elbow is extravasation at injection site.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Anterior Count per Time:  
> 1,000,000/30 min  
Posterior Count per Time:  
> 1,000,000/30 min  
Instrument:  
Searle Pho/Gamma® HP camera with whole body table, Microdot Imager® and high-sensitivity collimator  
Scanned:

L POSTERIOR R

R ANTERIOR L



A 61-year-old male following thoracotomy for carcinoma of the left lung. Two rib fractures (anterior view) of unknown etiology. Right thumb uptake (posterior view) secondary to arthritic changes.

Imaging Agent:  
15 mCi  
<sup>99m</sup>Tc-OSTEOSCAN  
Anterior Count per Time:  
> 1,000,000/30 min  
Posterior Count per Time:  
> 1,000,000/30 min  
Instrument:  
Searle Pho/Gamma® HP camera with whole body table, Microdot Imager® and high-sensitivity collimator  
Scanned:  
5 hours postinjection

# OSTEOSCAN... Clear, sharp images for high quality lesion detection... consistently

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.

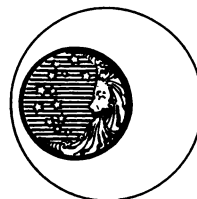
As in the use of any other radioactive material, care should be taken to insure minimum radiation exposure to the patient, consistent with proper patient management, and to insure minimum radiation exposure to occupational workers.

## 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.



PROCTER & GAMBLE

# OSTEOSCAN

(5.9 mg disodium etidronate  
0.16 mg stannous chloride)  
SKELETAL IMAGING AGENT

# CAPINTEC...



## The Largest and Most Reliable



## Family of



## Radioisotope Calibrators!

Proved by thousands  
of hours of  
trouble-free service  
in more than 1,000  
nuclear medicine  
departments  
throughout the world!



### CRC-10<sup>o</sup>

- Push-button isotope selection
- Automatic ranging
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- Highest sensitivity (0.1 uCi resolution)
- 12 atm Argon ionization chamber
- More than 40 isotope calibrations
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- Geometry independence
- Moly-assay capability
- 40 page owners manual

Maintenance contract program (optional) . . . can provide loan equipment during period of service.

Precise reference standards (optional) . . . certified calibration stand-

ards available for routine quality control testing.

Choose from 6 additional members of the Capintec Family featuring — Activity range to 200 curies . . . dose computation . . . Tc-99m concentration recall . . . remote detector operation.

Complete local servicing available in most areas.

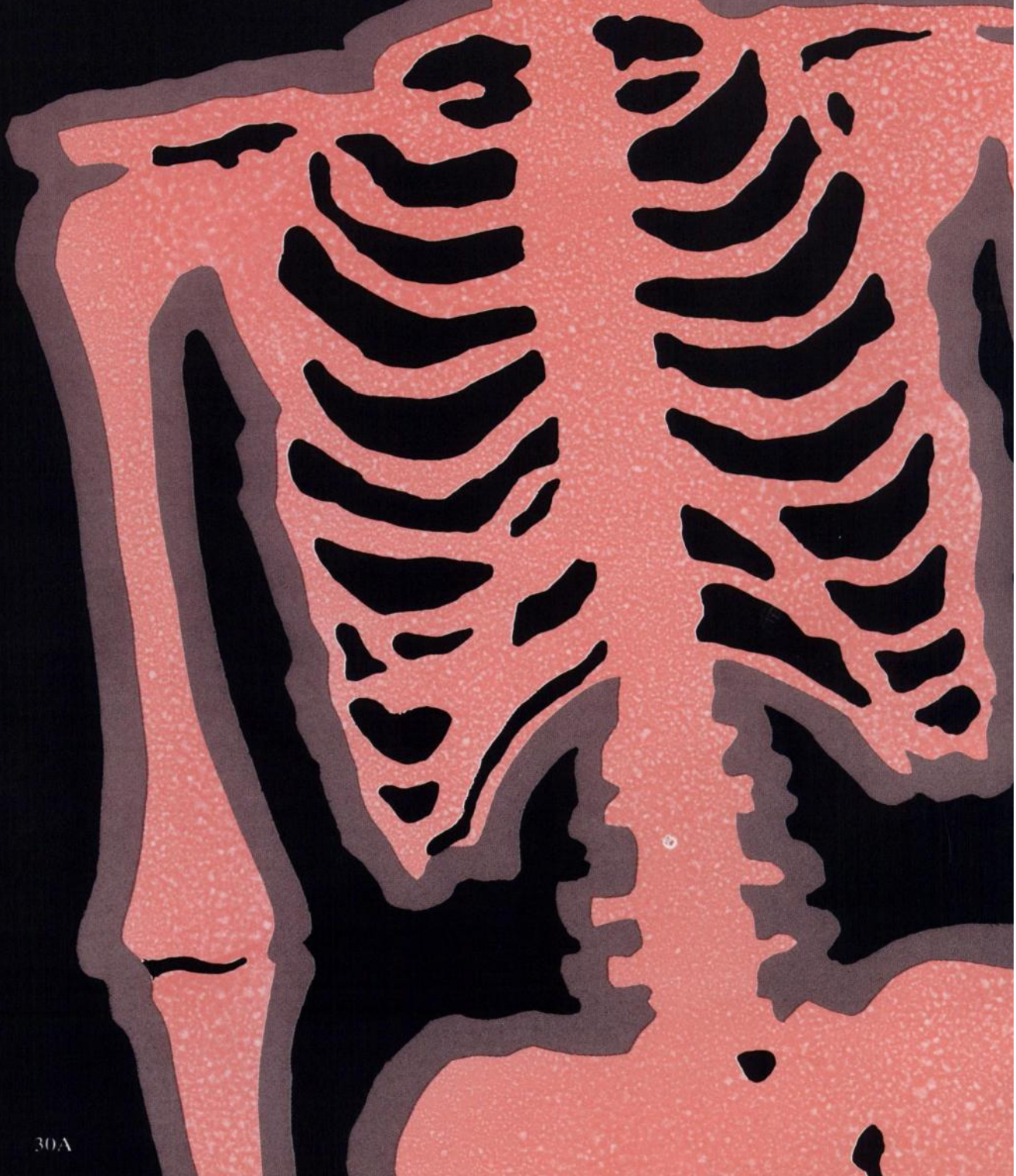


Write for information

**CAPINTEC, INC.**

63 East Sandford Blvd., Mt. Vernon, N.Y. 10550 • 914-664-6600 • Telex. 131445 (Capintec MTV)

**SCANS SHOULD BE SEEN  
- NOT  
BLURRED**

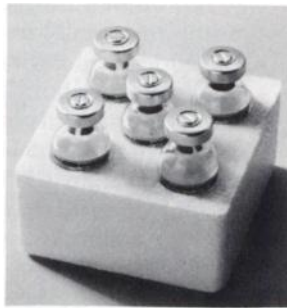


MALLINCKRODT'S NEW

# TechneScan® PYP™ KIT (STANNOUS PYROPHOSPHATE)

A MOST SUITABLE PHOSPHATE  
FOR SUPERIOR BONE IMAGE QUALITY

A superior  
bone  
imaging  
agent  
because:



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

Excerpts from recent literature on stannous pyrophosphate:

"With the rectilinear scanner,  $^{18}\text{F}$  appeared to be the best bone scanning agent. Technetium- $^{99\text{m}}$ -phosphate compounds were favorable for clinical use because of availability and usefulness in studies with the gamma camera. Quality of scan with polyphosphate was most variable.

Sometimes phosphate compounds and  $^{87\text{m}}\text{Sr}$  showed considerable interference with bone scan due to soft-tissue

radioactivity. Diphosphonate might be regarded as the agent of choice because of its low concentration in the soft tissue. *Pyrophosphate appeared to be most favorable agent considering ease of preparation, reproducibility, and quality of scan.*" (1) (Italics added.)

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

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

1. Hosain F, Hosain P, Wagner HN, Dunson GL, Stevenson JS: Comparison of  $^{18}\text{F}$ ,  $^{87\text{m}}\text{Sr}$ , and  $^{99\text{m}}\text{Tc}$ -Labeled Polyphosphate, Diphosphonate, and Pyrophosphate for Bone Scanning. *J Nucl Med* 14: 410, 1973 *Abst.*
2. Ackerhalt RE, Blau M, Bakshi S, Sondel JA: A Comparative Study of Three  $^{99\text{m}}\text{Tc}$ -Labeled Phosphorous Compounds and  $^{18}\text{F}$ -Fluoride for Skeletal Imaging. *J Nucl Med* 14: 375, 1973 *Abst.*
3. Bok B, Perez R, Panneciere C, DiPaola R: Bone Scanning Radiopharmaceuticals: A Comparison of Three Products. *J Nucl Med* 14: 380, 1973 *Abst.*

TechneScan®  
PYP™ KIT  
(STANNOUS PYROPHOSPHATE)



SEE FOLLOWING PAGE FOR PRESCRIBING INFORMATION

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

**TechneScan PYP Tc 99m** is injected intravenously over a 10- to 20-second period. For optimal results, bone imaging should be done 1 to 6 hours following administration. The patient dose should be measured by a suitable radioactivity

# TECHNE SCAN PYP

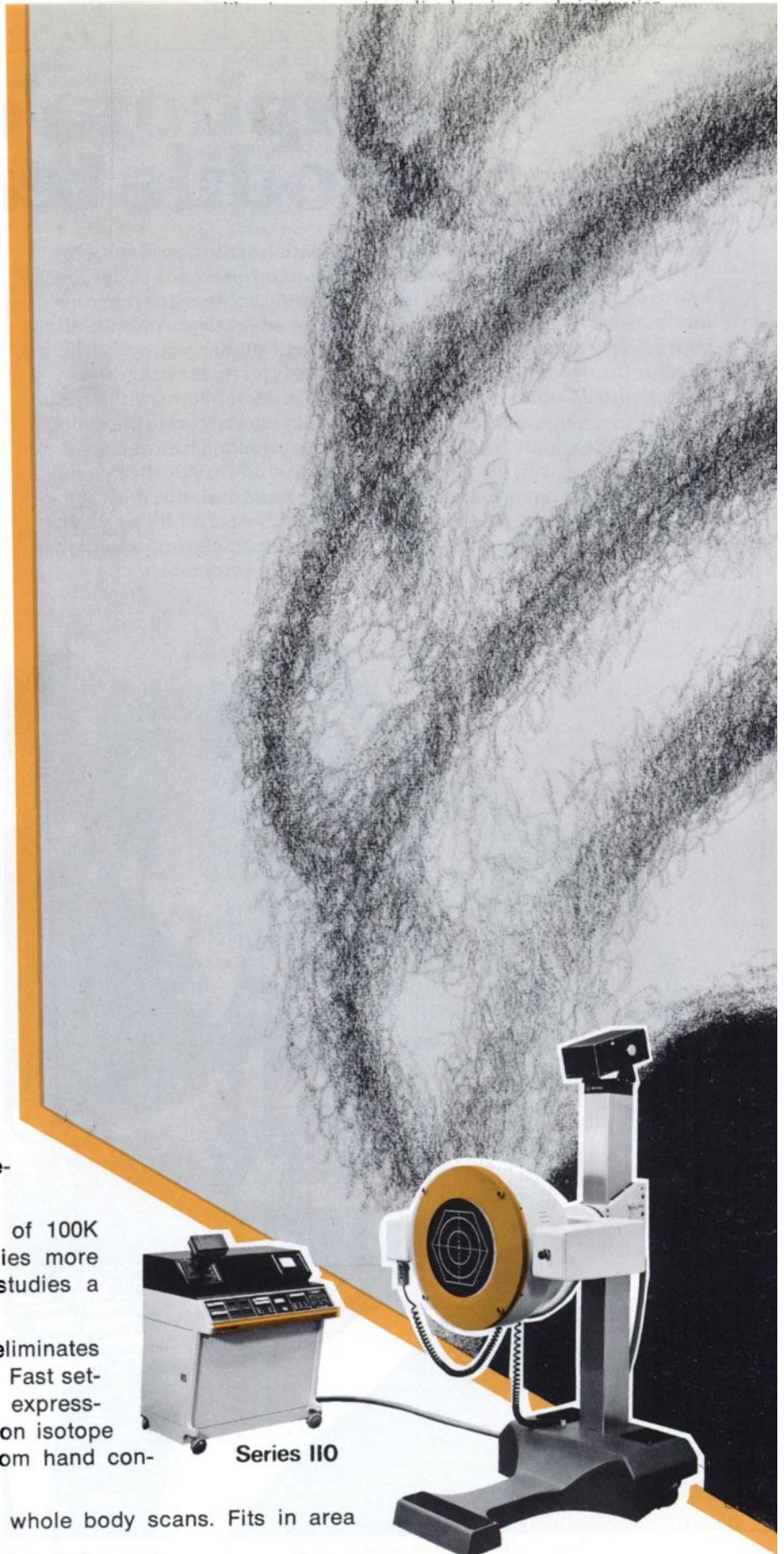
**Field of View.** The useful field is a hexagon that is 14.5" (36.8cm.) across the flats.

**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.)



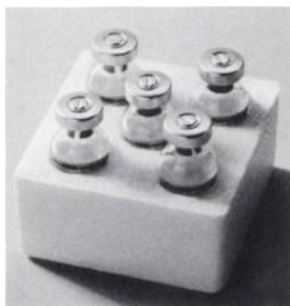
Series 110

MALLINCKRODT'S NEW

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3. Bok B, Perez R, Panneciére C, DiPaola R: Bone Scanning Radiopharmaceuticals: A Comparison of Three Products. *J Nucl Med* 14: 380, 1973 *Abst.*

**TechneScan®  
PYP™ KIT  
(STANNOUS PYROPHOSPHATE)**



SEE FOLLOWING PAGE FOR PRESCRIBING INFORMATION

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

### DESCRIPTION

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

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

### ACTION

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

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

### INDICATIONS

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

### CONTRAINDICATIONS

None.

### WARNINGS

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

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

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

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

The contents of the **TechneScan PYP** reaction vial are intended only for use in the preparation of Technetium Tc 99m Stannous Pyrophosphate and are not to be directly administered to the patient.

Sodium pertechnetate Tc-99m solutions containing an oxidizing agent are *not* suitable for use with the **TechneScan PYP Kit**. The contents of the kit are not radioactive. However, after the sodium pertechnetate Tc-99m is added, adequate shielding of the final preparation must be maintained.

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

### PRECAUTIONS

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

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

### ADVERSE REACTIONS

None.

### DOSAGE AND ADMINISTRATION

The recommended adult dose of **TechneScan PYP Tc 99m** is 5 to 15 millicuries (1 to 14 milligrams of stannous pyrophosphate).

**TechneScan PYP Tc 99m** is injected intravenously over a 10- to 20-second period. For optimal results, bone imaging should be done 1 to 6 hours following administration.

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

### DIRECTIONS FOR PREPARATION

#### Procedural Precautions

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

#### Procedure:

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

### HOW SUPPLIED

Catalog Number—094      **TechneScan PYP Kit**

#### Kit Contains:

- 5—Stannous Pyrophosphate Reaction Vials (Lyophilized) for the preparation of Technetium Tc 99m Stannous Pyrophosphate.
- 5—Pressure-sensitive "Caution—Radioactive Material" labels.
- 5—Radioassay Information String Tags.

#### Reaction Vial Contains:

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

**TechneScan®**  
**PYP™ KIT**

(STANNOUS PYROPHOSPHATE)



Mallinckrodt

NUCLEAR

Mallinckrodt, Inc.  
675 Brown Road  
Hazelwood, Missouri 63042



# epiphora or crocodile tears?

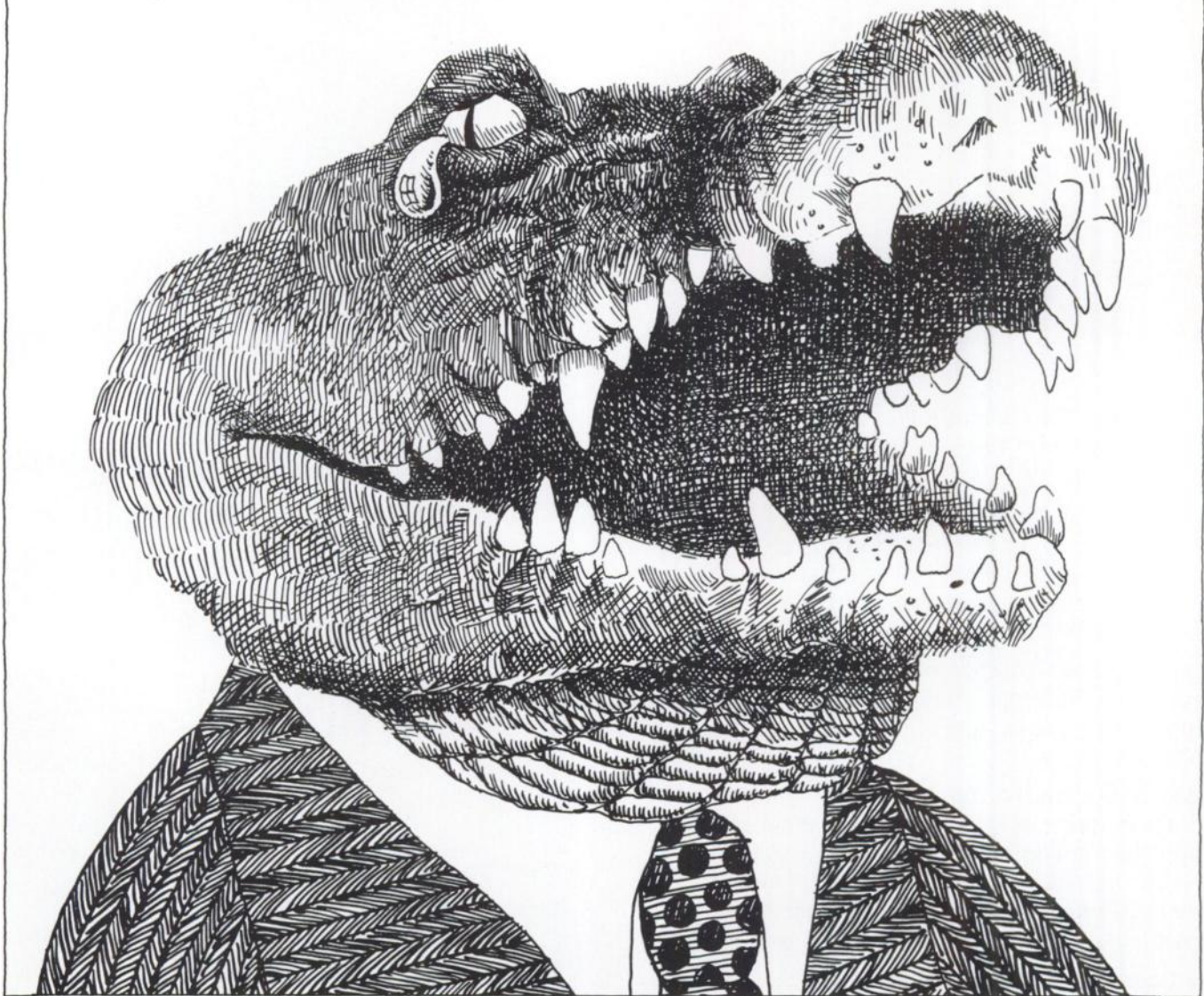
Find out with microscintigraphy, ophthalmology's new diagnostic tool to evaluate the patency of the lacrimal drainage system. All your nuclear medicine department needs is the new System 350 Micropinhole Collimator\* from Dunn Instruments and you're in business. You simply trace a radioactive tear with 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

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

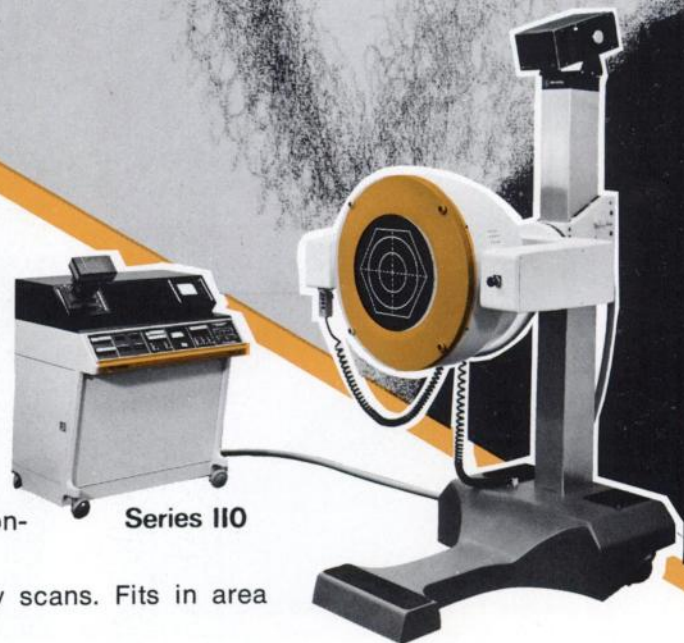
**Speed.** Maximum output count rate of 100K counts/sec. Performs standard studies more rapidly. Helps make fast dynamic studies a standard practice.

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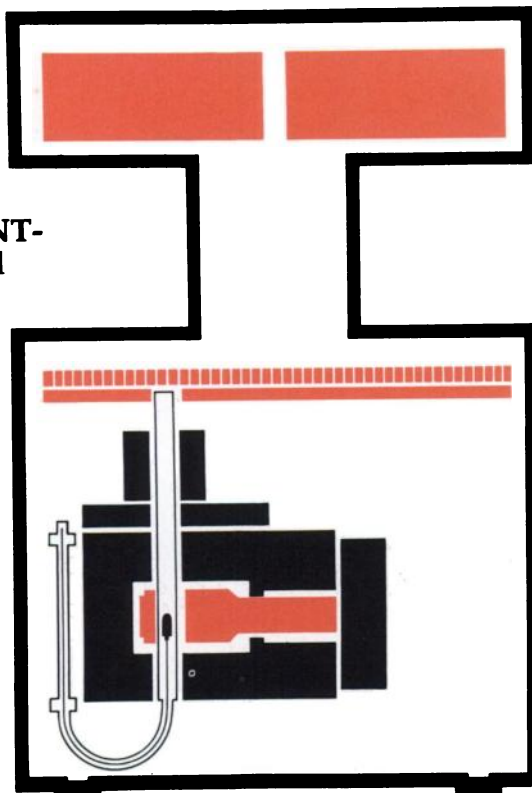
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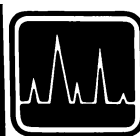
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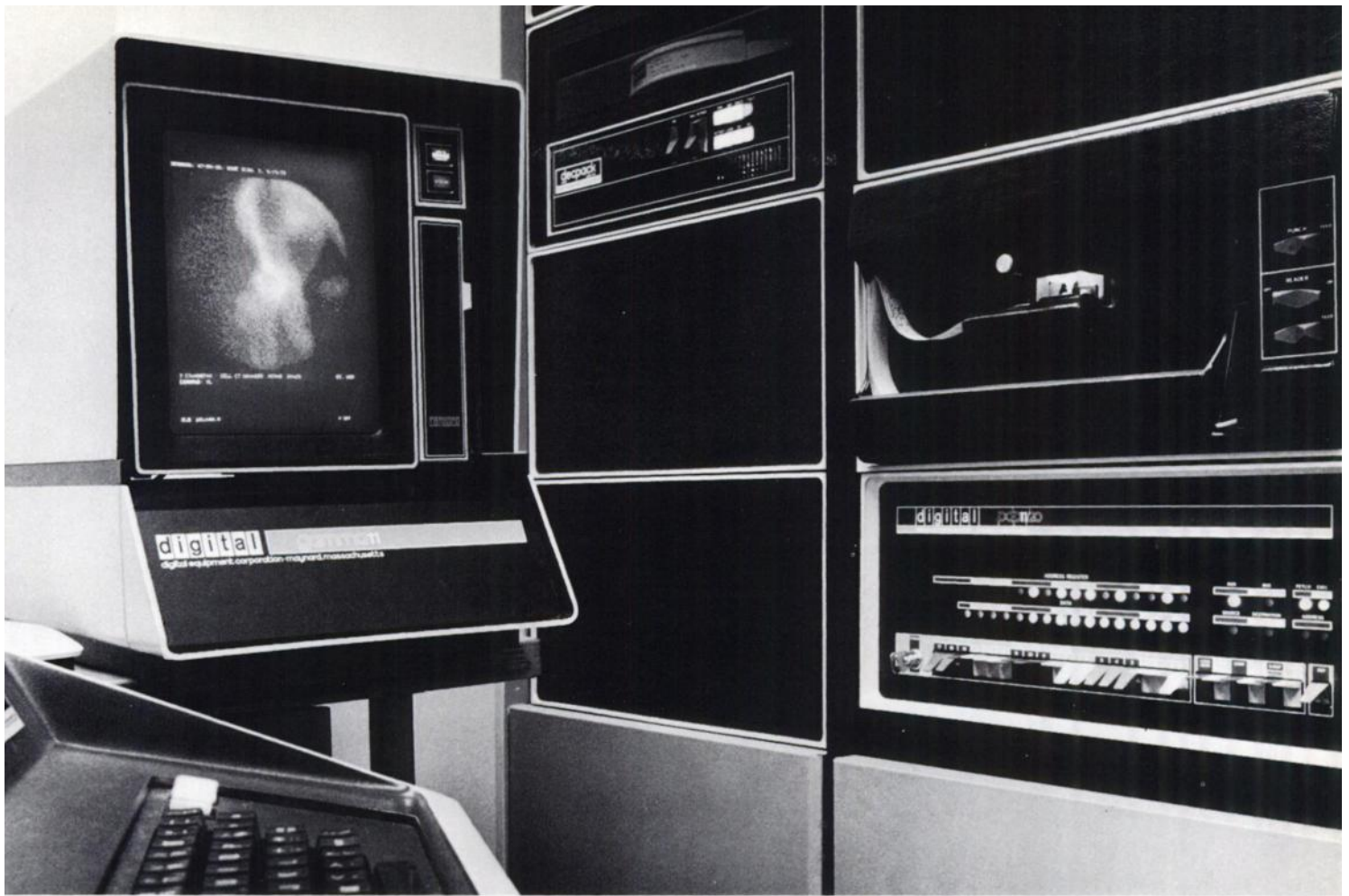
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CAUTION: FROZEN MATERIAL  
Store in Freezer Immediately  
at  $-10^{\circ}\text{C}$  ( $14^{\circ}\text{F}$ ) or Less  
Do Not Allow Contents of Kit to Thaw

**COLD**

# Introducing **TechneScan MAA**

(Aggregated Albumin [Human])

## Lung Scan Kit

with features only a frozen product can give

### Tagging Efficiency...

The tagging efficiency experienced with the **TechneScan MAA Kit** is remarkably consistent, always at or near 100% conversion of pertechnetate to labeled MAA, with little or no loss of the label for up to 24 hours.

### Particle Size Range...

Specifications require that not less than 90% of the particles are 10 to 90 microns in size with not more than 10% below 10 microns, and none greater than 150 microns.

Our investigations indicate that 95% of the **TechneScan MAA** particles are in the 10 to 60 micron range, with 5% less than 10 microns, 0.1% between 60 and 150 microns and none greater than 150 microns. This controlled particle size range, plus the fact that there is no tendency to agglomerate, results in good images of lung perfusion.

### Simplicity...

Preparation of **TechneScan MAA Tc 99m** is extremely simple, requiring only aseptic addition of a pertechnetate solution to the vial. There is no heating, sonication, centrifugation, clean-up or transfer required. The total preparation time is less than 20 minutes.

### Stability...

The expiration date of each **TechneScan MAA Kit** is 6 months after date of manufacture. This 6-month shelf-life permits large inventories to be maintained, reducing the likelihood of depleted supplies.

### Safety...

**TechneScan MAA** is extremely well tolerated. It may be used with reliance on its proven safety, shown by clinical studies. Lung clearance half-time is approximately 6 hours . . . virtually complete urinary excretion occurs in about 24 to 48 hours. And there is to date no evidence of antibody formation.

### Economy...

Up to 6 adult patients can be scintigraphed from the preparation of a single **TechneScan MAA Vial**, helping reduce procedure cost per patient.

If tagging efficiency, particle size range, safety, reliability and convenience are factors in your laboratory, consider the **TechneScan MAA Kit**. It's a step forward in lung scanning. For further information contact your Mallinckrodt representative.

**CONTRAINDICATIONS:** The safety of **TechneScan MAA Tc 99m** in patients with a known right-to-left cardiac shunt has not been established and its use in such patients is contraindicated.

**WARNINGS:** In acute cor pulmonale the administration of aggregated albumin is theoretically hazardous due to the temporary small additional mechanical impediment to pulmonary blood flow. Although not reported with **TechneScan MAA Tc 99m** there are two reports in the literature of deaths occurring after the administration of radioiodinated aggregated albumin as a result of pre-existing primary pulmonary hypertension.<sup>1,2</sup>

The contents of the **TechneScan MAA** reaction vial are intended only for use in the preparation of **TechneScan MAA Tc 99m** and are not to be directly administered to the patient.

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

This radiopharmaceutical preparation 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 radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capacity 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.

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

**ADVERSE REACTIONS:** Although no anaphylactoid reactions have been reported in patients following the administration of **TechneScan MAA Tc 99m**, the possibility should be considered that hypersensitivity reactions may occur rarely in patients who, after the initial administration, receive additional doses a number of weeks after the initial dose.



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<sup>1</sup>Dworkin, H. J.; Smith, J. R. and Bull, F. E.: Reaction after Administration of Macroaggregated Albumin for a Lung Scan. *New England J. Med.*, 275:376, August 18, 1966.

<sup>2</sup>Roberts, H. J.: Fatal hemoptysis in pulmonary embolism probably precipitated by pulmonary scanning—Report of a case and suggested precautions. *Angiology*, 21:270, 1970.

# WHAT'S NOW SQUIBB?

On the current nuclear medicine scene



## MINITEC® (Technetium 99m) Generator

The Technetium 99m Generator using fission product molybdenum to produce technetium 99m. MINITEC is unlike any generator you've ever used—made small to make sense.

### Designed for easy handling

- MINITEC has its own handle for easy lifting, easy carrying and reduced hand exposure
- Weighs only 24½ lbs., less than 5" in diameter, under 8½" high

### Designed for easy elution

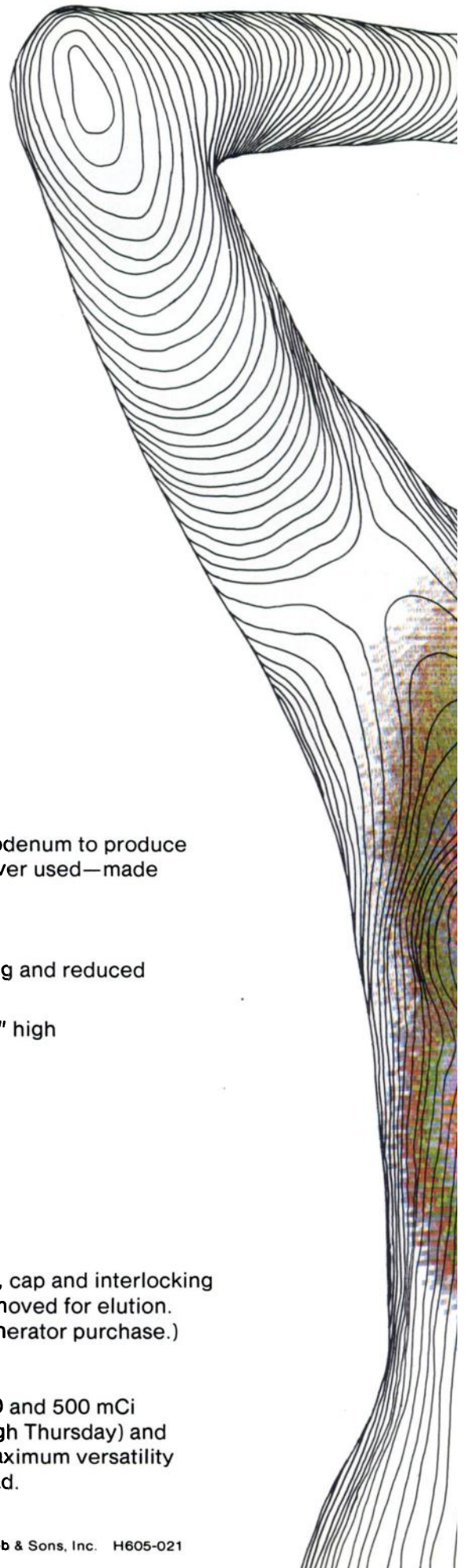
- Sets up in seconds
- Elutes in only 3 minutes after eluent vial has emptied

### Designed for safety

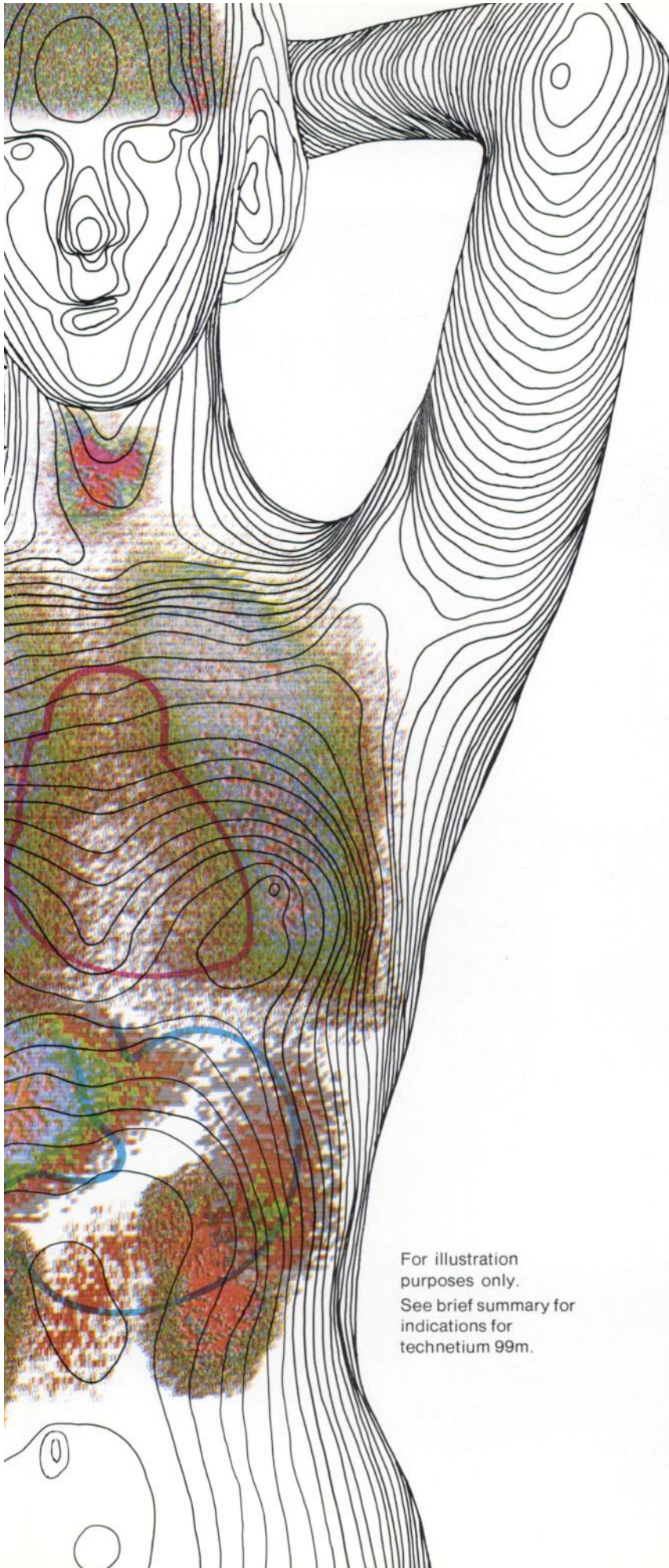
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### Designed for convenience

- MINITEC Generator is available in 50, 100, 200, 300, 400 and 500 mCi potencies. Delivery on Monday AM (precalibrated through Thursday) and Wednesday (precalibrated through Monday) provides maximum versatility to satisfy technetium requirements of your lab's work load.







For illustration purposes only. See brief summary for indications for technetium 99m.

# Minitec<sup>®</sup> (Technetium 99m) Generator

Minitec<sup>®</sup> (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 childbearing 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, 300, 400, and 500 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.

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In technetium-99m generators, Mallinckrodt is the only someone who makes all these.

Because we have a complete line of generators, we can make sure you get the right one for your application, whether you require 50 mCi or 500 mCi. You'll not only get the right technetium generator, you'll get one you can rely on. Every Mallinckrodt Ultra-TechneKow® Generator column is sterilized by autoclaving, and each generator is eluted and tested in our laboratories before shipment.

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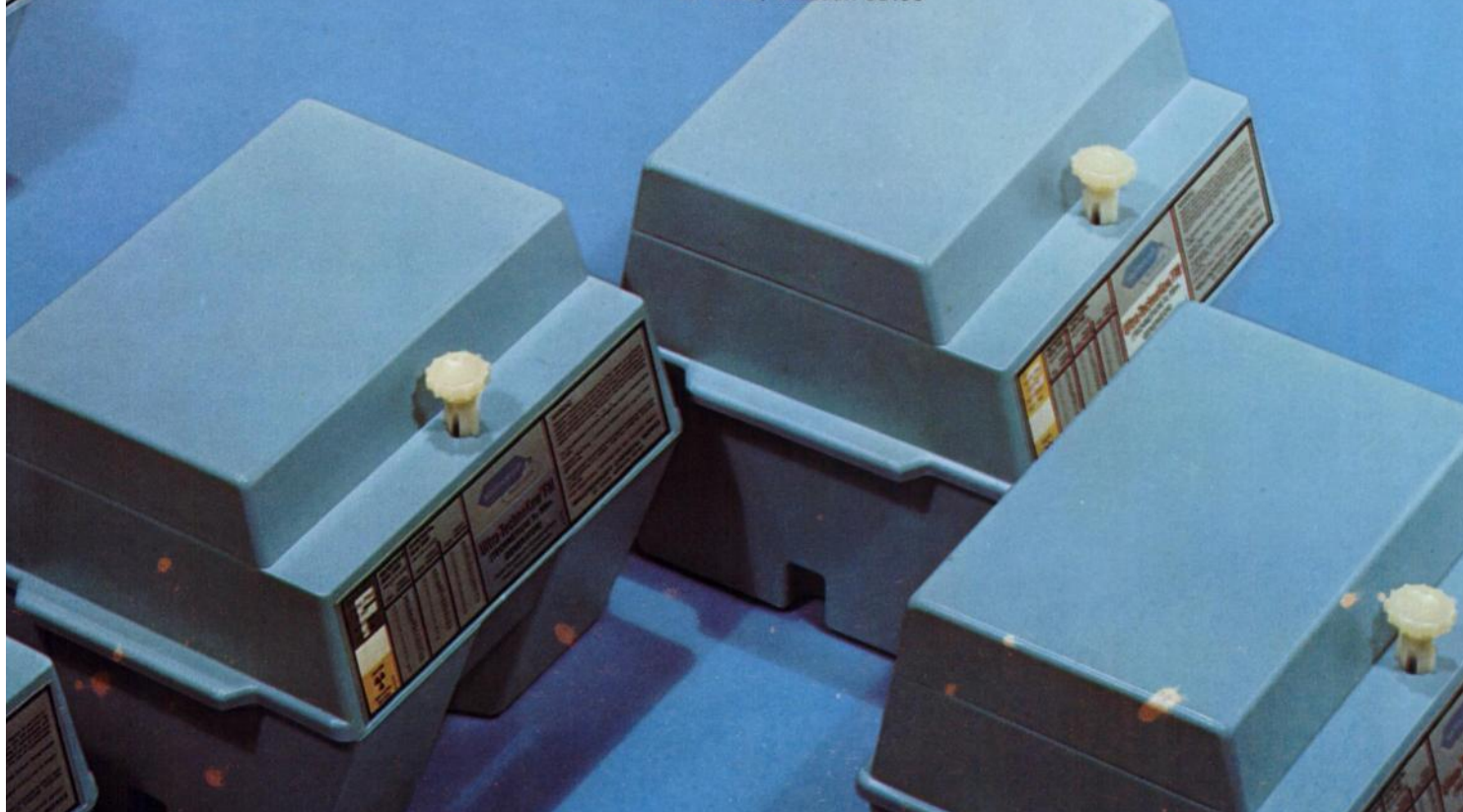
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100 mCi	Cat. No. 007	100 mCi	Cat. No. 101
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200 mCi	Cat. No. 008	300 mCi	Cat. No. 103
300 mCi	Cat. No. 009	400 mCi	Cat. No. 104
400 mCi	Cat. No. 010	500 mCi	Cat. No. 105
500 mCi	Cat. No. 011	150 mCi	Cat. No. 106

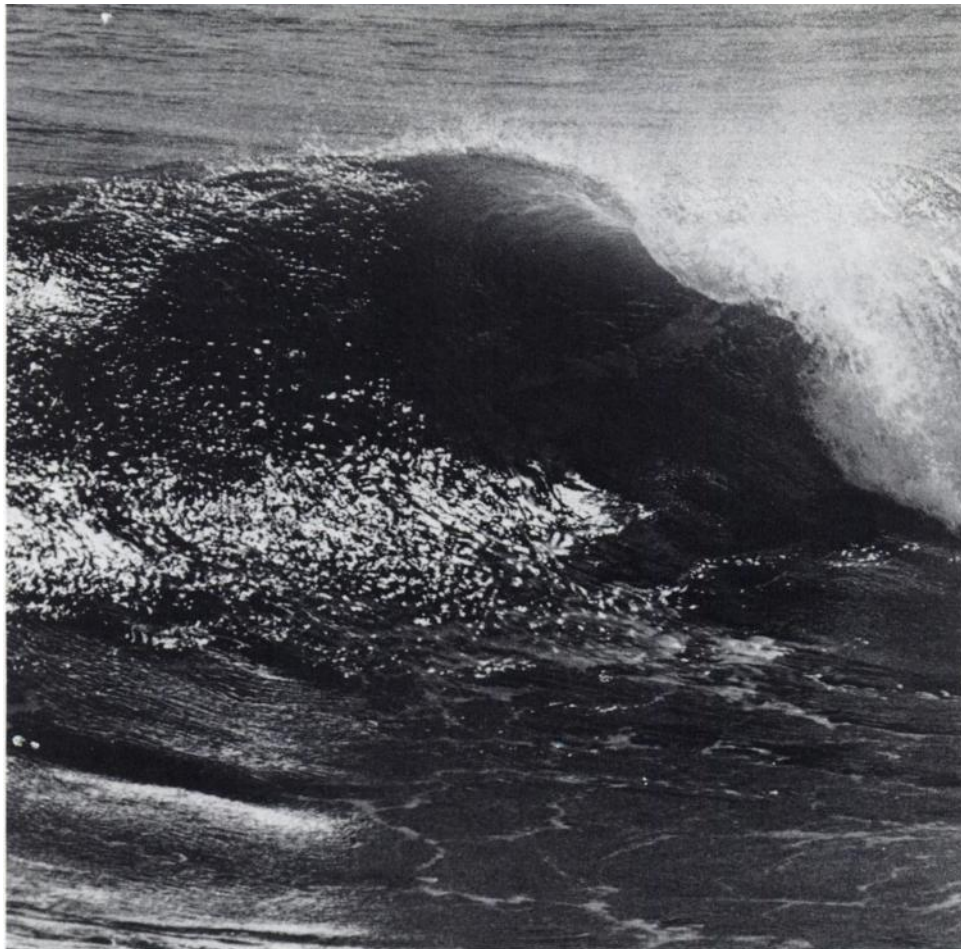
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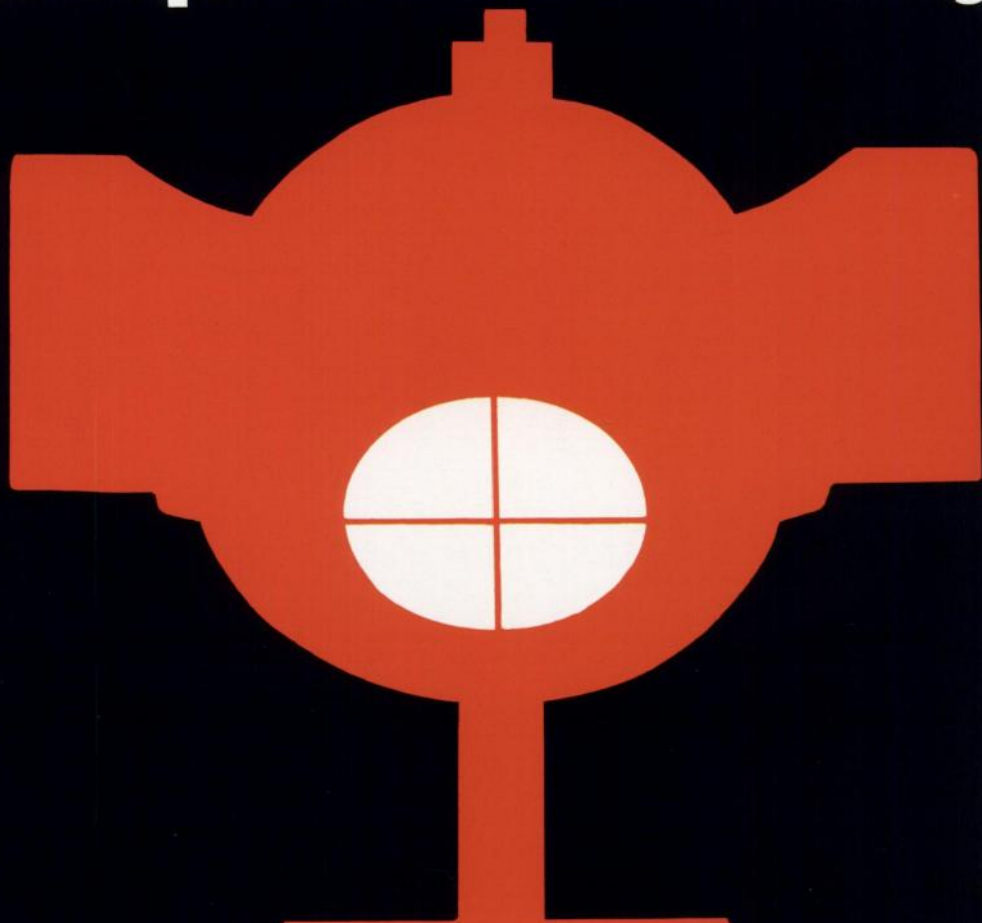
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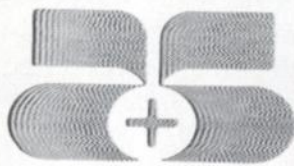


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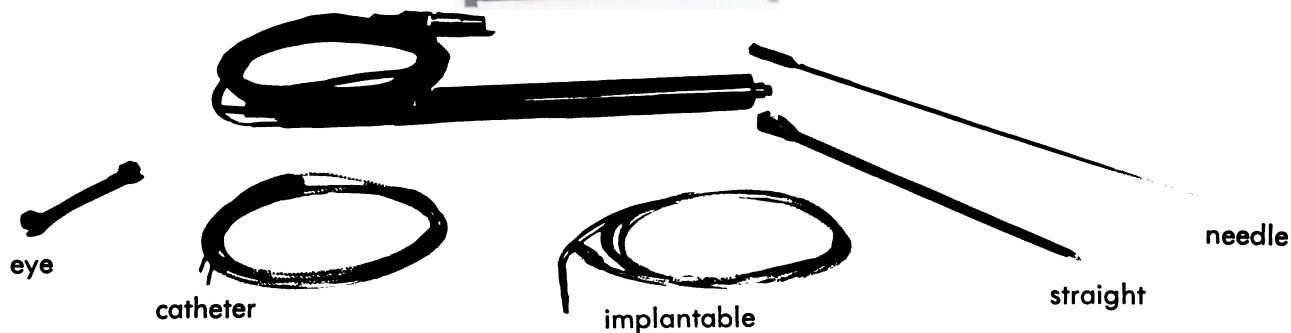
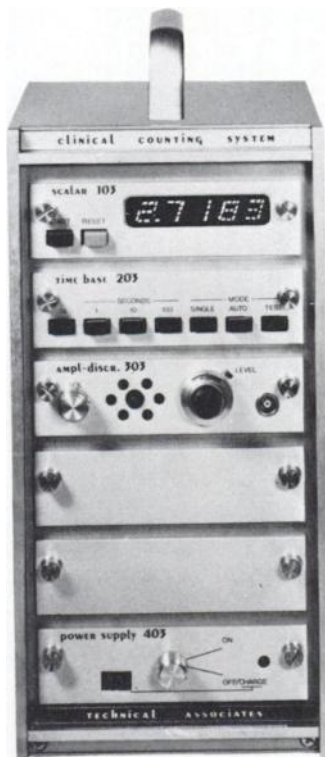
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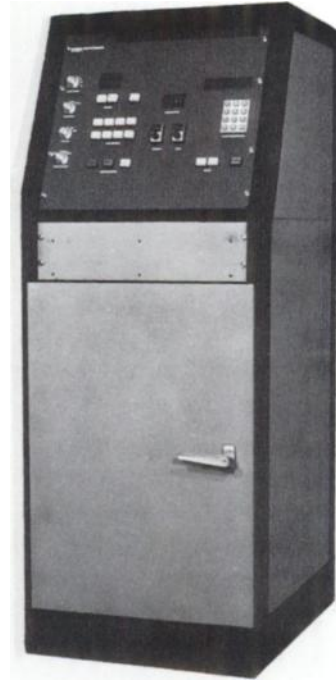
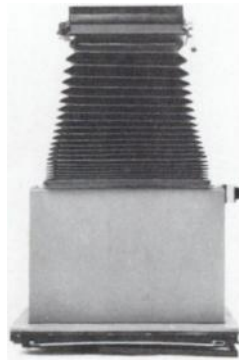
**Multi-Imager 1**

Multi-Imager 1 uses the CRT of the gamma camera to record static, dynamic, whole body, and physiological function gated imaging procedures on transparency format. The system consists of an electronic programmer and a 5" x 7", 8" x 10", or 11" x 14" format oscilloscope camera.

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- Viewing aperture shows when it's time to reorder.
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- Unique two-compartment syringes permit separate storage of reagents for maximum stability.
- Mallinckrodt/Nuclear's formulation allows use of the kit with any commercially available generator.

Try this convenient kit now in your own laboratory (subject to necessary licensing). Ask your Mallinckrodt representative for a demonstration.



Catalog No 090

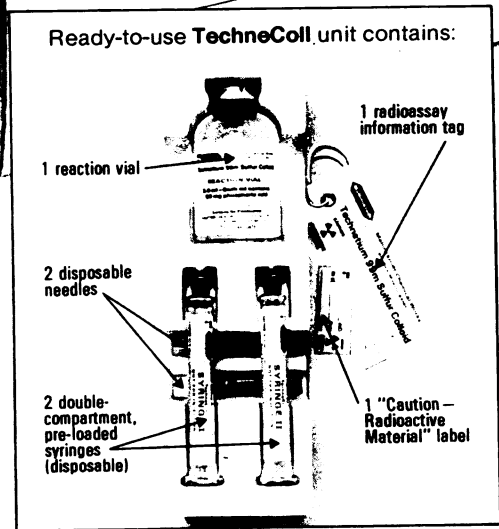


# TechneColl™

Kit for preparation of Technetium 99m Sulfur Colloid

**CAUTION:** This product is radioactive. See package insert for handling instructions.  
**READ ENTIRE PROCEDURE BEFORE USE** SEE PACKAGE INSERT  
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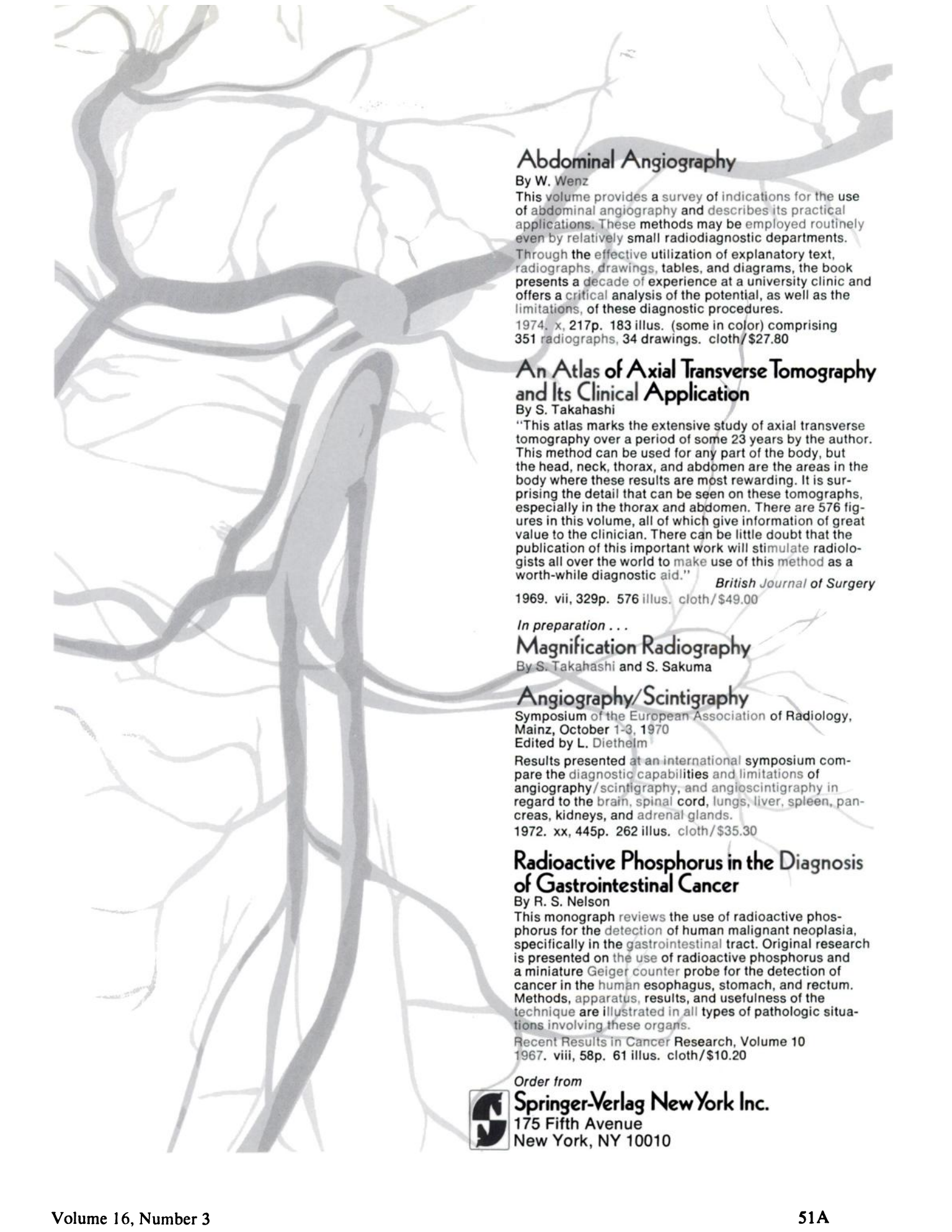
**PACKAGE CONTAINS**  
5 TechneColl™ units (each containing:  
1 reaction vial  
2 disposable needles  
2 double-compartment, pre-loaded syringes (disposable)  
1 radioassay information tag  
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*In preparation . . .*

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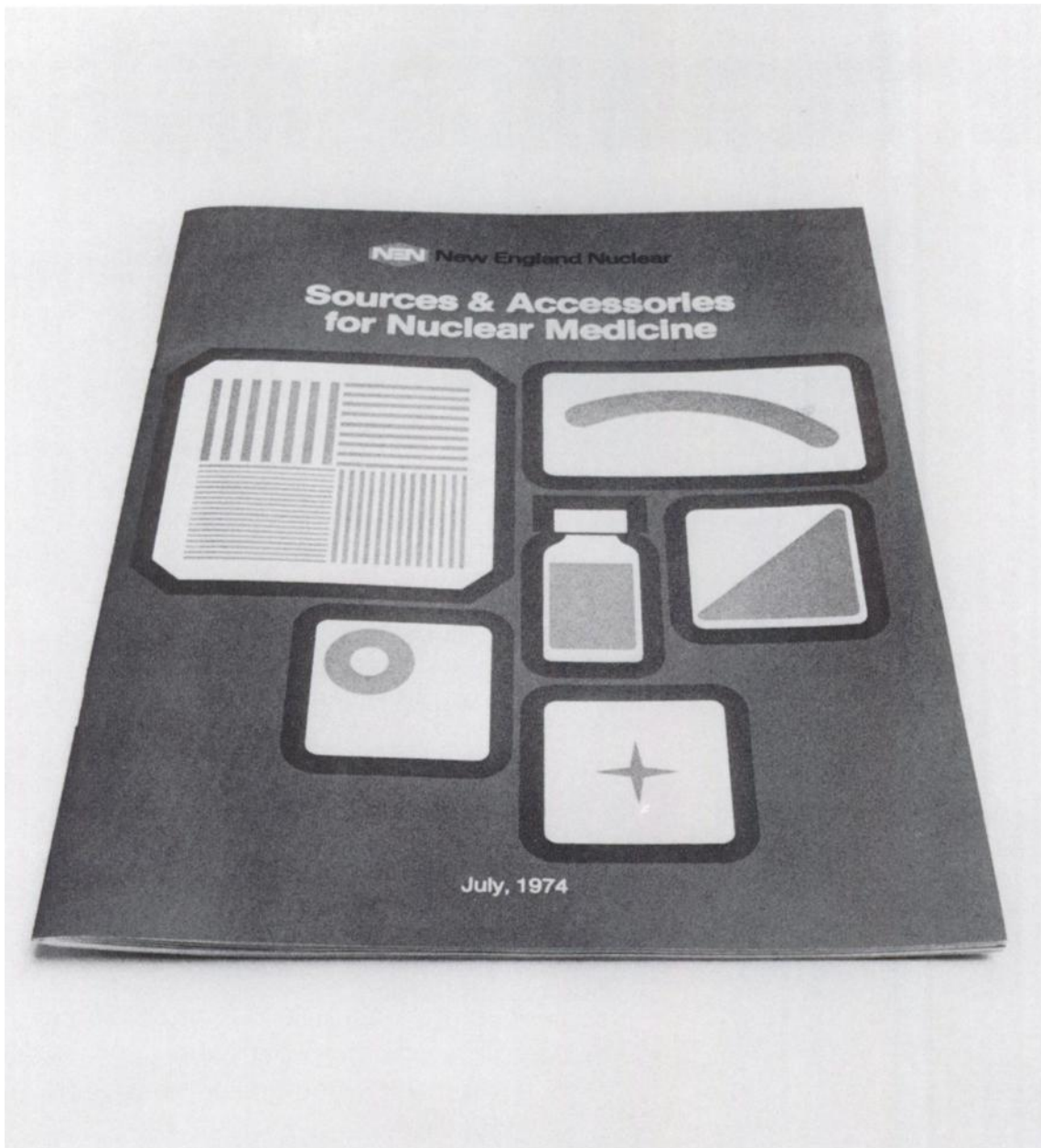
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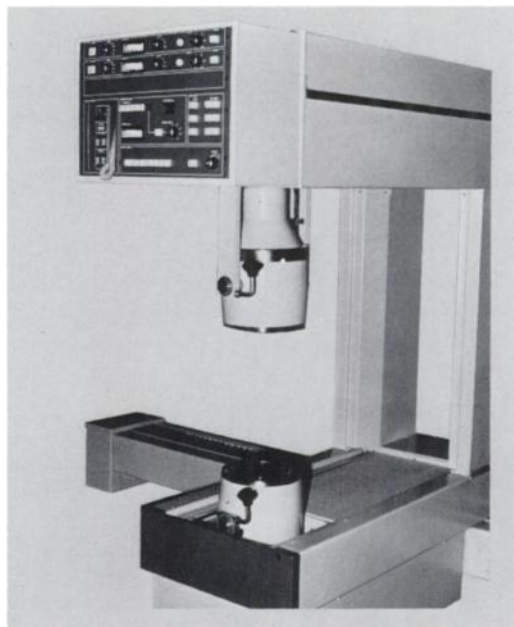
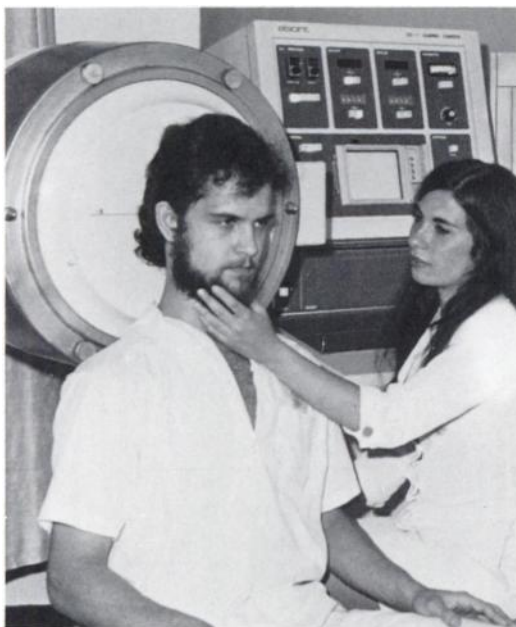
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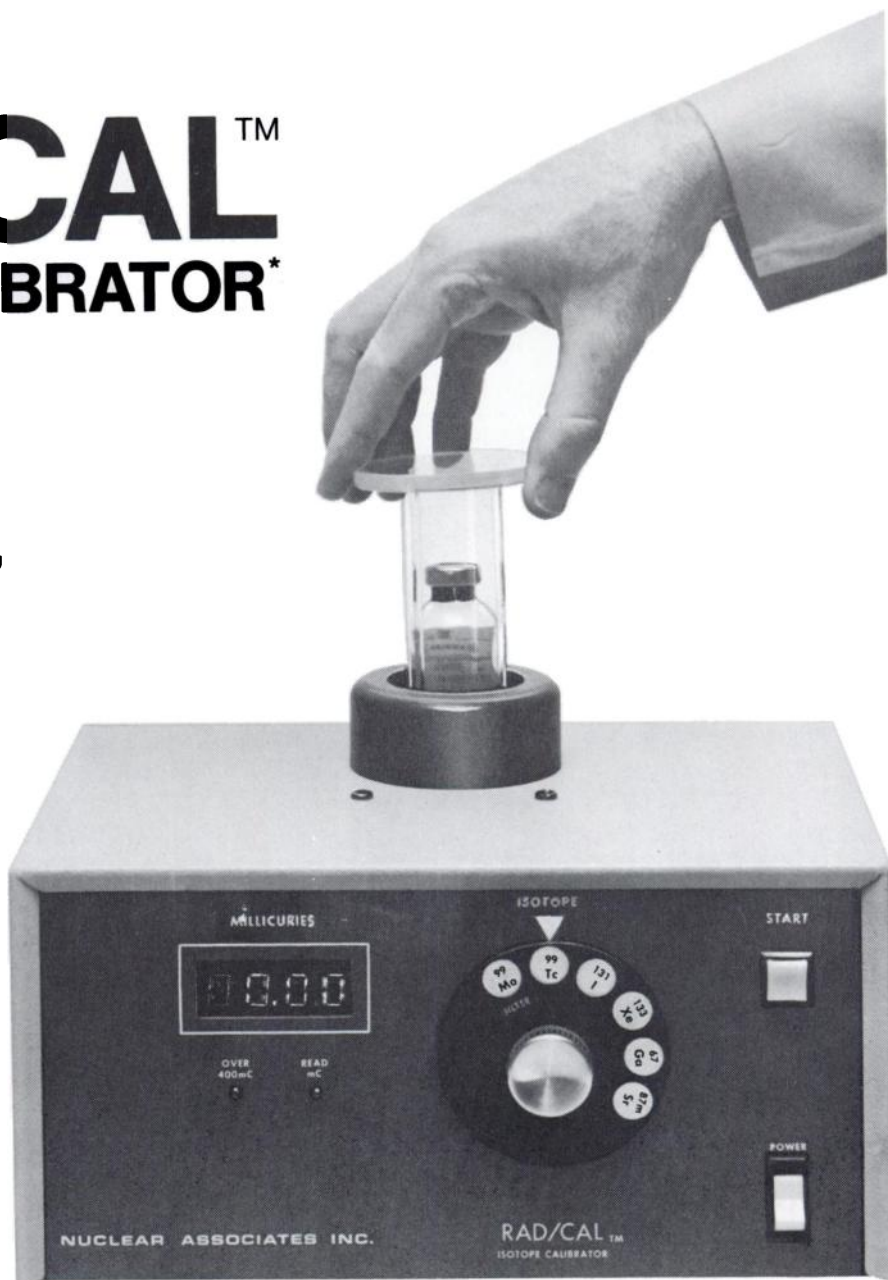
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B. Bock, R. Perez, C. Panneciere and R. DiPaola *J. Nuclear Med.* 14, 380 (1973); R. M. Hopkins, J. M. Creighton and D. R. VanDeripe *Ibid* 409; F. Hosain, P. Hosain, H. N. Wagner, G. L. Dunson and J. S. Stevenson *Ibid* 410; R. Marty and J. D. Denney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



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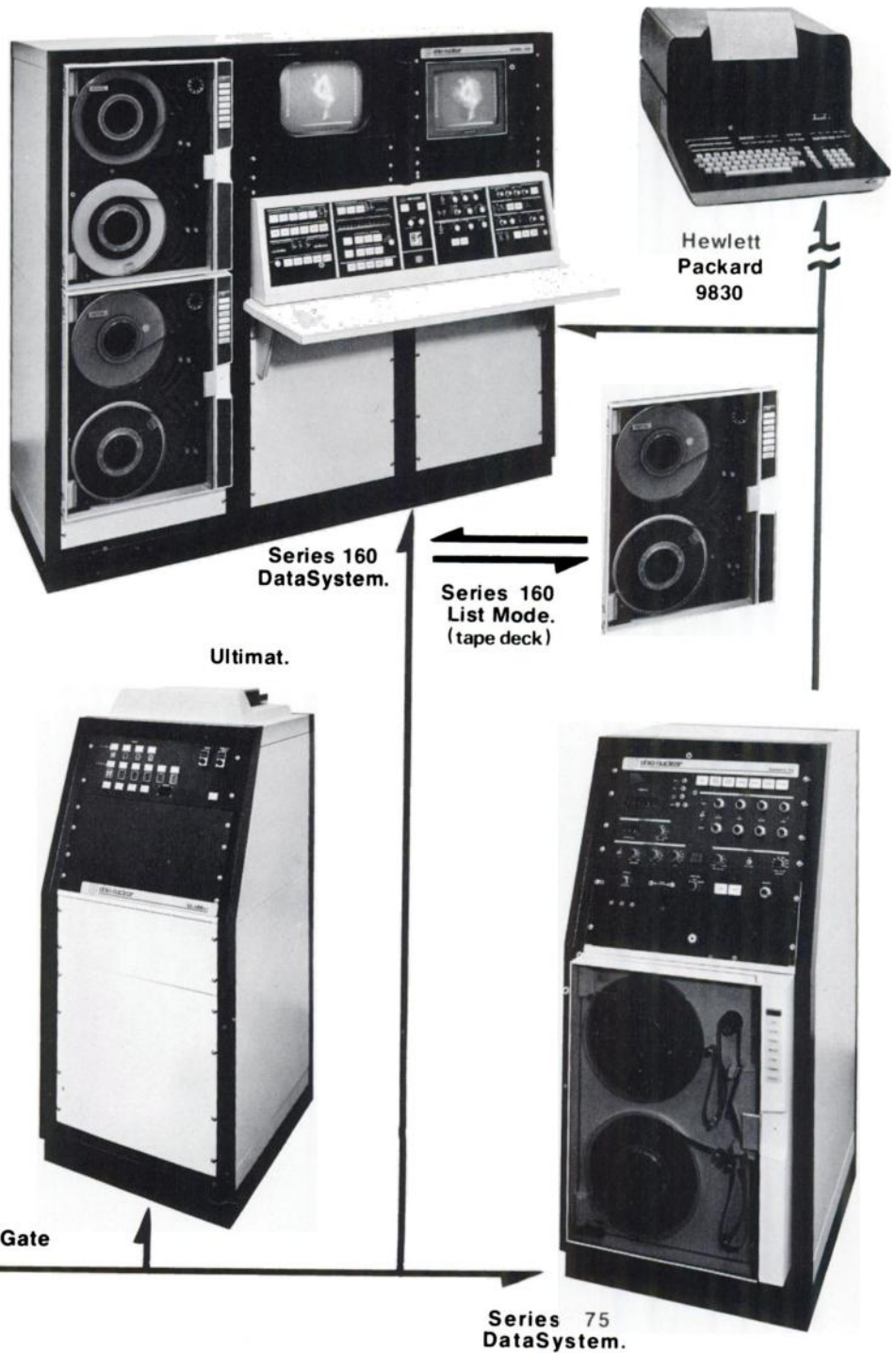
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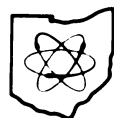
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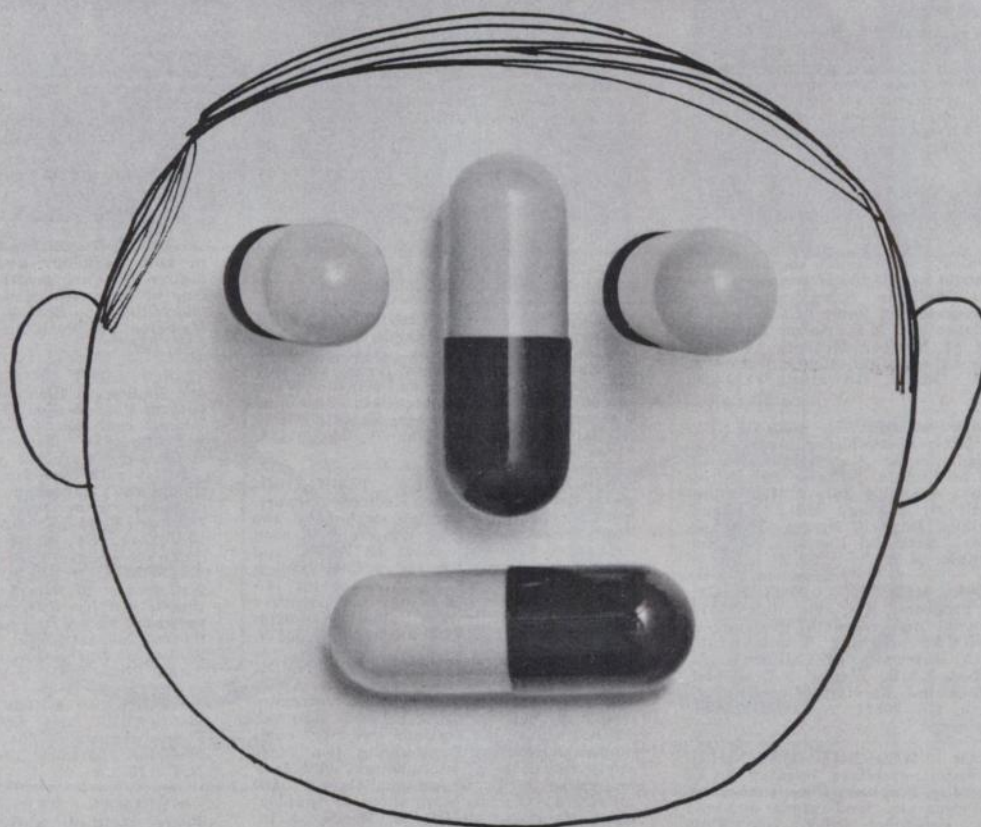
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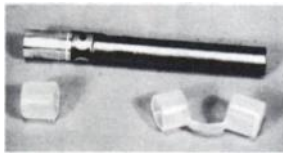
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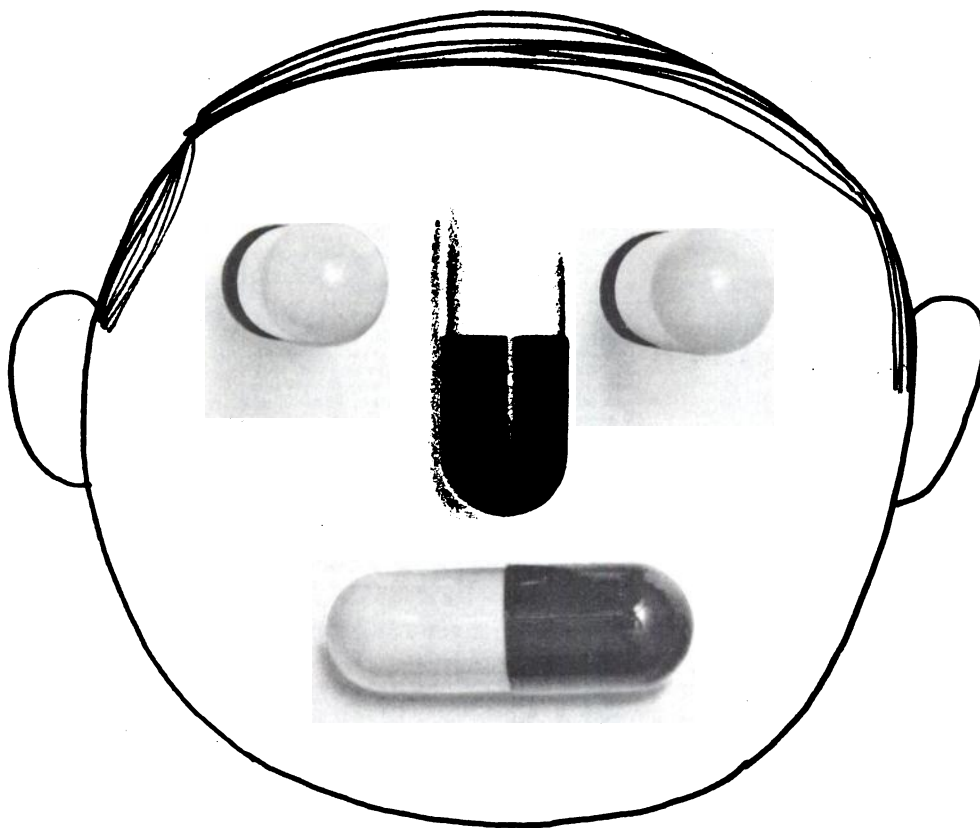
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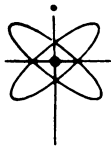
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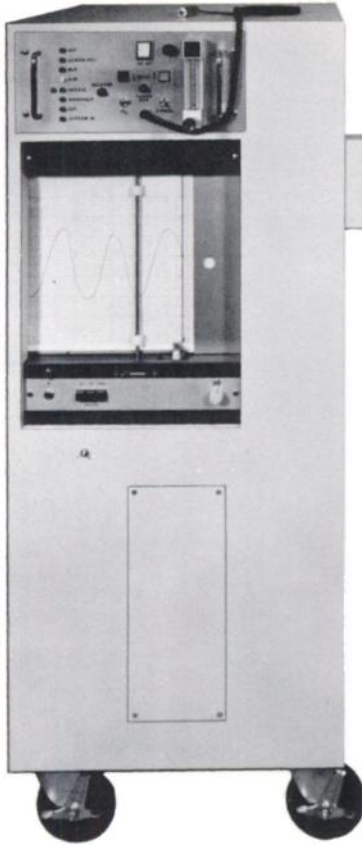
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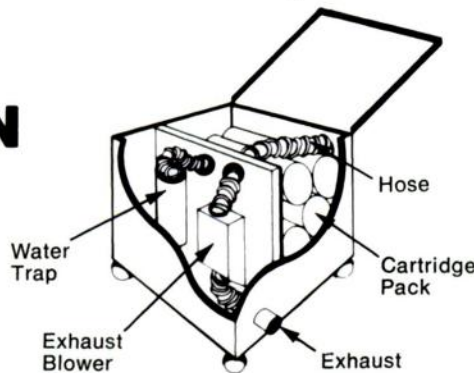
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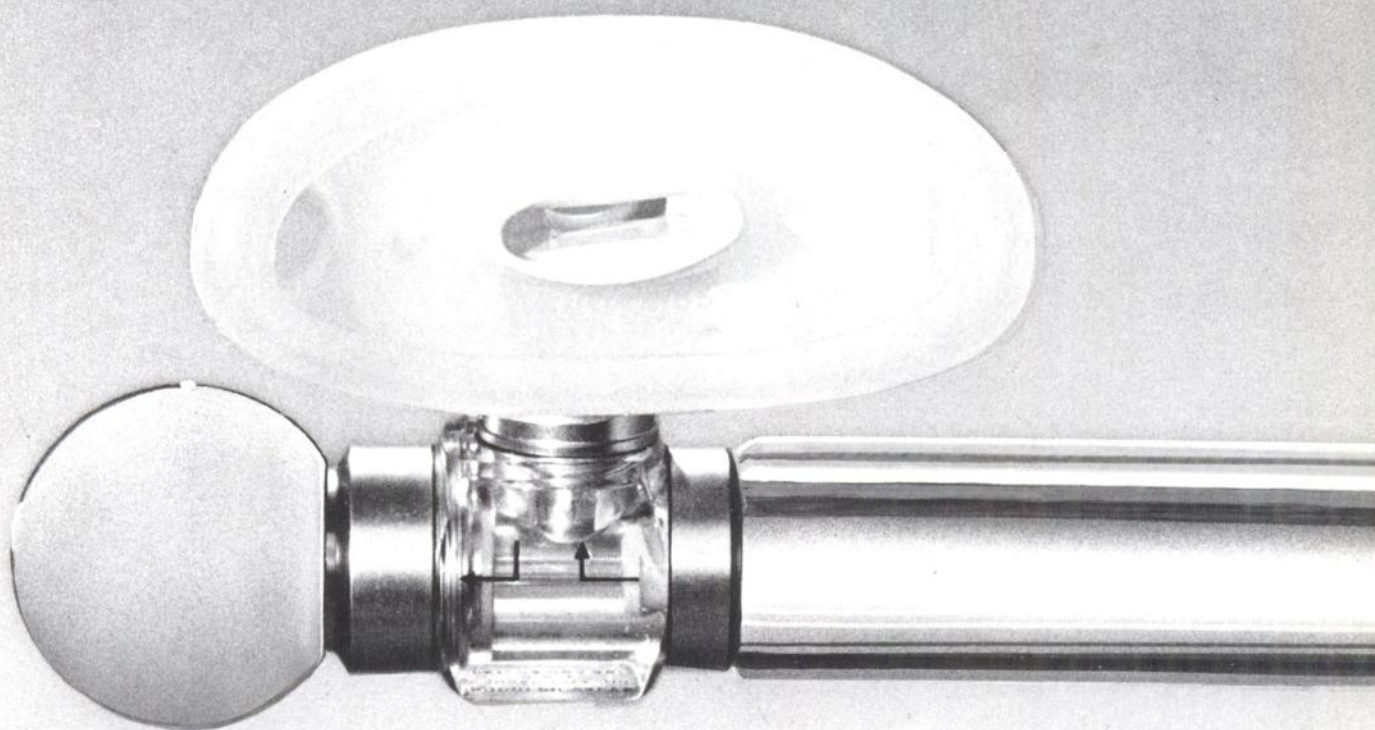
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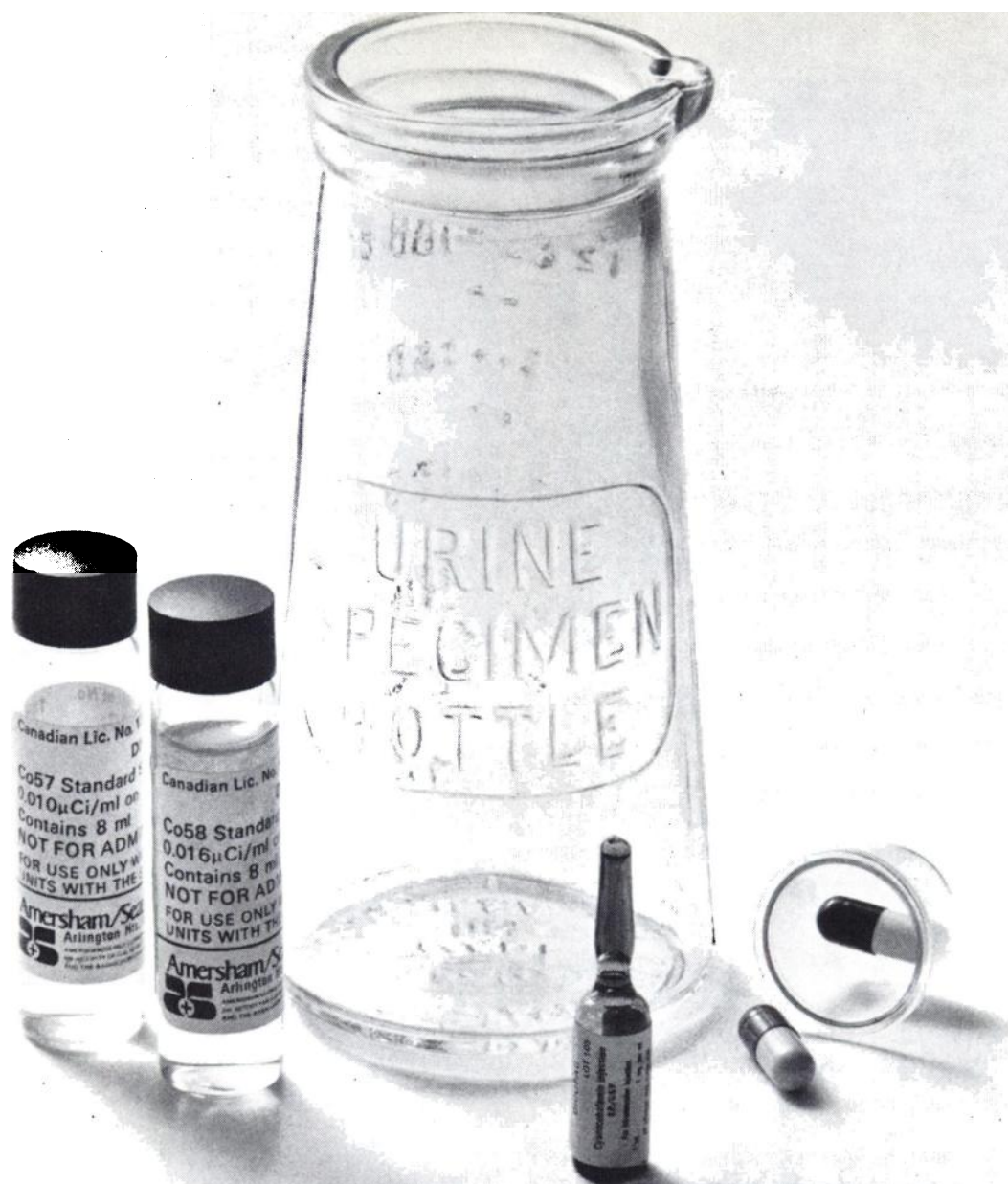
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**ACTIONS:** Oral vitamin B<sub>12</sub> is normally coupled with intrinsic factor (IF) contained in the gastric juice secreted by the stomach and the vitamin B<sub>12</sub> combined with intrinsic factor is absorbed in the terminal ileum. Only intrinsic 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:** Dicipac 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**  
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**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.

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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 Dicipac 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 Dicipac test.

Both Dicipac 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 Dicipac 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 Dicipac Test" brochure provided with the Dicipac Kit for further information on procedural techniques.

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

Table I. Results of 24-hour urine excretions and  $\frac{\text{Co 57}}{\text{Co 58}}$  ratios with Dicipac:

Diagnosis	Mean values % (usual range)		$\frac{\text{Co 57}}{\text{Co 58}}$ 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	Co 58	
Co 57	Gamma -2	87.1	121.9
	Gamma -3	9.6	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, 1968.

<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	Weeks After Activity Date	
	Co 57 µCi	Co 58 µCi
10	0.60	1.48
9	0.59	1.38
8	0.58	1.38
7	0.57	1.29
6	0.56	1.21
5	0.55	1.13
4	0.54	1.05
3	0.53	0.98
2	0.52	0.92
1	0.51	0.86
0*	0.50	0.80

\*Activity date

**RADIATION DOSIMETRY:** The estimated absorbed radiation doses<sup>1</sup> to an average patient (70 kg) following the oral administration of one Dicipac 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) Normal and Pernicious Anemia	(rads/0.8 µCi Co 58) Normal Pernicious Anemia
Liver*	0.065	0.14 0.03
Stomach	0.000041	0.00027 0.00042
Small Intestine	0.00007	0.00043 0.0013
Upper Large Intestine	0.00013	0.00070 0.0021
Lower Large Intestine	0.00030	0.0018 0.0053
Testes*	0.0028	0.0074 0.00037
Ovaries*	0.0033	0.010 0.0021
Whole-body*	0.0050	0.012 0.0022

\*The administration of a flushing dose of non-radioactive B<sub>12</sub> will decrease the dose 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 Dicipac 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.

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



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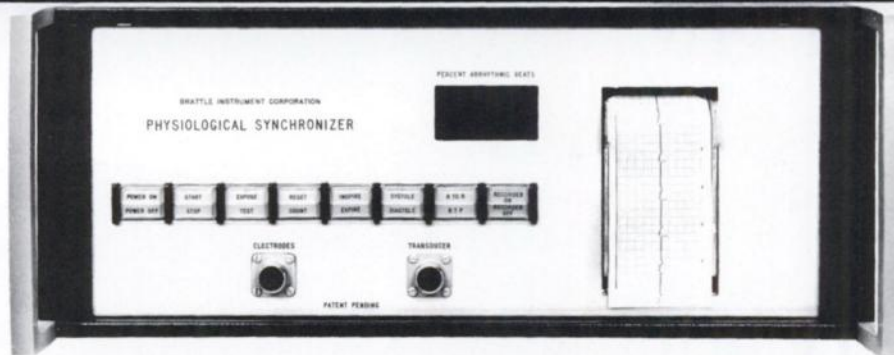
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LAO, SYSTOLE

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