

# THE I<sup>123</sup> Imperative Sodium Iodide I 123 for Thyroid Studies

- 1** Radioiodine is trapped by the thyroid and *organified* in the synthesis of thyroxine.  $^{99m}\text{TcO}_4^-$  is also trapped by the thyroid but is not organified. Consequently, Tc99m activity does not always indicate the physiologic condition of the thyroid.<sup>1</sup>
- 2** Radioiodine clearly demonstrates the “cold,” non-functioning nodules that may be associated with malignant thyroid tumors. Such nonfunctioning nodules have appeared “hot” or “cold” on images obtained with Tc99m, necessitating a confirmatory radioiodine scan.<sup>2,3</sup>
- 3** Radioiodine thyroid imaging is preferred to Tc99m in such instances as investigation of patients with possible retrosternal thyroid tissue or with unsatisfactory Tc99m images due to poor radionuclide concentration.<sup>3</sup>

<sup>1</sup>Steinbach, HL, Kundy, D, Moss, M, et al: A comparison of three agents in thyroid uptake and scintigraphy. Scientific Exhibit, Society of Nuclear Medicine, Philadelphia, June 16-20, 1975.

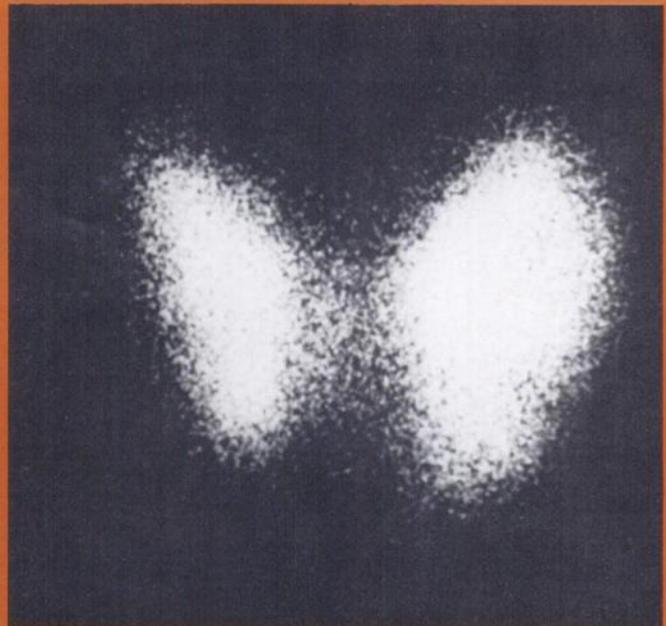
<sup>2</sup>Information for Physicians—“Irradiation-Related Thyroid Cancer” prepared by the Division of Cancer Control and Rehabilitation, National Cancer Institute, DHEW Publication No. (NIH) 77-1120, p.13.

<sup>3</sup>Arnold, JE, Pinsky, S: Comparison of  $^{99m}\text{Tc}$  and  $^{123}\text{I}$  for Thyroid Imaging. *J. Nucl. Med.*, 17:261, 1976.

# Organification is Imperative to Thyroid Studies



A palpable nodule in the left lower lobe present for at least six years considered to be "functioning" on the  $^{99m}\text{TcO}_4^-$  image.



The  $^{123}\text{I}$  image demonstrated that this nodule was "non-functioning."

Medi-Physics Sodium Iodide I 123 is important for informative thyroid studies. The principle gamma emission of I 123 is 159 keV which is well suited for gamma camera imaging. The 13.2 hours half-life and lack of non-penetrating radiations minimize the absorbed radiation dose. Thyroid uptake studies may be performed at 2, 4, 6, and

24 hours. If desired, a thyroid scan and a quantitative radioiodine uptake measurement may be performed simultaneously. Sodium Iodide I 123 is available in capsules or solution for next day delivery almost anywhere in the United States. Call Toll Free (in Calif.) (800) 772-2446; (outside Calif.) (800) 277-0483 for further information.

## medi+physics™

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

### SODIUM IODIDE I 123

#### CAPSULES AND SOLUTION FOR ORAL ADMINISTRATION

**DESCRIPTION:** Sodium iodide I 123 for diagnostic use is supplied as capsules and in vials as an aqueous solution for oral administration. At calibration time each capsule has an activity of 100 microcuries and each vial contains solution with a total specific concentration of two millicuries per ml.

**INDICATIONS:** Sodium iodide I 123 is indicated for use in the diagnosis of thyroid function and imaging.

**CONTRAINDICATIONS:** None known.

**WARNINGS:** This radiopharmaceutical should not be administered to children or to patients who are pregnant or to nursing mothers unless the information to be gained outweighs the potential hazards. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, in women of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses. However, when studies of thyroid function are clinically indicated for members of these special population groups, use of I 123 would be preferable to the use of I 131 in order to minimize radiation dosage.

**PRECAUTIONS:** Sodium iodide I 123 as well as other radioactive drugs must be handled with care. Appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Care should also be taken to minimize radiation exposure to the patient consistent with proper patient management. The prescribed Sodium iodide I 123 dose should be administered as soon as practicable in order to minimize the fraction of radiation exposure due to relative

increase of radionuclidic contaminants with time. The uptake of I 123 may be decreased by recent administration of iodinated contrast materials, by intake of stable iodine in any form, or by thyroid, anti-thyroid and certain other drugs. Accordingly, the patient should be questioned carefully regarding diet, previous medication, and procedures involving radiographic contrast media.

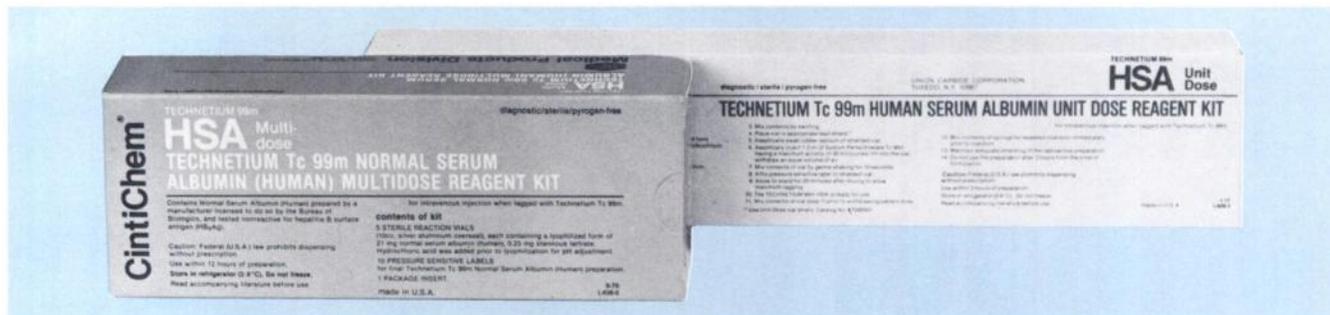
**ADVERSE REACTIONS:** There were nine adverse reactions reported in a series of 1,393 administrations. None of these were attributed to I 123. Five adverse reactions, consisting of gastric upset and vomiting, were attributed to a filler in the capsule. Two cases of headache and one case of nausea and weakness were attributed to the fasting state. One case of garlic odor on the breath was presumed to be attributable to the presence of tellurium.

**DOSAGE AND ADMINISTRATION:** The recommended oral dose range for diagnostic studies of thyroid function in the average adult patient (70 kg) is from 100 to 400 microcuries. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration. Concentration of I 123 in the thyroid gland should be measured in accordance with standardized procedures.

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

**HOW SUPPLIED:** Sodium iodide I 123 for oral administration is supplied in aqueous solution in glass vials and in capsules.

# THE EASY WAY TO YOUR PATIENT'S HEART



- **RAPID EASY PREPARATION<sup>1</sup>**
- **EXCELLENT BINDING EFFICIENCY<sup>2</sup>**
- **STABLE FORMULATION<sup>2</sup>**
- **CONVENIENT USAGE METHODOLOGY<sup>1</sup>**
- **CONSISTENT RESULTS<sup>2</sup>**
- **UNIT DOSE ECONOMY  
OR MULTIDOSE UTILITY**

For ordering, customer service and technical information call toll-free: (800) 431-1146, until 7:00 p.m. Eastern Standard Time. In New York State, call (914) 351-2131, ext. 227.

**CintiChem<sup>®</sup>**  
TECHNETIUM 99m

## Technetium Tc 99m Normal Serum Albumin (Human) Reagent Kit **HSA** DIAGNOSTIC-FOR INTRAVENOUS USE

### BRIEF SUMMARY OF PRESCRIBING INFORMATION

#### Indications and usage

Technetium Tc 99m Human Serum Albumin is used as an agent for imaging the heart blood pool and to assist in the detection of pericardial effusion and ventricular aneurysm.

#### contraindications

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

#### warnings

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 children or to patients who are pregnant or to nursing mothers unless the expected benefits to be gained outweigh the potential hazards.

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

#### precautions

The components of the kit are sterile and pyrogen-free. It is essential that the user follows the directions carefully and adheres to strict aseptic procedures during preparation of the radiodiagnostic.

Technetium Tc 99m Human Serum Albumin must not be used after three hours from the time of formulation.

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

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

Safety and effectiveness in children have not been established.

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

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

#### adverse reactions

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

#### how supplied

##### unit dose kit

The kit consists of 10 unit dose reaction vials each containing a lyophilized mixture of 7 mg human serum albumin and 0.08 mg stannous tartrate. Hydrochloric acid was added prior to lyophilization for pH adjustment.

##### multidose kit

The kit consists of 5 multidose reaction vials each containing a lyophilized mixture of 21 mg human serum albumin and 0.23 mg stannous tartrate. Hydrochloric acid was added prior to lyophilization for pH adjustment.

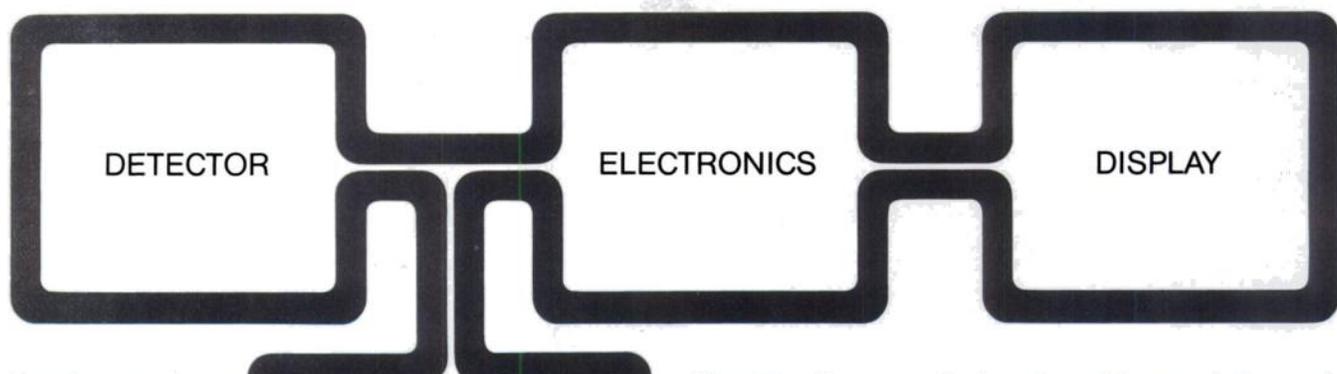
### FOR FULL PREPARATION AND PRESCRIBING INFORMATION, SEE PACKAGE INSERTS.

Notes: <sup>1</sup>Refer to package insert for full preparation and prescribing information. <sup>2</sup>Data on file at Union Carbide Corporation, Tuxedo, New York

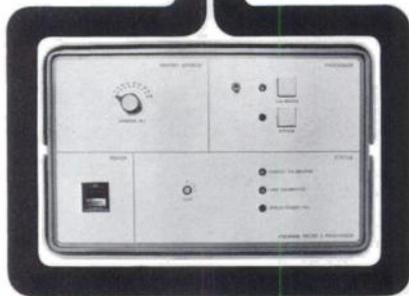
**UNION CARBIDE** FROM ATOM TO IMAGE

Union Carbide Corporation • Medical Products Division • Nuclear Products • P.O. Box 324 • Tuxedo, New York 10987  
CintiChem is a registered trademark of Union Carbide Corporation.

# Clean up image uniformity without covering up clinical information.



If you're now using a Picker Dyna<sup>®</sup> Camera system you're already accustomed to working with images well within established clinical confidence levels. With many other systems it takes



uniformity correction to approach Picker's intrinsic system image quality. When you start with a Picker system and add our new Micro Z<sup>™</sup> Processor, you now get unequalled resolution and uniformity through our unique and exclusive energy correction technique. And, unlike other correction devices, Picker's Micro Z shows you more of what you're looking for — without eliminating events you might need to see — and in less time.

**Beware the cover-up.** Systems that reject counts at the scope end tend to produce cosmetically acceptable pictures. You can see definite improvement. Unfortunately, in correcting these non-

uniformities, direct count-skipping or count-adding methods can cover up the very lesions you seek to find. The Picker system works differently. Micro Z is interfaced with the DynaCamera system

at the front end between the detector and the electronics. It functions not by covering up information, but by accepting more good counts before electronic processing. Cosmetically you get the clinical image you expected. Diagnostically, you get a great deal more information.

**Don't trade numbers for clarity.** The accompanying defect of cosmetics is a loss of numeric accuracy. The Picker system gives you both — and a choice of either. A simple switch lets you optimize energy resolution and/or cosmetic uniformity. The secret of our Micro Z Processor is a digitally controlled energy window that is automatically set for optimum scatter rejection

pulse by pulse and improved photopeak efficiency.

**The Picker investment in better resolution.** Our new Micro Z Processor will keep your DynaCamera system performing well ahead of its competitors. At the same time, it will bring you more relevant information better clinical contrast, and an increase in your diagnostic certitude. It's another example of Picker's continuing plan to let you do more with the diagnostic equipment you already own. For more information and a reprint of a paper delivered at SNM in Anaheim, entitled "Uniformity Correction with the Micro Z Processor," please write: Picker Corporation, 12 Clintonville Road, Northford, CT 06472 (203-484-2711); or Picker International, 595 Miner Road, Cleveland, OH 44143.

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



# Tech It!

Because quality is important to your image ... Check your Products with a Tech Kit! It's the only move to make.

Tech is a quality control testing system which provides a quick, convenient and inexpensive means for determining unbound and free Technetium 99m in the following products:

PYROPHOSPHATE  
DIPHOSPHONATE  
POLYPHOSPHATE  
MDP

PHYTATE  
DTPA  
MICROSPHERES  
HUMAN SERUM ALBUMIN

GLUCOHEPTONATE  
SULFUR COLLOID  
MACROAGGREGATED ALBUMIN

For more detailed information, contact:



**ACKERMAN NUCLEAR, INC.**

Pharmaceuticals for Nuclear Medicine  
445 West Garfield Avenue  
Glendale, California 91204, U.S.A.  
(213) 246-2555



## The Flexible Concept in Gamma Imaging Systems

# RAYTHEON'S STEP TWO

## AN ADVANCED MICROPROCESSOR-BASED ANALOG IMAGING DEVICE

### FEATURES

- **MULTIPLE LENS OPTICS** Four lens distributor, imaging the output of a display form CRT on 8" x 10" film, dot size 0.010" for superb image quality.
- **IN-LINE CONFIGURATION** No beam-bending mirrors to introduce distortion or unsharpness.
- **KEYBOARD DATA ENTRY** Familiar calculator type operation for easy entry of maximum data.
- **FULL NUMERICS IMAGING** Permanent record of hospital name, date, time of day, patient number, counts/frame, time/frame, frame number.
- **AUTOMATIC EXPOSURE CONTROL** Precise film density control via computer integration of these factors: format size, type of study, CRT drift, counts or preset ID.
- **DUAL INTENSITY PROVISION** Choice of two intensities—at fixed differential—offers improved detail perception.
- **BROAD FORMAT SELECTION** You may choose from these 9 . . . 4, 6, 8, 12, 16, 20, 24, 30, 36 frames, for ideal image size/organ matching.
- **EASY FRAME POSITIONING** Permits advancing or backspacing frames for mixing and matching frame size. Allows the collection of a complete patient study on a single film.
- **16 DIGIT LED READOUT** High visibility indicators for reading preset time, preset counts, information density, running counts, patient number, frame number, format size, format location.

**RAYTHEON**

**RAYTHEON MEDICAL ELECTRONICS**

70 Ryan Street • Stamford Connecticut 06907 • Tel: 800-243-9058

Visit us at booth "0" in Atlanta, at the SNM show

For  
high-quality  
lung perfusion  
imaging

# PULMOLITE™

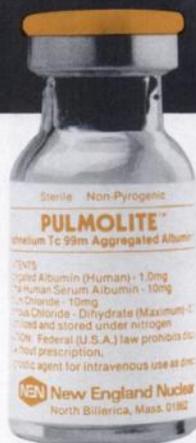
Technetium Tc 99m Aggregated Albumin Kit

Convenient  
stores at room temperature

Rapidly prepared  
inject sodium pertechnetate  
Tc 99m into vial, shake for  
30 seconds—and it's ready  
for administration

Complete  
no additional reagents or  
equipment

Economical  
5 vial package and 30 vial  
Convenience Pak



**Indications and Usage:** Technetium Tc 99m aggregated albumin is indicated as a lung imaging agent to be used as an adjunct in the evaluation of pulmonary perfusion.

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

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

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

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

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

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

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

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

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

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

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

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

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

Adequate reproduction studies have not been performed in animals to determine

whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m aggregated albumin should be used in pregnant women only when clearly needed.

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

Safety and effectiveness in children have not been established.

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

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

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

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

**Dosage and Administration:** The recommended intravenous dose range for the average patient (70kg) is 1 to 4 millicuries. The volume of the dose may vary from 0.2 to 13ml.

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

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

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

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

Each vial contains 3.6-6.5 x 10<sup>6</sup> aggregated albumin particles.

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

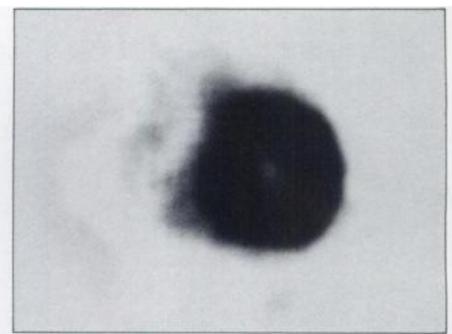
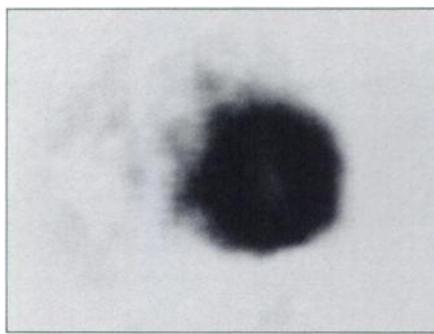
Included in each five (5) vial kit is one (1) package insert and six (6) radiation labels. Included in each thirty (30) vial kit is one (1) package insert and thirty-six (36) radiation labels.

Cat. No. NRP-415



**New England Nuclear**  
Medical Diagnostics Division

# ADAC.



## Now you can use it for

With an ADAC Nuclear Medicine Computer, you are only one short step from a full capability in Emission Tomography.

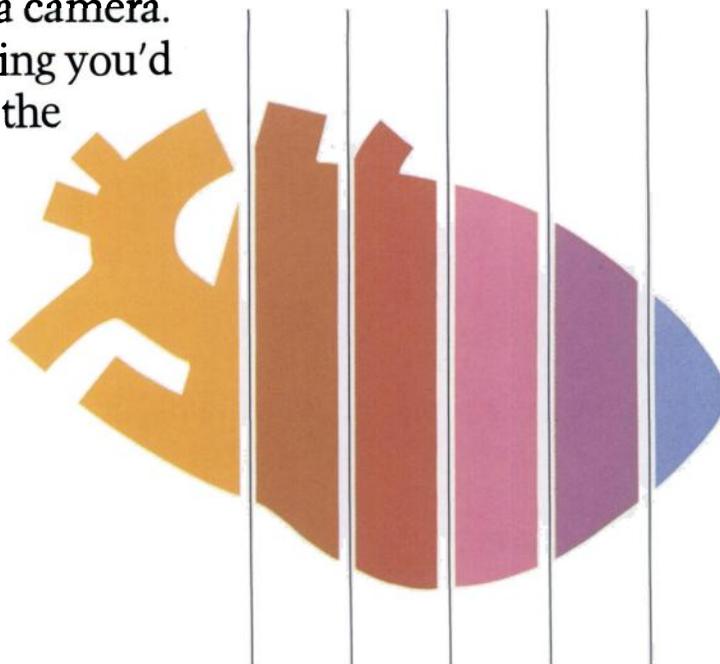
All you need is the economical new ADAC Tomography Option.

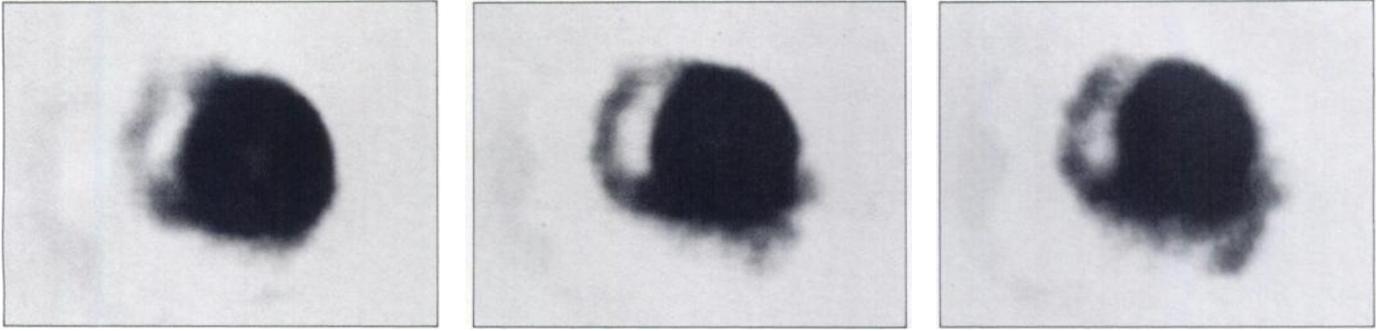
It makes this valuable new diagnostic tool immediately available for myocardial perfusion tomography.

The Option includes a multiple-pinhole collimator, cart, point source, and flood phantom for the camera—plus sophisticated, clinically-proven software developed on the ADAC computer itself.

The software enables your ADAC Nuclear Medicine Computer to display multiple images that have been obtained simultaneously by the gamma camera.

The quality is everything you'd expect from the developer of the





# Emission Tomography.

ADAC Nuclear Medicine Computer. For more than three years, doctors have called it the finest system of its kind.

Why? Among other things, a  $512 \times 512$  display format and 64 shades of gray that deliver an image nearly identical to original analog scintiphotos. And an easy-to-use computer language in plain English.

What's more, the cost is surprisingly low.

If your plans for the present or future include emission tomography, ADAC is the system of choice. For additional information please write or call collect.

ADAC Laboratories, Inc. 255 San Geronimo Way, Sunnyvale, California 94086. Telephone: (408) 736-1101.



**ADAC**  
Nuclear Medicine Computer

# It's the Pathology that counts!



When it comes to a diagnostically significant bone scan, "altered osteogenesis" is the name of the game. That's why we're proud of MPI Stannous Diphosphonate (Technetium Tc 99m Etidronate Kit.) You can count on it to assist you in distinguishing bone lesions from normal tissue.

We're proud of it for other reasons, too. For example, you'll be less concerned about oxidation and hydrolysis of the labeled reagent

because we've added ascorbic acid. And because we supply it as a liquid, you can inspect MPI Stannous Diphosphonate for particulates before you begin labeling it with Tc 99m. This spares you unnecessary radiation exposure to your hands and eyes.

So when you want a bone agent that does more than count bones, give us a call. Toll free: (800) 227-0483—outside California. (800) 772-2446—inside California.

**A sixty-five year old male with prostatic CA underwent a Tc 99m EHDP Bone Study 3¼ hours after injection. The bone image demonstrated multiple focal skeletal abnormalities suggestive of widespread metastatic bone disease.**

*Courtesy of L. V. dos Remedios, M.D. Kaiser Foundation Hospital Oakland, California.*

medi+physics™

**For complete information consult the package insert, a summary of which follows:  
MPI Stannous Diphosphonate Technetium Tc 99m Etidronate Kit**

**DESCRIPTION:** Each reagent ampul of the kit contains 2.2 ml of a sterile, pyrogen-free aqueous solution containing 1.54 mg of etidronate sodium, 0.42 mg of anhydrous stannous chloride, and 3.87 mg of ascorbic acid. Hydrochloric acid and/or sodium hydroxide solution may have been added to adjust the pH to 2.5-5.0. When sterile, pyrogen-free sodium pertechnetate Tc 99m in isotonic saline is combined with the reagent, following the instructions provided with the kit, a complex is formed. Administration is by intravenous injection for diagnostic use.

**INDICATIONS:** MPI Stannous Diphosphonate is used as a bone imaging agent to delineate areas of altered osteogenesis.

**CONTRAINDICATIONS:** None known.

**WARNINGS:** This radiopharmaceutical drug product should not be administered to children, pregnant women, or nursing mothers, unless the expected benefit outweighs the potential risk. Radiopharmaceutical examinations of women of childbearing capability should be performed during the first few days following the onset of menses.

Preliminary reports indicate impairment of brain scans using sodium pertechnetate Tc 99m which have been preceded by a bone scan. The impairment may result in false positives or false negatives. Where feasible, brain scans should precede bone imaging procedures.

**PRECAUTIONS:** To minimize radiation dose to the bladder, the patient should be encouraged to drink fluids and void when the examination is completed and as often thereafter as possible for the next 4-6 hours. Adequate reproductive studies have not been performed in animals to determine whether this drug affects fertility in males or

females, has teratogenic potential, or has other adverse effects on the fetus. MPI Stannous Diphosphonate should be used in pregnant women only when clearly needed.

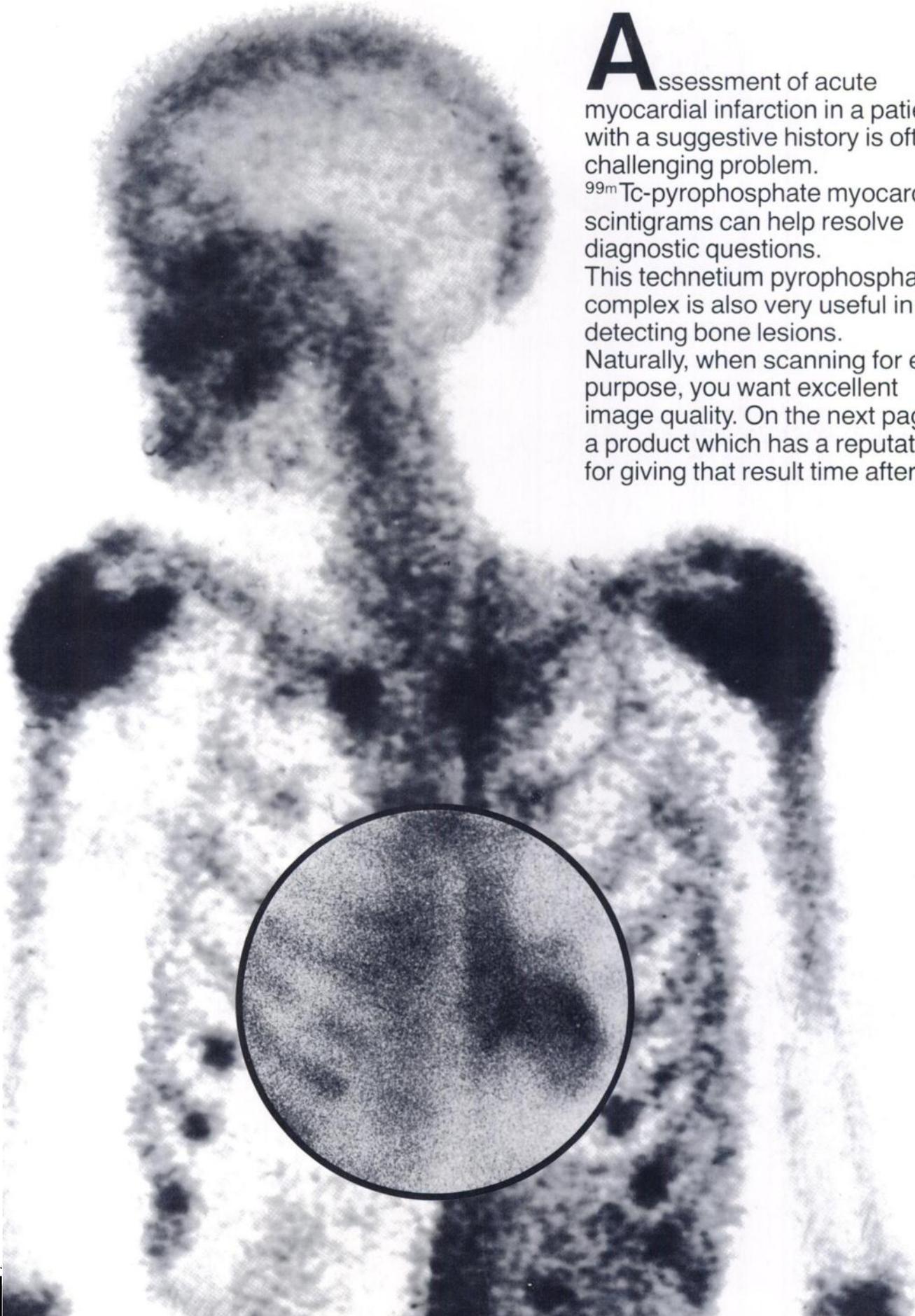
This drug is known to be concentrated in breast tissue and probably is present in the milk of lactating women. Nursing mothers who receive this drug should substitute formula feeding for several days following a bone scan. Safety and effectiveness in children have not been established.

**ADVERSE REACTIONS:** Seven suspected reactions to MPI Stannous Diphosphonate were reported in more than 22,500 clinical reports. There were two instances each of headaches and allergic reactions and one each of vomiting, rheumatoid arthritis flare-up, and skin rash.

**DOSAGE AND ADMINISTRATION:** The suggested adult dose is 5-15 mCi administered by slow I.V. injection. Do not administer more than 2.0 ml of unlabeled reagent per patient. Measure the patient dose with a suitable radioactivity calibration system immediately prior to administration. Scanning post-injection is optimal at 2 to 4 hours.

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

**HOW SUPPLIED:** Each kit package contains five sealed glass ampuls as described above, five sterile, pyrogen-free mixing vials, five each of mixing-vial and record labels and one package insert. The reagent ampuls should be protected from light and stored in their original container in a refrigerator.



**A**ssessment of acute myocardial infarction in a patient with a suggestive history is often a challenging problem.

<sup>99m</sup>Tc-pyrophosphate myocardial scintigrams can help resolve diagnostic questions.

This technetium pyrophosphate complex is also very useful in detecting bone lesions.

Naturally, when scanning for either purpose, you want excellent image quality. On the next page is a product which has a reputation for giving that result time after time.

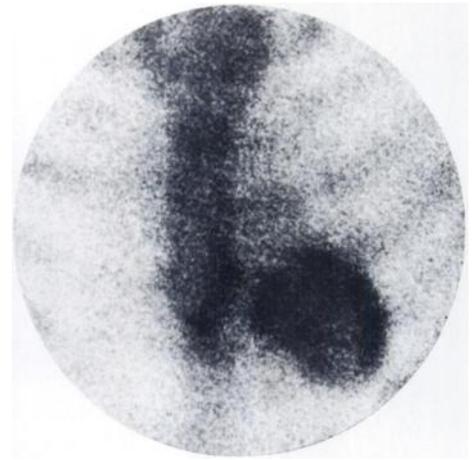
# If you want images as good as these—

## order Phosphotec® Technetium Tc 99m Sodium Pyrophosphate Kit

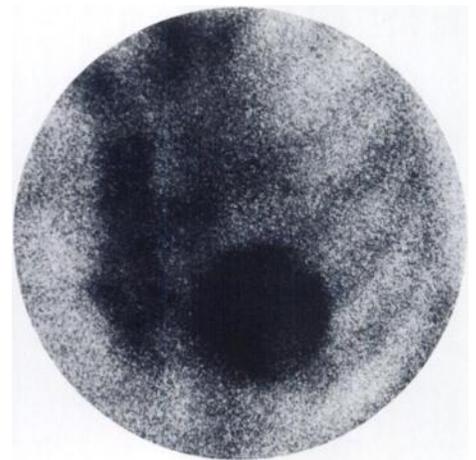


Imaging with <sup>99m</sup>Tc-pyrophosphate is an extremely sensitive technique, useful as an adjunct in determining the presence, location and extent of acute myocardial infarctions.

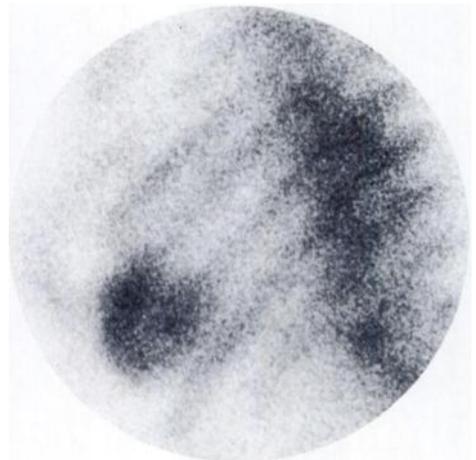
- Particularly useful in detecting recent infarcts when ECG's are equivocal when imaging is performed within 24 hours to 6 days after onset of suggestive symptoms.
- Myocardial scintigrams can help confirm the presence of infarction in cases where ECG's and serum enzymes are not specifically diagnostic.
- Cardiac imaging can be performed 45-60 minutes postinjection.



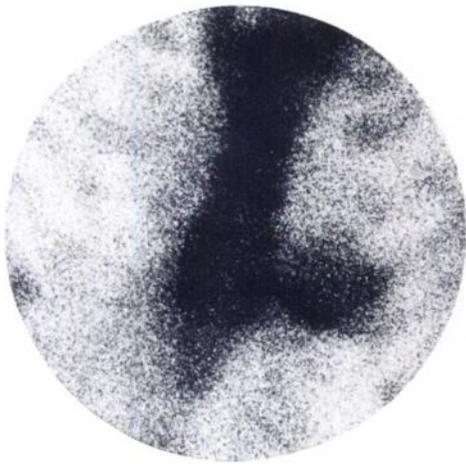
41-year-old male. Scans reveal marked abnormality of the anterior, inferior and posterior walls. Above: anterior.



Left anterior oblique.



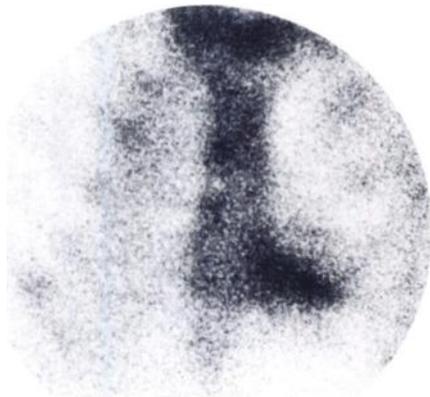
Left lateral.



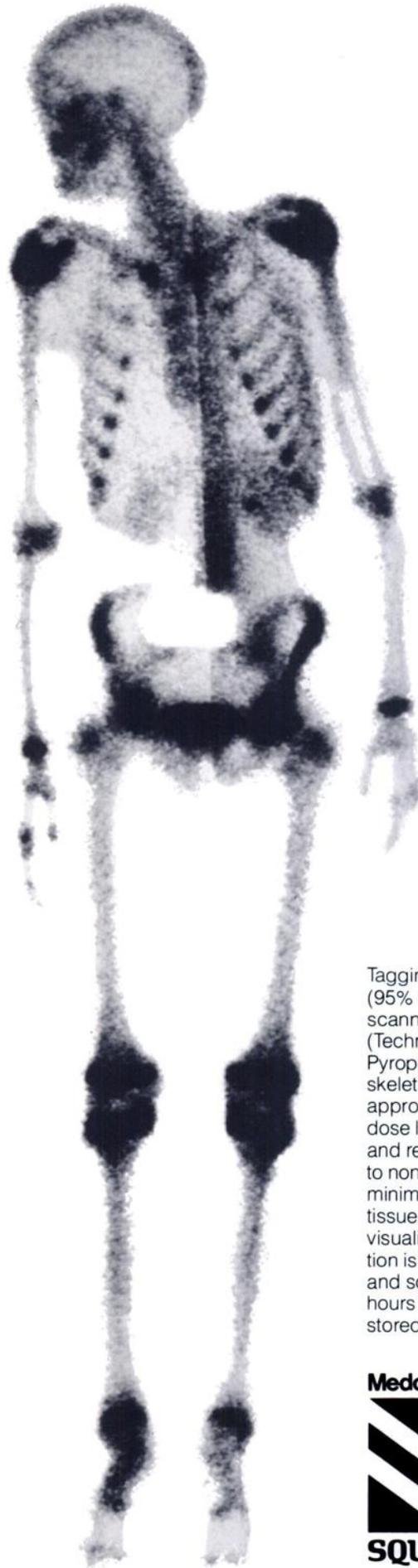
58-year-old male. Scans indicate inferior and posterior damage. Above: Anterior.



Left anterior oblique.



Right anterior oblique.



Tagging efficiency is excellent (95% bound at optimum time for scanning) when Phosphotec (Technetium Tc 99m Sodium Pyrophosphate Kit) is used for skeletal imaging. After two hours, approximately 55% of injected dose localizes in the bone; blood and renal clearance is rapid. Target to nontarget ratio is high, with a minimum amount of uptake in soft-tissue organs and little urinary tract visualization. Preparation of solution is a simple, two-step procedure, and solution may be used up to 12 hours after reconstitution when stored at 2°-8°C.

**Medotopes<sup>®</sup>**



**SQUIBB<sup>®</sup>**

See next page for brief summary.



**PHOSPHOTEC®**  
**Technetium Tc 99m Sodium Pyrophosphate Kit**

**DESCRIPTION:** Phosphotec provides all the nonradioactive components required to prepare a sterile, nonpyrogenic technetated (<sup>99m</sup>Tc) pyrophosphate-tin complex. Each reaction vial contains 40 mg sodium pyrophosphate (equivalent to 23.9 mg anhydrous sodium pyrophosphate) and 1 mg stannous fluoride; the product does not contain a preservative. When sterile, nonpyrogenic sodium pertechnetate Tc 99m is added to the reaction vial, a technetated (<sup>99m</sup>Tc) pyrophosphate-tin complex is formed.

**INDICATIONS AND USAGE:** Technetated (<sup>99m</sup>Tc) pyrophosphate-tin complex may be used as a bone imaging agent to delineate areas of altered osteogenesis. It is also a cardiac imaging agent used as an adjunct in the diagnosis of acute myocardial infarction.

**CONTRAINDICATIONS:** None known.

**WARNINGS:** This product should not be administered to patients who are pregnant or to nursing mothers unless the benefit 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 (approx. 10) days following the onset of menses.

It has been reported that false-positive or false-negative brain scans may result when brain scans using sodium pertechnetate Tc 99m are performed after a bone scan has been done using an agent containing stannous ions, e.g., a pyrophosphate bone agent. This is thought to be due to the interaction of Tc 99m with stannous ions inside red blood cells. Therefore, in those cases where brain scans are indicated along with imaging of bone or myocardial imaging, the brain scan should be performed first, if feasible. Alternatively, another brain imaging agent, such as Tc 99m DTPA, may be employed. False-positive and false-negative myocardial scans may occur; therefore, the diagnosis of acute myocardial infarction depends on the overall assessment of laboratory and clinical findings.

The contents of the Phosphotec reaction vial are intended to be used only for preparation of the I.V. solution and are **not** to be directly administered to the patient. Any sodium pertechnetate <sup>99m</sup>Tc solution which contains an oxidizing agent is **not** suitable for

use with Technetium Tc 99m Sodium Pyrophosphate Kit. The contents of the kit are not radioactive. However, after sodium pertechnetate <sup>99m</sup>Tc is added, adequate shielding of the final preparation must be maintained. Technetated (<sup>99m</sup>Tc) pyrophosphate-tin complex must be used within 12 hours after reconstitution.

**PRECAUTIONS:** In the use of any radioactive material, care should be taken to minimize radiation exposure to the patient and occupational workers consistent with proper patient management. Both prior to and following administration of the technetated (<sup>99m</sup>Tc) preparation, the patient should be encouraged to drink fluids and to void as often as possible thereafter to minimize radiation exposure to the bladder and background interference during imaging if not contraindicated by the patient's cardiac status. The patient's cardiac condition should be stable before beginning the cardiac imaging procedure. Interference from chest wall lesions such as breast tumors and healing rib fractures can be minimized by employing three projections (e.g., anterior, lateral, and left anterior oblique).

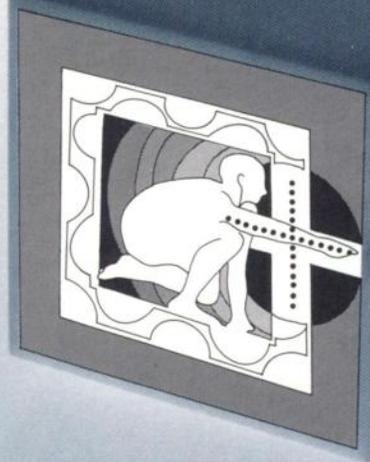
Adequate reproductive studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. This drug should be used in pregnant women only when clearly needed. It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken while a patient is on the drug since many drugs are excreted in human milk. Safety and effectiveness in children have not been established.

**ADVERSE REACTIONS:** No adverse reactions specifically attributable to the use of this radiopharmaceutical have been reported.

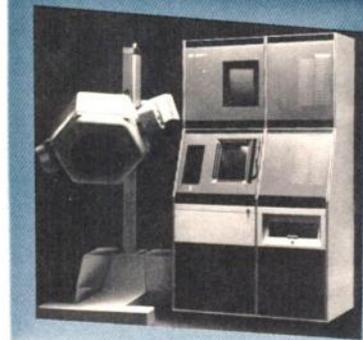
For full prescribing information, see package insert.

**HOW SUPPLIED:** In a kit containing five reaction vials (5 ml size).

**SQUIBB®** "The Priceless Ingredient of every product is the honor and integrity of its maker.™"



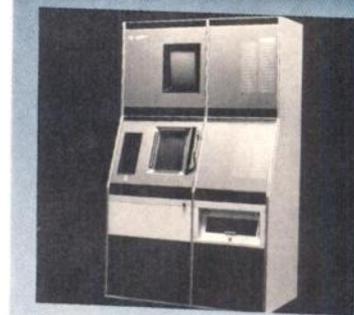
# A HISTORY OF PERFORMANCE III



**LFOV Standard**

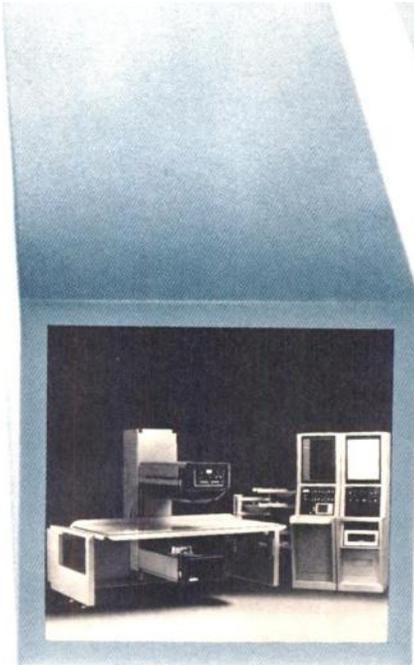


**P/G V Basic**

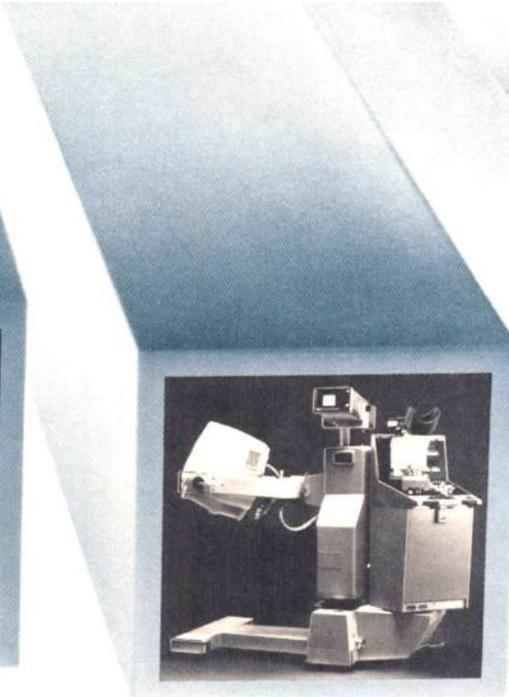


**Scintiview**

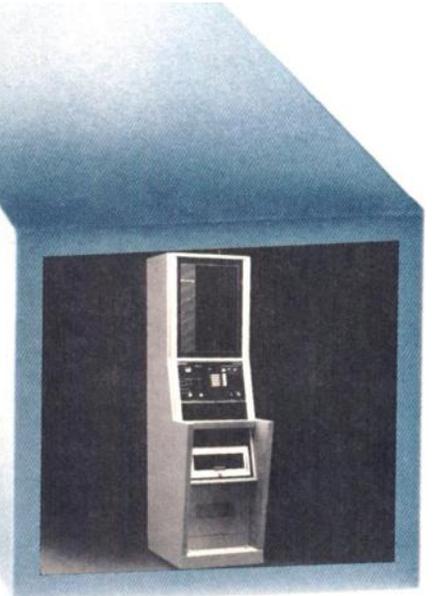
**A  
COMMITMENT  
TO THE  
FUTURE**



**Pho/Con**



**LEM**



**Accessories (Micro-Dot)**

responsibility to you. Inventive product ideas, engineering, testing, evaluation, production, and the most important after purchase feature—excellent service, are evidence of our continued commitment to the future.

We are committed to maintaining our position of leadership in the dynamic, ever-changing science of nuclear medicine by evolving ever more sensitive, high resolution instruments and systems (Cardiac Analysis Package) capable of early disease detection and analysis. You and the patients you care for deserve no less. Searle will continue to be the leader, providing only the finest in imaging equipment and services. That is our pledge to the medical community for the 1980's.

## **SEARLE**

**Searle Radiographics**  
Unit of Searle Medical Products  
2000 Nuclear Drive  
Des Plaines, IL 60018  
312/635-3100

1007DMO-1312 A



# CONSIDER. A COMPUTERIZED, CLINICALLY PROVEN rCBF ANALYSIS SYSTEM— COMPLETE WITH PROGRAMMING.

Harshaw's TASC-5 Computerized rCBF Analyzer offers the clinical investigator unprecedented flexibility in all phases of rCBF data analysis. It makes rCBF measurement as a diagnostic procedure a practical reality.

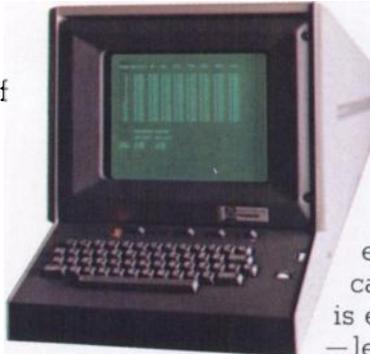
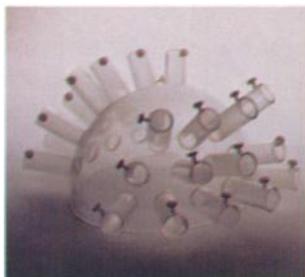
## COMPUTER AND SOFTWARE. A TOTAL SYSTEM.

The TASC-5 System with minicomputer offers turn-key efficiency for rCBF data acquisition and analysis. Non-technical personnel can qualify as operators since the computer controls all measurement and analysis functions. The inhalation software routine, a computer program based on the research of Dr. Walter Obrist, et al,\* is an integral part of Harshaw's TASC-5 System.

For facilities with computer capabilities, Harshaw's plug-in interface modules extend TASC-5 operation to any device with a RS-232-C compatible input. In this case an optional magnetic tape system provides data storage whenever immediate analysis is not possible. Several patient studies can be accumulated on tape, allowing the TASC-5 System to operate where computer access terminals are not readily available.

## THE HELMET

The TASC-5's unique new helmet-type probe holder assures reproducible probe placement for serial studies — an important aspect of stroke patient management. The clear acrylic helmet provides good visibility when adjusting the probes. Bilaterally spaced mounting holes permit the addition or relocation of probes.



## PLUG-IN CIRCUITRY DESIGN

Now and for the future, the TASC-5 System won't impose limits on expansion or modification. Plug-in circuitry is employed throughout — letting you add more

probes at any time without modifying the electronics or software. Almost any readout device can be accommodated. There are special probe holders for use with the intraarterial injection technique, and a series of probe/collimators designed for studies using  $^{127}\text{Xenon}$ .

## LEARN MORE ABOUT TASC-5 PERFORMANCE.

Harshaw's TASC-5 Regional Cerebral Blood Flow Analysis System — it's the newest in a line of Harshaw developments that makes efficient, radioisotopic measurements of rCBF practical in clinical situations. We'll be happy to demonstrate what it can do for you. Call us or write...

The Harshaw Chemical Company  
Crystal & Electronic Products, 6801  
Cochran Road, Solon, Ohio 44139.  
(216) 248-7400.

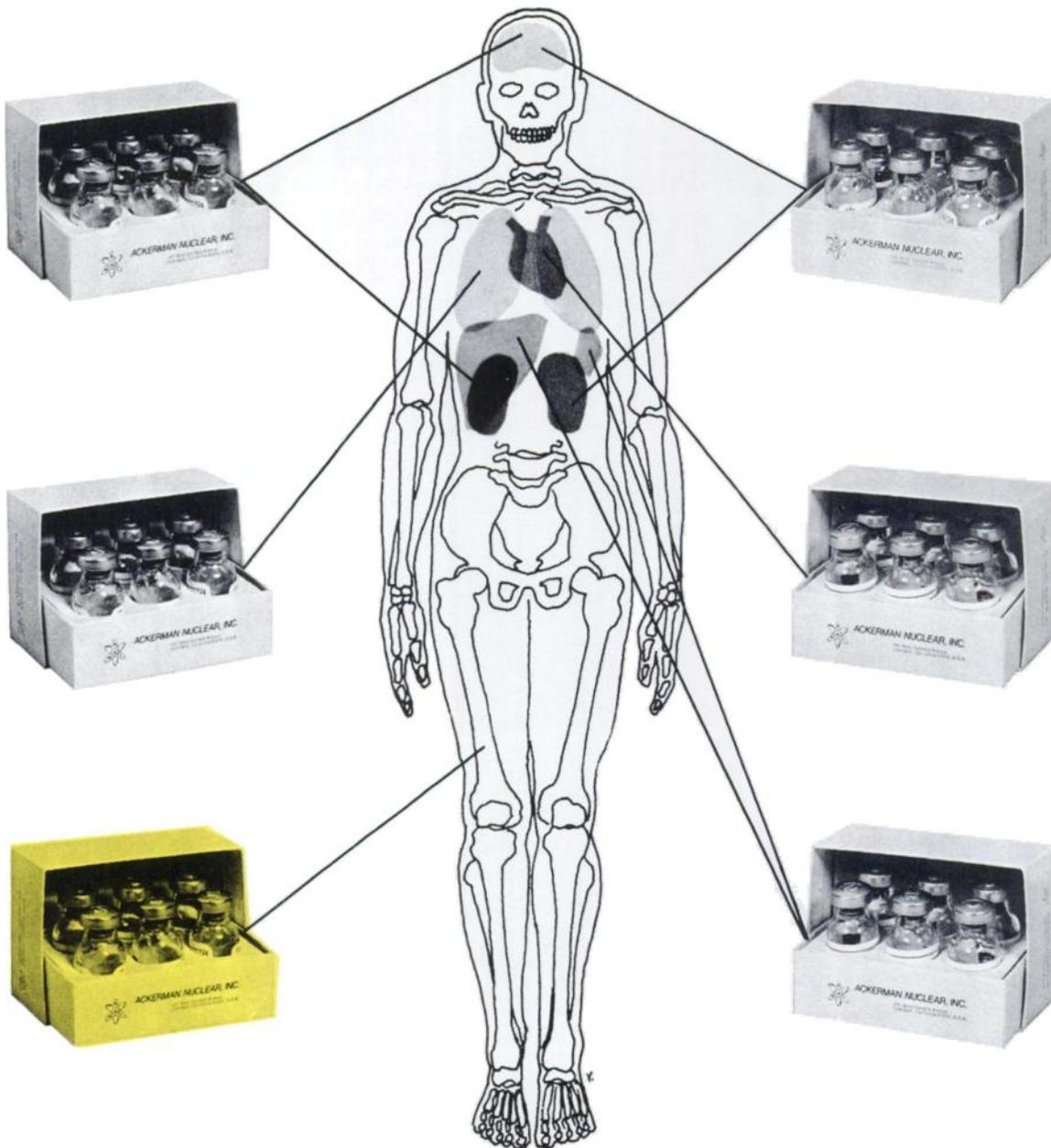
**HARSHAW** 

HARSHAW CHEMIE B. V.,  
DeMeern, Netherlands, Telex: 47017  
HARSHAW CHEMIE, G.m.b.H.,  
Federal Republic of Germany, Telex: 8513306

\*Walter D. Obrist, et al. *STROKE*,  
Vol. 6, May-June, 1975, pp. 245-256.

A **kewanee** INDUSTRY

Visit us at Booth #238 in Atlanta, at the SNM show



## A Well Organized System

The organ and skeletal systems of the body make up a magnificent, well organized system of highly specialized components, each of which provides efficient and dependable functions.

ACKERMAN NUCLEAR INC.'s only function is to specialize in the development, refinement and production of Cold Kit imaging reagents, because we believe that kind of specialization produces the most efficient and dependable results.

ACKERMAN NUCLEAR INC. is the only company in the field whose sole business is producing Cold Kit imaging reagents. The ultimate organized system will be a kit for each organ and function of the body. We are making progress toward this goal with the largest variety of Cold Kits in the nuclear medicine industry.

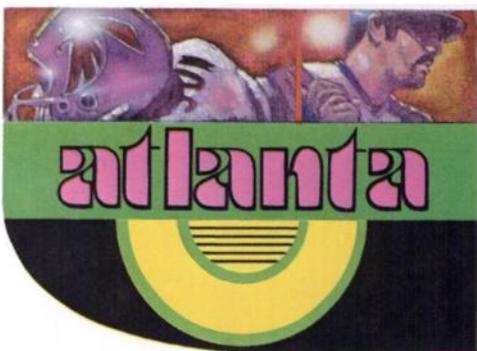
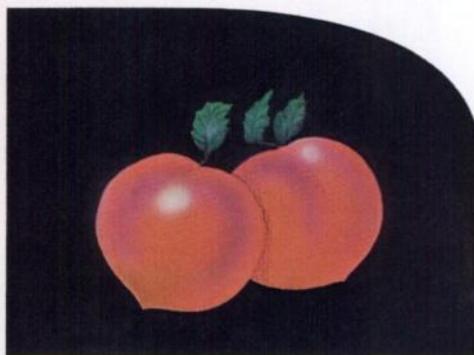
For more detailed information, call or write:



**ACKERMAN NUCLEAR, INC.**

Pharmaceuticals for Nuclear Medicine  
445 West Garfield Avenue  
Glendale, California 91204, U.S.A.  
(213) 246-2555

# Peaches & Cream



Informathek States, Inc. welcomes the S.N.M. to our hometown —Atlanta! While in the “peachtree city” be sure to visit our exhibit—Island Q—and discover the “cream” of clinical data processing systems!

**i**  
**Informathek**

STATES INC.  
302 Research Drive  
Technology Park/ATLANTA  
Norcross, GEORGIA 30092 - U.S.A.  
Tel.: 404-449-0130, Telex: 0708426

BELGIUM  
Mechelsesteenweg, 196  
ANTWERPEN - BELGIQUE  
Tel.: (031) 16 03 64

EUROPE  
Avenue d'Amazonie  
Z.A. de Courtaboeuf  
B.P. 81  
91401 ORSAY FRANCE  
Tel. (1) 907.64.18/Telex 691628

JAPAN  
1-1, Nihombashi Odemmacho  
2-chrome, Chuo-Ku  
TOKYO, 103  
Phone (03) 662-8151/Telex J221

**CLINICAL DATA PROCESSING SYSTEMS**

# DYCOMETTE

THE COST-EFFECTIVE CLINICAL PROCESSOR  
DESIGNED FOR YOU



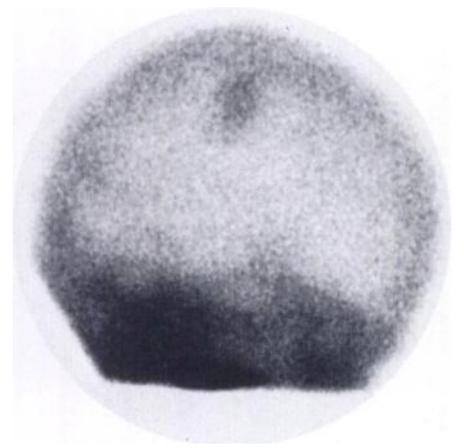
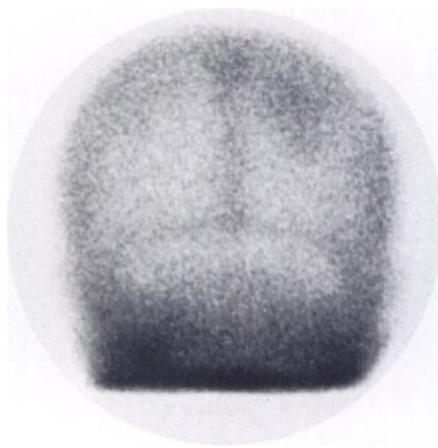
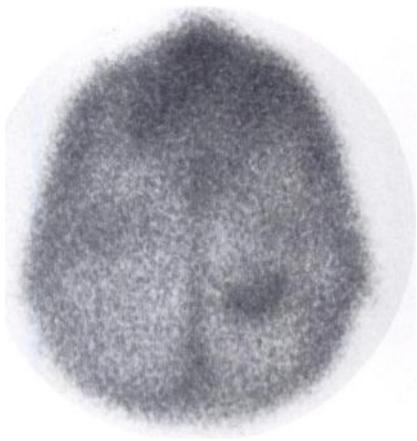
- DYCOMETTE offers you the greatest processing capability available today, for your dollar.
  - DYCOMETTE speaks your language — functional keys eliminate need for complex computer codes. So simple, anyone can learn to operate it in hours.
  - High data capacity, fast access time, simple filing, ample storage on floppy disks.
  - Total built-in capability for radiocardiology, including multigated studies at up to 48 frames per cycle, first pass studies, calculation of ejection fraction, cardiac output, shunts and other parameters of major clinical significance.
  - Clinical programs for lung, brain, kidney and other studies.
  - Ability to learn your most frequent procedures and perform them any time later upon command.
  - Full 16 color and 64 gray scale display.
  - Hard copies — on X-ray film and color prints.
  - Compatible with all makes of Gamma Camera.
- If you are cost-effective minded, let us show you what DYCOMETTE can do.  
Call or write today for demonstration or full information.

elscint

The ELSCINT commitment to excellence

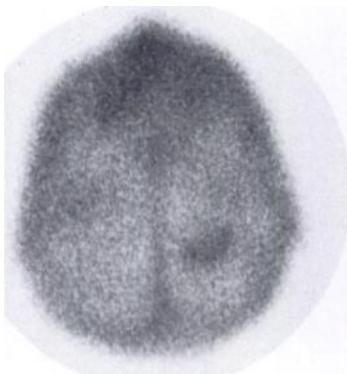
**U.S.A.** ELSCINT INC. 138-160 Johnson Avenue, Hackensack, New Jersey 07602, Tel. : 201-487-5885 ; Telex : 135382.  
**Germany** : Elscint GmbH, Freudenbergstrasse 27, 62 Wiesbaden-Schierstein. **U.K.** : Elscint (GB) Ltd. 5 Priestley Way, Crawley, Sussex RH10 2DW.  
**Belgium** : Elscint N.V./S.A. Rue du Saphir 31, B-1040 Brussels. **Holland** : Elscint B.V. Raadhuislaan 12B, Maarn. **Brazil** : Elscint, Rua Dos Moras, 576 Alto De Pinheiros, 05434 Sao Paulo. **Italy** : Elscint S.R.L., Via F. Lli Zoia 75, 20152, Milano. **Israel** : Elscint Ltd., P.O.Box 5258, Haifa.  
**In other countries** — write to: **Elscint International Sales & Service Division, Elscint - I.S.S.D.**, Annandale, North End Road, Golders Green, London NW 11 7QY. **U.K.**

**“Glucoheptonate  
offers...”**

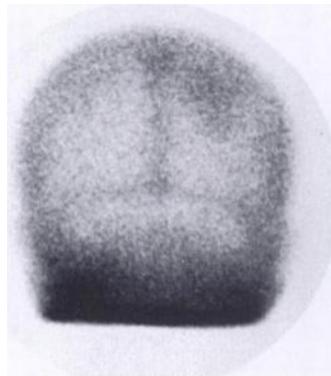


# ...a significant improvement in

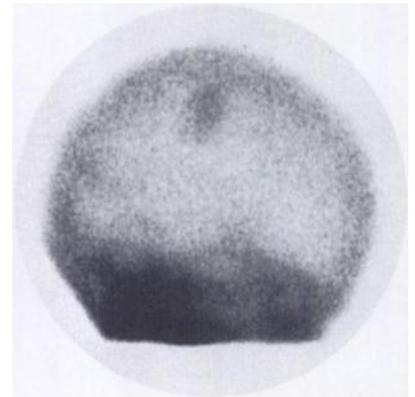
Glucaptate Sodium



Vertex

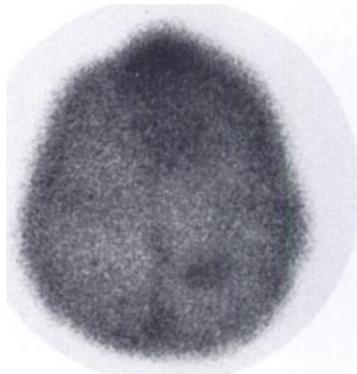


Posterior

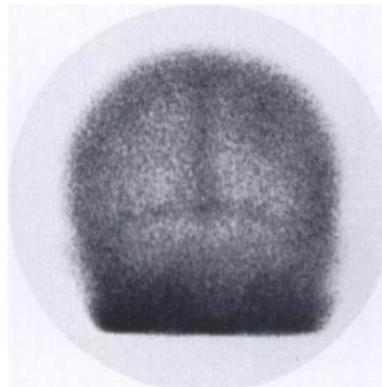


Right Lateral

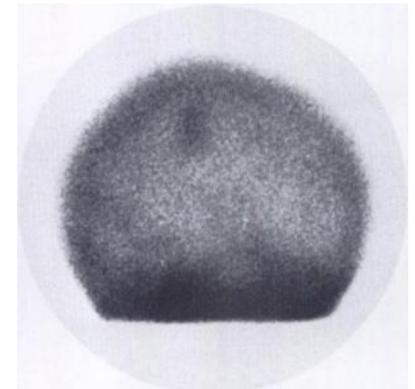
Sodium Pertechnetate



Vertex



Posterior



Right Lateral

A 67-year-old female patient was referred for a brain scan two weeks following bilateral carotid endarterectomy, shortly after onset of left-sided weakness and slurred speech.  $^{99m}\text{Tc}$  glucaptate sodium images made two hours postinjection clearly demonstrate several areas of abnormally increased uptake in the right parietal and temporal regions, yielding the impression of multiple emboli. A repeat study with  $^{99m}\text{Tc}$  sodium pertechnetate made five days later at three hours postinjection revealed the same lesions, although the lower target-to-background ratio of sodium pertechnetate clearly diminishes appreciation of abnormal areas.

# lesion detection.’<sup>3</sup>

## **Considered superior to sodium pertechnetate, DTPA**

Published studies by Léveillé et al<sup>1</sup>, Rollo et al<sup>2</sup> and Waxman et al<sup>3</sup> compared Technetium Tc 99m gluceptate sodium (glucoheptonate) to sodium pertechnetate and/or Technetium Tc 99m DTPA. Their findings:

## **24% higher target-to-background ratio**

“The results of the computer background study for <sup>99m</sup>Tc GH versus <sup>99m</sup>TcO<sub>4</sub> show an average calvaria/brain ratio of 2.1 and 1.6 for <sup>99m</sup>Tc GH and <sup>99m</sup>TcO<sub>4</sub>, respectively, at 90 minutes after injection.” Rollo et al<sup>2</sup>

## **May detect lesions not seen with other agents**

“... <sup>99m</sup>Tc glucoheptonate concentrates in all lesions which accumulate <sup>99m</sup>TcO<sub>4</sub> or <sup>99m</sup>Tc DTPA, and in certain cases, appears to localize lesions which do not concentrate other agents.” Rollo et al<sup>2</sup>

When compared to pertechnetate . . . “Glucoheptonate offers a significant improvement in lesion detection (for both infarcts and tumors).” Waxman et al<sup>3</sup>

## **Optimal imaging at 90 minutes postinjection, without KClO<sub>4</sub>**

“<sup>99m</sup>Tc glucoheptonate combines the absence of oral activity with the convenience of obtaining highly diagnostically accurate images at 90 minutes.” Rollo et al<sup>2</sup>

1. Leveillé J et al: Technetium-99m glucoheptonate in brain-tumor detection: An important advance in radiotracer techniques. J Nucl Med 18 (10):957-961, 1977.

2. Rollo FD et al: Comparative evaluation of <sup>99m</sup>Tc GH; <sup>99m</sup>TcO<sub>4</sub>; and <sup>99m</sup>Tc DTPA as brain imaging agents. Radiology 123:379-383, 1977.

3. Waxman AD et al: Technetium 99m glucoheptonate as a brain scanning agent: A critical comparison with pertechnetate. J Nucl Med 17 (5):345-8, 1975.

**GLUCOSCAN**<sup>TM</sup>  
Technetium Tc 99m Glucoceptate Sodium Kit

**NEN** New England Nuclear®

See following page for full prescribing information.

# GLUCOSCAN

## Technetium Tc 99m Gluceptate Sodium Kit

May 1978

FOR DIAGNOSTIC USE

**DESCRIPTION:** New England Nuclear's GLUCOSCAN™ Technetium Tc 99m Gluceptate Sodium Kit is supplied sterile and non-pyrogenic in lyophilized kit form suitable for reconstitution with sodium pertechnetate Tc 99m to form a diagnostic imaging agent for intravenous administration. Each vial contains 200mg gluceptate sodium, 0.07mg maximum tin and 0.06mg (min.) stannous chloride. Prior to lyophilization, hydrochloric acid and/or sodium hydroxide solution may be added to adjust the pH.

### PHYSICAL CHARACTERISTICS

Technetium Tc 99m decays by isomeric transition with a physical half-life of 6.02 hours (SOURCE: Martin, M.J., Nuclear Data Project, ORNL, March, 1976). Photons that are useful for imaging studies are listed in Table 1.

**Table 1. Principal Radiation Emission Data**

Radiation	Mean % / Disintegration	Mean Energy (keV)
Gamma-2	88.96	140.5

To facilitate correction for physical decay of Technetium Tc 99m, the fractions of initial activity that remain at selected intervals after the time of calibration are shown in Table 2.

**Table 2. Technetium Tc 99m Physical Decay Chart; Half-Life 6.02 Hours**

Hours	Fraction Remaining	Hours	Fraction Remaining
0*	1.000	5	.562
1	.891	6	.501
2	.794	7	.447
3	.708	8	.398
4	.631		

\* Calibration Time

### EXTERNAL RADIATION

The specific gamma ray constant for Technetium Tc 99m is 0.8R/mCi-hr at 1 cm. The first half-value thickness of lead (Pb) is 0.2mm. A range of values for the relative attenuation of the radiation emitted by this radionuclide that results from interposition of various thicknesses of lead is shown in Table 3. For example, the use of a 6.3mm thickness of lead will attenuate the radiation by a factor greater than 10<sup>-6</sup>.

**Table 3. Radiation Attenuation by Lead Shielding**

Shield Thickness Lead (Pb) mm	Coefficient of Attenuation
0.2	0.5
0.95	10 <sup>-1</sup>
1.8	10 <sup>-2</sup>
2.7	10 <sup>-3</sup>
3.6	10 <sup>-4</sup>
4.5	10 <sup>-5</sup>
5.4	10 <sup>-6</sup>
6.3	10 <sup>-7</sup>

**CLINICAL PHARMACOLOGY:** Technetium Tc 99m Gluceptate Sodium has been shown by comparative renograms to concentrate in the kidney by both glomerular filtration and tubular secretion. Kinetic studies have shown that while some of the activity is rapidly cleared through the urine, the remainder is retained in the renal cortex. In humans, about 25% of the injected dose is excreted in the urine during the first hour post-injection. Within the same interval, blood activity rapidly clears to less than 2% of the injected dose.

Technetium Tc 99m Gluceptate Sodium has also been shown to localize in areas of intracranial pathology characterized by a disturbance in the blood brain barrier. The mechanism is probably non-specific since neoplasms,

cerebrovascular accidents and extracerebral hematomas have all shown pronounced radionuclide uptake. Used in conjunction with dynamic flow studies, Technetium Tc 99m Gluceptate Sodium may detect vascular stenoses and arteriovenous malformations. There is no concentration of the agent by the salivary glands or the choroid plexus.

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

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

**CONTRAINDICATIONS:** None known.

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

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

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

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

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

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

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

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

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

Safety and effectiveness in children have not been established.

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

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

Technetium Tc 99m Gluceptate Sodium should be used within eight hours after aseptic reconstitution with sodium

pertechnetate Tc 99m. For optimal results, this time should be minimized. The reaction vial contains no bacteriostat.

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

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

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

### RADIATION DOSIMETRY

The estimated radiation absorbed doses to an average adult patient (70kg) from an intravenous injection of a maximum dose of 20 millicuries of Technetium Tc 99m Gluceptate Sodium are shown in Table 4.

**Table 4. Radiation Absorbed Doses**

Tissue	Absorbed Dose Rads/20 millicuries
Kidneys	3.40
Liver	0.20
Bladder Wall	5.60
Ovaries	0.32
Testes	0.20
Whole Body	0.15

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

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

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

**INSTRUCTIONS FOR PREPARATION OF TECHNETIUM Tc 99m GLUCEPTATE SODIUM KIT:** Aseptically inject 3 to 7ml of sodium pertechnetate Tc 99m into the supplied vial of GLUCOSCAN after placing vial in a radiation shield. Swirl for several seconds to dissolve completely. Label shield appropriately. Use within eight hours of reconstitution.

Using proper shielding, the vial containing the reconstituted solution should be visually inspected to insure that it is clear and free of particulate matter.

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

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

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

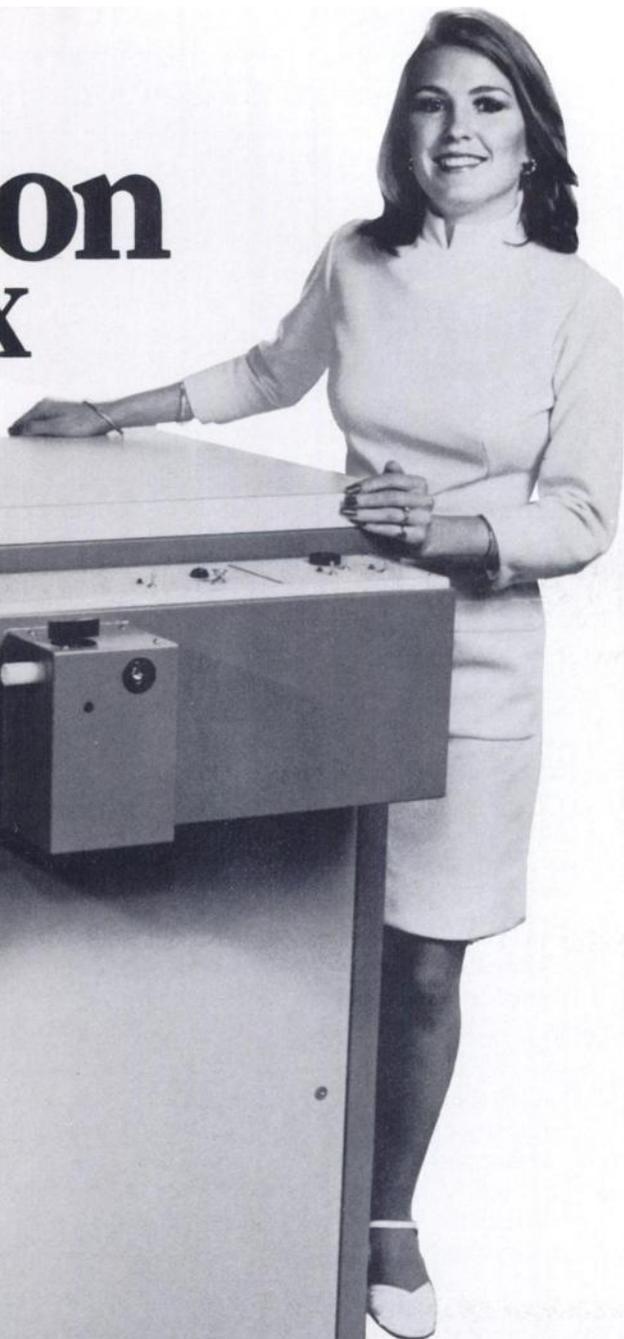
**NEN** New England Nuclear  
Medical Diagnostics Division  
601 Treble Cove Rd., North Billerica, MA 01862

CALL TOLL-FREE: 800-225-1572 Telex: 94-0996 (In Massachusetts and International: 617-482-9595)

Canada: NEN Canada, 2453 46th Avenue, Lachine, Que. H8T 3C9 Tel: 514-636-4971

Europe: NEN Chemicals GmbH, D-6072 Dreieich, W. Germany, Postfach 401240 Tel: (06103) 85034 Order Entry: (06103) 81013

# NEW THE XenaCon FROM RADX



A spirometer xenon rebreathing device for less than \$2500!!! Impossible? Almost, but we did it! We used the technology and know-how gained from 5 years of experience with the Ventil-Con and created the first low-cost spirometer xenon unit.

**XenaCon I** basic spirometer unit

**XenaCon II** spirometer unit with built-in Xenon Trap

**XenaCon III** spirometer unit with Xenon Trap and Xenon Trap Exhaust Port Monitor detector/alarm system

## PERTINENT SPECIFICATIONS

**Mobility:** all units are highly mobile, making bedside studies practical

**Unit dead space:** less than 25 ml in both washout and rebreathing

**Spirometer volume:** 0-10 liters

**Breathing resistance:** less than 0.1 inch of water to normal breathing

**Shielding:** spirometer area — ½ inch lead trap area — ¼ inch lead

**Oxygen replenishment:** manual pushbutton valve

**Xenon injection port:** located in head valve for either direct bolus or homogeneous mixture patient administration

**Bacteriological filter:** inline autoclavable bacteriological filter

**CO<sub>2</sub> trap:** high capacity, easy access CO<sub>2</sub> trap

**Xenon trap cartridge pack:** New vertical activated Charcoal cartridge pack eliminates channeling

For more information, call or write Radx today.

## **RADX**

P.O. Box 19164 • Houston, Texas 77024  
713-468-9628

# Inner-View No. 3

*A continuing educational series in Nuclear Cardiology*



*The interview excerpted here was conducted with Gerald S. Johnston, M.D., Chief of Nuclear Medicine, Clinical Center of the National Institutes of Health, Washington, D.C.*

**Q. Dr. Johnston, what observations have come from N.I.H. work with multiple gated blood pool studies?**

**A.** The equilibrium method is a much more reliable test than the traditional ECG method. Patients with forms of aortic stenosis, whose resting ejection fractions are higher than normal, experience a drop in ejection fraction during exercise. Following correction of the stenotic lesion, the ejection fraction rises. With exercise there is an improvement in the ejection fraction of patients who have had coronary bypass surgery, indicating that patients can benefit from this operation. Studying patients with aortic insufficiency has provided some hope that the nuclear method may be helpful in selecting the optimal time for valvular replacement.

**Q. Comparing multiple gated studies with thallium studies, which in your opinion are easiest to interpret?**

**A.** They are both relatively easy to interpret once the observer has had some experience with them. Because the thallium studies are stationary studies, the subtleties of a very minor lesion might escape you. Because the wall is moving in an equilibrium study, you should be able to pick up very subtle lesions. Therefore, either would be relatively easy to interpret, but probably the equilibrium study would be the easiest.

**Q. Which of the two studies yields the most diagnostic information?**

**A.** The equilibrium study gives you more information. The thallium study will show a wall defect if there is an infarct or marked ischemia. However, deficiencies in coronary flow are a bit harder to pick up where myocardial function is still intact. When comparing a rest and exercise equilibrium study, slight abnormalities can be readily observed.

**Q. What particular advantages do nuclear cardiology studies have over other methods in the evaluation of heart disease?**

**A.** These procedures are less invasive and provide global and regional functional information. Contrast studies are more invasive. In addition, a significant amount of radiation is required for contrast studies so that repeating them is not taken lightly. Once the initial

baseline nuclear cardiology information is obtained from a patient, one would then be in a position to follow the patient's status and see if he was improving as a result of treatment. This is one of the big advantages of these methods, particularly the equilibrium approach.

**Q. In your research, how do these tests correlate with cineangiography?**

**A.** We find that the nuclear cardiology data correlates very well with coronary catheterization and contrast angiography data. The three dimensional nuclear data gives us an edge over contrast angiography's two-dimensional view. In all probability, nuclear cardiology studies will become the standard with which to judge contrast angiography.

**Q. As you look to the future, is nuclear cardiology going to become the primary diagnostic method in cardiac disorders?**

**A.** When you are involved with nuclear cardiology, it seems like that may well be the case. A considerable amount of effort is going into simplifying the computerized aspects of nuclear cardiology as well as improving the detector devices. However, considering the large amount of information gained in exchange for the small dose of radiation that is involved in this method, I think that nuclear cardiology has the potential of being one of the primary methods used in cardiology.

For the complete transcript of this interview with Dr. Johnston, write Inner-View, General Electric Company, Medical Systems Division, P.O. Box 414 (Mail Code W-504), Milwaukee, WI 53201.

General Electric Medical Systems, Milwaukee, Toronto, Madrid.

**GENERAL  ELECTRIC**

Visit us at booth "F" in Atlanta, at the SNM show

Medi-Ray announces . . .

# SURVEY METER

## CALIBRATION and REPAIR SERVICE

The Medi-Ray Survey Meter Calibration and Repair Service is designed to provide reliable, competent calibration and repair for the areas of Nuclear Medicine, Radiology, Research and Industry. Our service incorporates the latest techniques and facilities, as well as a staff of highly qualified personnel functioning in the latest and most modern of environments. The result is the highest quality service at a reasonable cost to the customer.

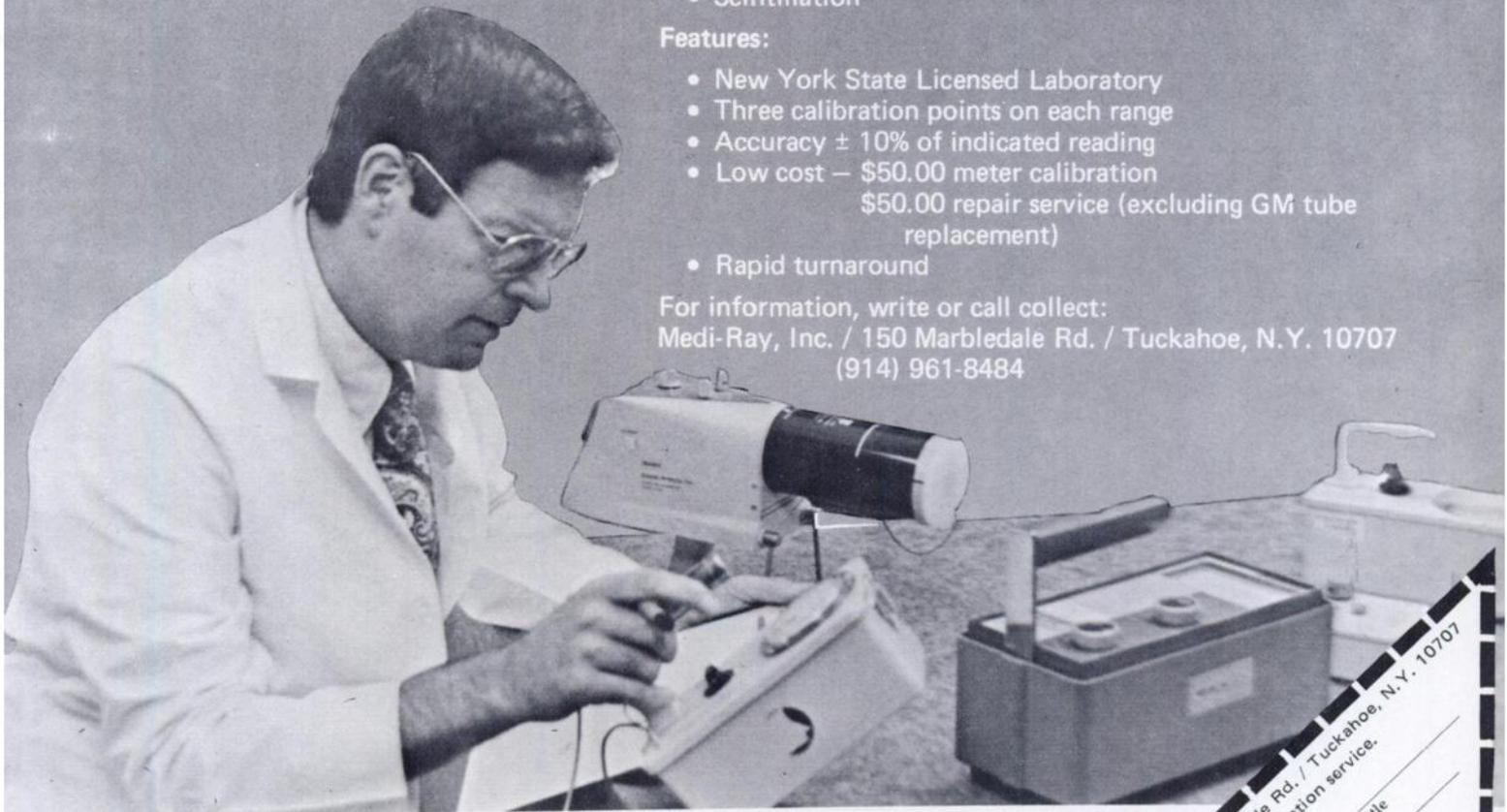
### Types of Meters:

- Ionization Chamber
- Geiger — Mueller
- Scintillation

### Features:

- New York State Licensed Laboratory
- Three calibration points on each range
- Accuracy  $\pm 10\%$  of indicated reading
- Low cost — \$50.00 meter calibration  
\$50.00 repair service (excluding GM tube replacement)
- Rapid turnaround

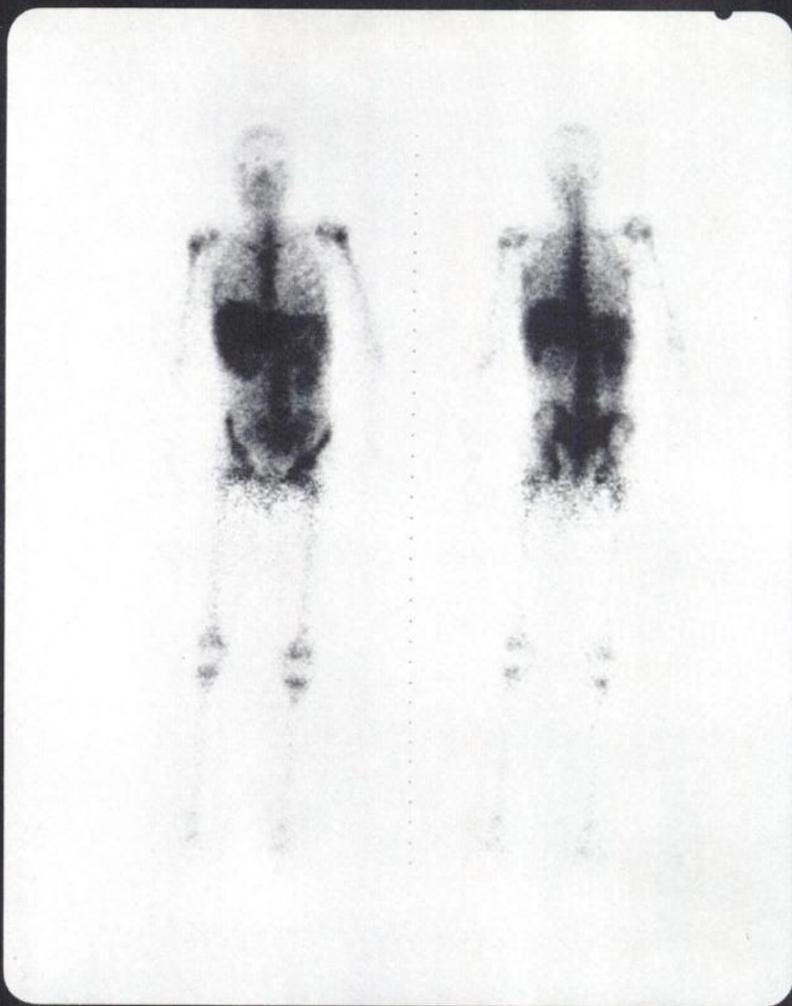
For information, write or call collect:  
Medi-Ray, Inc. / 150 Marbledale Rd. / Tuckahoe, N.Y. 10707  
(914) 961-8484



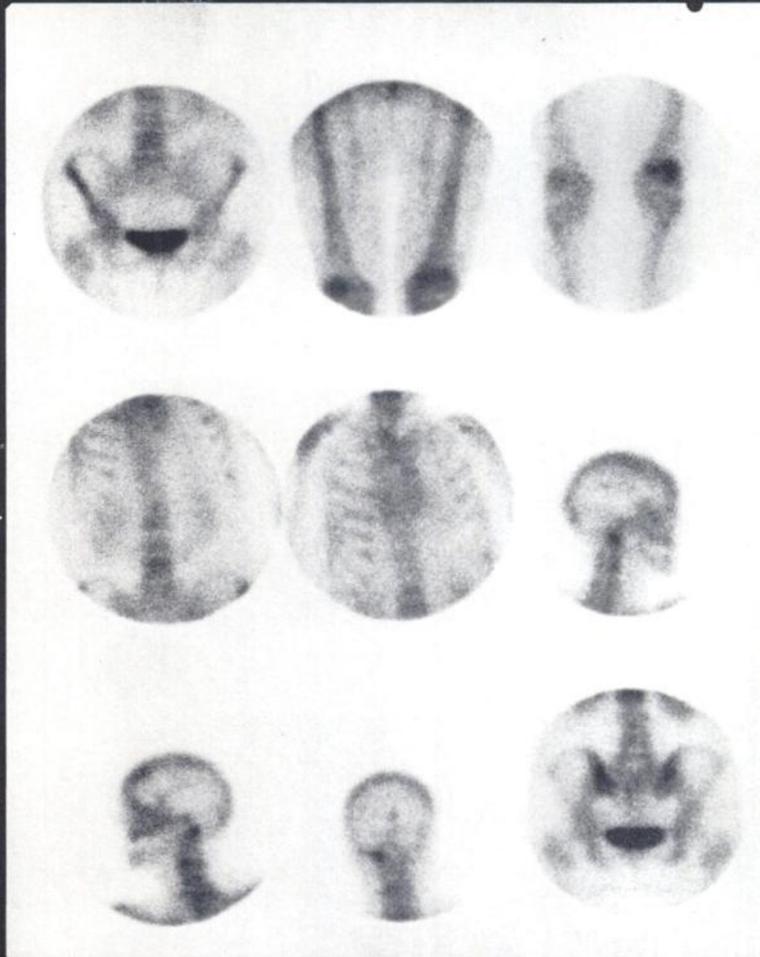
# Medi-Ray, Inc.

Medi-Ray, Inc. / 150 Marbledale Rd. / Tuckahoe, N.Y. 10707  
Please send information on calibration service.

Name	_____	Title	_____
Hospital	_____	Dept.	_____
Address	_____	City	_____
State	_____	Zip	_____
Phone	_____		_____



# **NUCLEAR IMAGES ON *KODAK* FILM: SHARP.**



# INFORMATIVE. DURABLE.

Obtaining high-quality images in nuclear medicine requires both skilled personnel and valuable time. Reason enough to record the information you require on Kodak NMB or NMC film.

**Sharp.** Kodak NMB (blue base) and NMC (clear base) films feature single-coated emulsions to eliminate parallax. Since they are orthochromatic and, therefore, sensitive to both blue and green CRT phosphors, they record all the information on blue or green cathode-ray tubes. The built-in halation control provides for the imaging of crisp sharp dots, resulting in images with clearly defined edges.

**Informative.** Whether you use a multi- or single-image format, Kodak NMB and NMC films have the "view-box" quality that no other medium can match. The inherent contrast level and excellent resolution of these films enable dot concentration patterns to image both flow and uptake studies effectively.

**Durable.** Both films are coated on a tough 7-mil Estar base. These films resist curling or cracking and can form a convenient and reliable part of a patient's record for years to come.

Kodak NMB and NMC films can be processed in 90 seconds and are available in a variety of sheet film sizes. If you would like to know more about these and other Kodak films for nuclear medicine, ask your Kodak Technical Sales Representative, or write: Eastman Kodak Company, Health Sciences Markets Division, Dept. 740-B, Rochester, New York 14650.

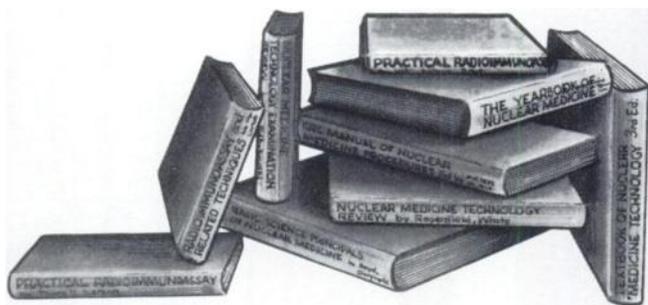
© Eastman Kodak Company, 1979

**TURNING ENERGY  
INTO IMAGES**



RADIOGRAPHY · COMPUTED TOMOGRAPHY  
ULTRASOUND · NUCLEAR MEDICINE · THERMOGRAPHY

# Time Spent on Our Kits... is Time Well Spent



With the time you save using our products, you'll have the opportunity to stay current in our rapidly expanding field and prepare for registration exams.

## ORDER:

10 kits of MAA at \$75.00 ea.

Select a book from section A or B.

10 kits of DTPA at \$28.00 ea.

or 10 kits of TCK at \$32.00 ea.

Select a book from section A.

The selected book will be sent to you free.

A) "Textbook of Nuclear Medicine Technology 3rd Ed." by Early, Razzak, Sodee

"Nuclear Medicine Technology Review" by Rosenfield, White

"Practical Radioimmunoassay" by Moss, Dalrymple, Boyd

"Nuclear Medicine Technology Examination Review" by Frey, Kulbukowski

B) "Basic Science Principals of Nuclear Medicine" by Boyd, Dalrymple

"Radioimmunoassay and Related Techniques" by Thorell, Larson

"CRC Manual of Nuclear Medicine Procedures" Ed by J.W. Keys Jr. M.D.

"The Yearbook of Nuclear Medicine" by Quinn, Spies

\* This offer is made with the belief an informed user selects the best products.

Offer expires June 30, 1979.



**CIS Radiopharmaceuticals, Inc.**

5 DeAngelo Drive / Bedford, MA 01730 / Tel: (617) 275-7120  
Outside Massachusetts (800) 225-1145 / Telex 94-9465

Visit us at Booth #116 in Atlanta, at the SNM show  
34A

## Check contamination with confidence

# HAND MONITOR HM6

- Monitors both hands simultaneously, providing alpha and beta indication
- Audible and visual indicators direct the user in all modes of operation
- Integrating techniques ensure precise measurements
- Automatic correction for high gamma background
- Gas flow or scintillation detectors to suit application

NOTE: HM6C version now available for  $^{125}\text{I}$  measurements



For full details contact:

**NE** **NUCLEAR ENTERPRISES LIMITED**

Bath Road, Beenham, Reading, RG7 5PR, England.  
Tel: 073 521 2121. Telex: 848475. Cables Devistope, Reading.

Nuclear Enterprises GmbH,  
Schwanthalerstrasse 74, 8 München 2, Germany.  
Tel: 53-62-23. Telex: 529938.

N.E. Nuclear Enterprises S.A.,  
25, Chemin Francois-Lehmann, 1218 Grand Saconnex, Geneva.  
Tel: (022) 98-16-61/62. Telex: 289066.

# If you work with radioactive Xenon, don't take chances with the air you breathe!



The only way to be sure that radioactive Xenon is not leaking into your room air is to monitor the air continuously. Use the dependable Johnston Lab Model 133 Xenon-133 gas monitor.

It easily detects Xenon-133 levels in room air, or trap output, as low as 20% of the maximum 40-hour airborne concentration ( $10\mu\text{Ci}/\text{M}^3$ ) specified by the U.S. Nuclear Regulatory Commission (100 CFR 20.103).

This reliable low cost monitor reads 0.1 to 100 MPC of Xenon-133. It features a large, easy-to-read panel meter, visual and audible alarm, and a recorder.

The recorder chart will document the exposure record of your personnel, firm proof for NRC or state inspection. This cannot be done with a meter or digital readout.

Best of all — the Johnston Lab Model 133 has been proved dependable in lab after lab, year after year.

*For price and complete specifications, write or call.*

**Johnston**  
Laboratories, Inc. 

Cockeysville, Maryland 21030  
Phone (301) 666-9500 Cable JOHNLAB

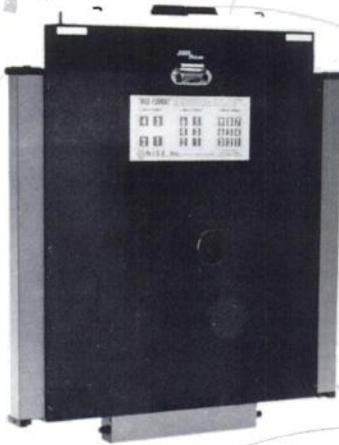
# NISE FORMAT <sup>T.M.</sup>

for true on-axis imaging!

NISE Offers the most choices in 8x10 film formatters . . . .

NISE offers the widest choice in 8x10 film formatters to meet any budget (less than \$900.00 to \$7,500.00) for C.T., Nuclear Medicine or Ultra Sound departments.

**Model '810' STANDARD Multi Format Film Back**  
· Fits on most existing Polaroid cameras · Direct on-axis, high quality images · 4 or 9 image format depending on flexibility of your Polaroid camera · 6 image format full Polaroid size · Lowest cost, rugged construction · Minimum service



**Model 'M810' DELUXE Multi Format Film Back**  
· Smaller in appearance than the STANDARD model due to improved sliding curtain design · All other features the same as our Model 810 STANDARD

**Model 'MA810' AUTOMATIC Multi Format Film Back**

· Automatic advance motor driven version of our Model 'M810' Deluxe back · Available for C.T., Ultrasound and Nuclear systems (16 positions) · L.E.D. position display



**Model 'MA810R' CONSOLE**  
· On-axis design · 4, 6 or 9 images pushbutton selected · Automatic advance at end of each exposure · Image reversal · L.E.D. position display · Can be rolled from location to location



**Model 'MA810T' TABLETOP**

· Built-in camera and monitor (on-axis) · Compact enough to be placed on a cart or your C.T., Ultrasound or Nuclear system cabinet · 4, 6 or 9 image configuration available · Compact (W=20", H=13" D=26") · L.E.D. position display



 **NISE Inc.**  
NUCLEAR INSTRUMENT SERVICES & ENGINEERING

\*U.S. Pat. No. 4,089.019  
Other foreign patents pending

20018 State Road · Cerritos, California 90701 · (213) 860-6708 · Cable: COLXFORM

Prices are F.O.B. Cerritos, California and are subject to change without notice.

Mallinckrodt

NUCLEAR

# GALLIUM CITRATE Ga 67

## Injection

### Diagnostic Sterile Solution

## ADDS A NEW INDICATION

**Lymphoma**

**Hodgkin's Disease**

**Bronchogenic Carcinoma**

**Focal Inflammatory Lesions**

**Abdominal (retroperitoneal, subphrenic) and thoracic abscesses**

**Osteomyelitis**

**Surgical or trauma wounds**

**Peritonitis**

**Cystitis**

**Active tuberculosis**

**Pyelonephritis**

Now, the precise indications for gallium-67 imaging have been expanded by Mallinckrodt to include focal inflammatory lesions...

Gallium-67 has been shown to be useful as an adjunct in the diagnosis of focal areas of infection, such as abdominal (retroperitoneal, subphrenic) and thoracic abscesses, osteomyelitis, and surgical wounds.

A positive gallium-67 study usually indicates the presence of pathology. However, care must be taken to distinguish malignant from benign lesions. A negative study cannot be definitely interpreted as ruling out the presence of disease; therefore, a negative finding should always be supported by negative clinical findings and other diagnostic procedures.

**Put Mallinckrodt Gallium Citrate Ga 67 in your active file...  
a good resource for diagnostic imaging.**

Mallinckrodt

NUCLEAR

The IMAGE MAKER

Mallinckrodt, Inc.  
St. Louis, MO 63134

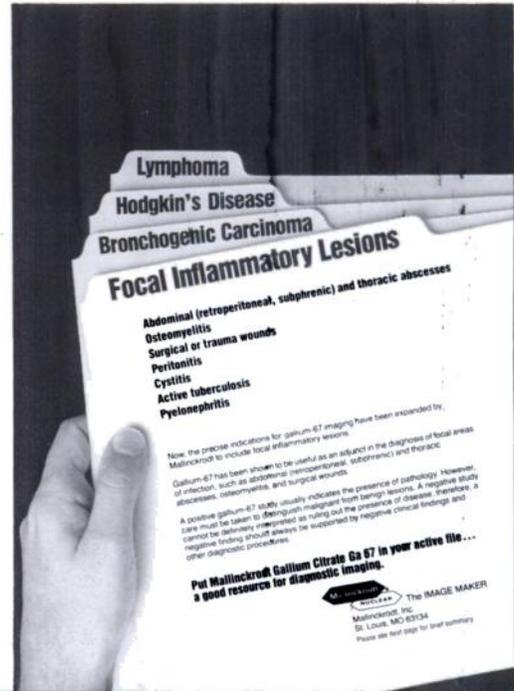
Please see next page for brief summary



# GALLIUM CITRATE Ga 67

**Injection  
Diagnostic  
Sterile Solution**

**ADDS A NEW  
INDICATION**



## **Brief Summary:**

### **INDICATIONS AND USAGE**

Gallium Citrate Ga 67 may be useful to demonstrate the presence and extent of Hodgkin's Disease, lymphoma, bronchogenic carcinoma, and focal inflammatory lesions. Positive Gallium Ga-67 uptake in the absence of prior symptoms warrants follow-up as an indication of a potential disease state.

### **CONTRAINDICATIONS**

None known.

### **WARNINGS**

Gallium Citrate Ga 67 should not be administered to children or to patients who are pregnant or to nursing mothers unless the information to be gained outweighs the potential hazards. If this drug is administered to nursing mothers, artificial feeding should be temporarily substituted for the mother's milk. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of women of childbearing capability, should be performed during the first few (approximately ten) days following the onset of menses.

### **PRECAUTIONS**

A thorough knowledge of the normal distribution of intravenous administered Gallium Citrate Ga 67 is essential in order to accurately interpret pathologic states. The finding of an abnormal Gallium Ga-67 concentration usually implies the existence of underlying pathology, but further diagnostic studies should be done to distinguish benign from malignant lesions. Gallium Citrate Ga 67 is intended for use as an adjunct in the diagnosis of certain neoplasms as well as focal areas of infection. Certain pathologic conditions may yield up to 40 percent false negative Gallium Ga-67 studies. Therefore, a negative study cannot be definitely interpreted

as ruling out the presence of disease.

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

Safety and effectiveness in children have not been established. As in the use of any radioactive material, care should be taken to minimize radiation exposure to the patient consistent with proper management and to insure minimum radiation exposure to occupational workers.

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

### **ADVERSE REACTIONS**

None have been reported.

### **DOSAGE AND ADMINISTRATION**

The recommended adult (70 kg) dose of Gallium Citrate Ga 67 is 2-5 mCi. Gallium Citrate Ga 67 is intended for intravenous administration only.

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

### **HOW SUPPLIED**

Gallium Citrate Ga 67 sterile solution is available in 3 mCi, 6 mCi and 12 mCi vials on calibration date. Each ml contains 2 mCi of Gallium Ga-67 on the calibration date, as a complex formed from 8.3 ng gallium chloride Ga-67, 1.9 mg of sodium citrate, 7.8 mg of sodium chloride, 0.9% benzyl alcohol v/v as preservative. The pH is adjusted to between 5.5-8.0 with hydrochloric acid and/or sodium hydroxide solution.

“Make  
the  
best  
available  
better!”



“Work on the ultimate, but in the meantime, make the best available better.”

Our people have always accepted the challenge and it's what makes us the leader.

We agree that all things considered the Landauer Gardray 8 film badge system is the best available personnel dosimeter. And, although we are always looking for the ultimate, we have continued to work hard and invest money and time to make it better.

Greatly simplified ordering procedures – permanently encoded unique numbering of film, which is independent of film darkening – new improved techniques for analyzing the film for anomalies that may affect the “meaning” of the exposure and new N.R.C. annual statistical summary reports available now, are just some of the ways our people are working hard to make it better for you.

Write or call for more details.

*Landauer*

R. S. LANDAUER JR. & CO. A  COMPANY  
Glenwood Science Park  
Glenwood, Illinois 60425 . (312) 755-7000

Our automated sample changer has become the "workhorse" of the RIA sector, and is respected worldwide for reliability and endurance.

### THE NEW ACTUS $^{125}$ I-f-scan™

Used in conjunction with intravenous injection of  $^{125}$ I labeled human fibrinogen,  $^{125}$ I-f-scan™ presents the most accurate, reliable system ever developed for the detection and monitoring of deep vein thrombosis of the legs. Lightweight and portable,  $^{125}$ I-f-scan™ provides a fast, safe, and simple monitoring procedure.



## ...is our well-known reputation

If you've never heard of ACTUS, Inc., it's certainly not because we're new to nuclear medicine. In fact, we've contributed to the field of Radioimmunoassay for years with some of the most respected, advanced and durable instrumentation on the market.

But until now, we've pioneered, developed and produced our instruments under someone else's label — our automated sample changer, for example, is marketed worldwide by Abbott Laboratories under the Auto-Logic tradename.

Now we're taking our reputation for quality, dependability and performance directly to you, with our innovative diagnostic fibrinogen monitor, the  $^{125}$ I-f-scan™.

A more direct role for us, the same, high-quality product for you.

In the coming months you'll be hearing a lot more about us. And our name should become a little more familiar.

ACTUS, Inc. You know us by our reputation.

For a full-color brochure detailing the new  $^{125}$ I-f-scan™ and its exclusive features, call toll free: 800-354-9875

# Behind Our Unfamiliar Name...

**ACTUS**  
7964 Kentucky Drive  
Florence, KY 41042

State-of-the-art technology in diagnostic nuclear medicine.



TM Trademark

# Puzzled...?

Sometimes the detection and evaluation of heart disease can indeed be a puzzle...you have to put all of the pieces of information together in order to make an accurate diagnosis.

And that information is often elusive... sometimes impossible to obtain without resorting to expensive and time-consuming invasive procedures.

But, now with the advent of radionuclide scanning techniques, many invasive procedures have been eliminated...or at least the absolute need for the procedure can now be determined.

The difference is decisive.

Many claims are being made for new radionuclide techniques...patient comfort...low medical costs...convenience...speed...noninvasive.

And they all operate on the same principle.

All except one.

The Cordis-Baird System Seventy-Seven<sup>®</sup> and First-Pass Technology.

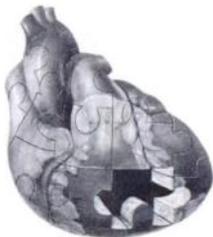
System Seventy-Seven has all of the advantages mentioned...the big difference is in data accumulation potential. The type of data that helps you make your diagnosis complete.

Write today for information and compare the data accumulation potential with all of the other systems.

You won't have to be puzzled anymore.

cordis<sup>®</sup>

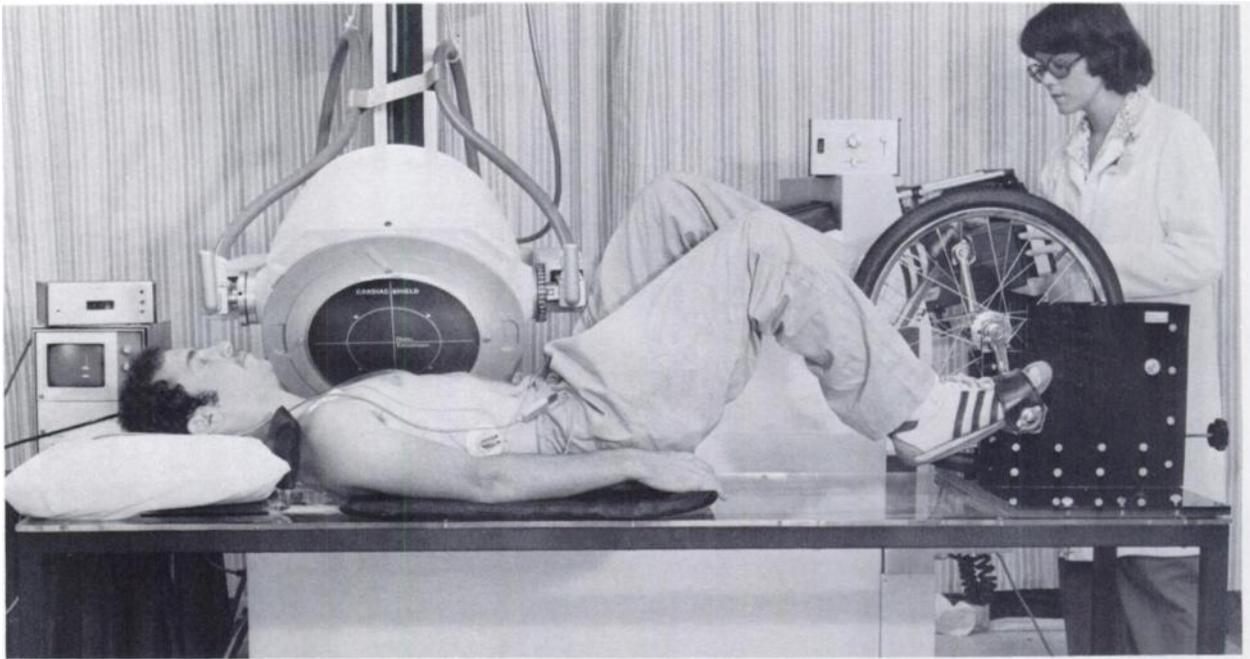
Cordis Corporation  
Nuclear Medical Systems Division  
Telephone: toll-free  
1-800-327-7820, Ext. 2711  
P.O. Box 370428,  
Miami, Florida 33137



System Seventy-Seven.  
**It's all you need to know.**



# DON'T BUY A STRESS TABLE...



## BUY A STRESS SYSTEM!

**ONEILL**  
SPECIALISTS IN  
NUCLEAR  
CARDIOLOGY

221 FELCH STREET, ANN ARBOR, MICHIGAN 48103 313/973-2335

Visit us at booths #670, 672 in Atlanta, at the SNM show

## FINALLY ... A chair for your Gamma Camera!

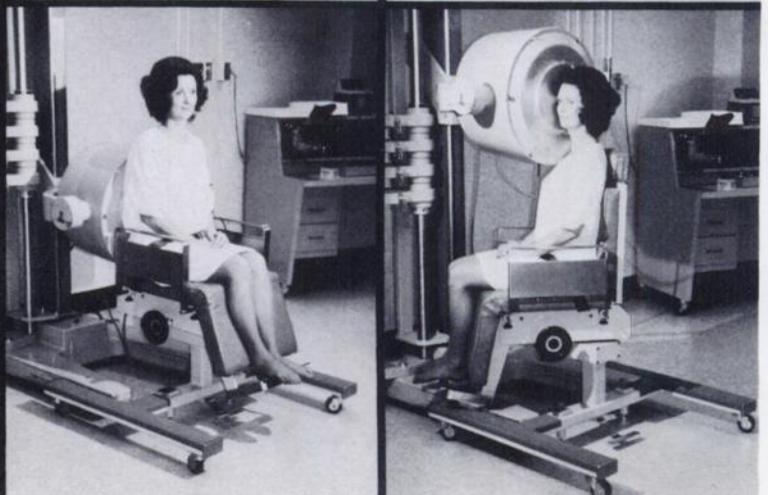
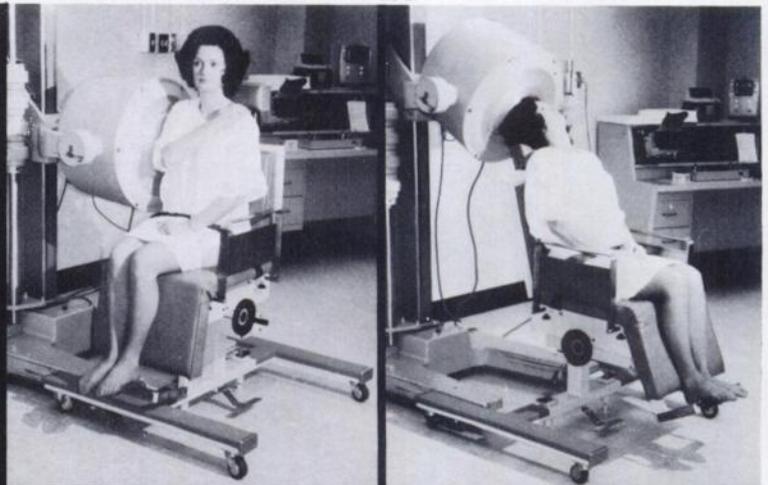
Now rapid, convenient positioning can be done on ambulatory patients for brain, lung or liver scans.

Fits all CAMERAS, requires no electrical connections, firmly locks in all positions, Patient securely held with seat belt.

Enhance your current Camera investment by reducing the time required for these predominant exams.

## HUMANETICS, INC.

214-242-2164 Box 185 CARROLLTON, TEXAS 75006



# Let's Talk Facts

...There is only one test for early and specific pregnancy detection, and that's Choriogonadotropin — Beta (HCG-B) by RIA

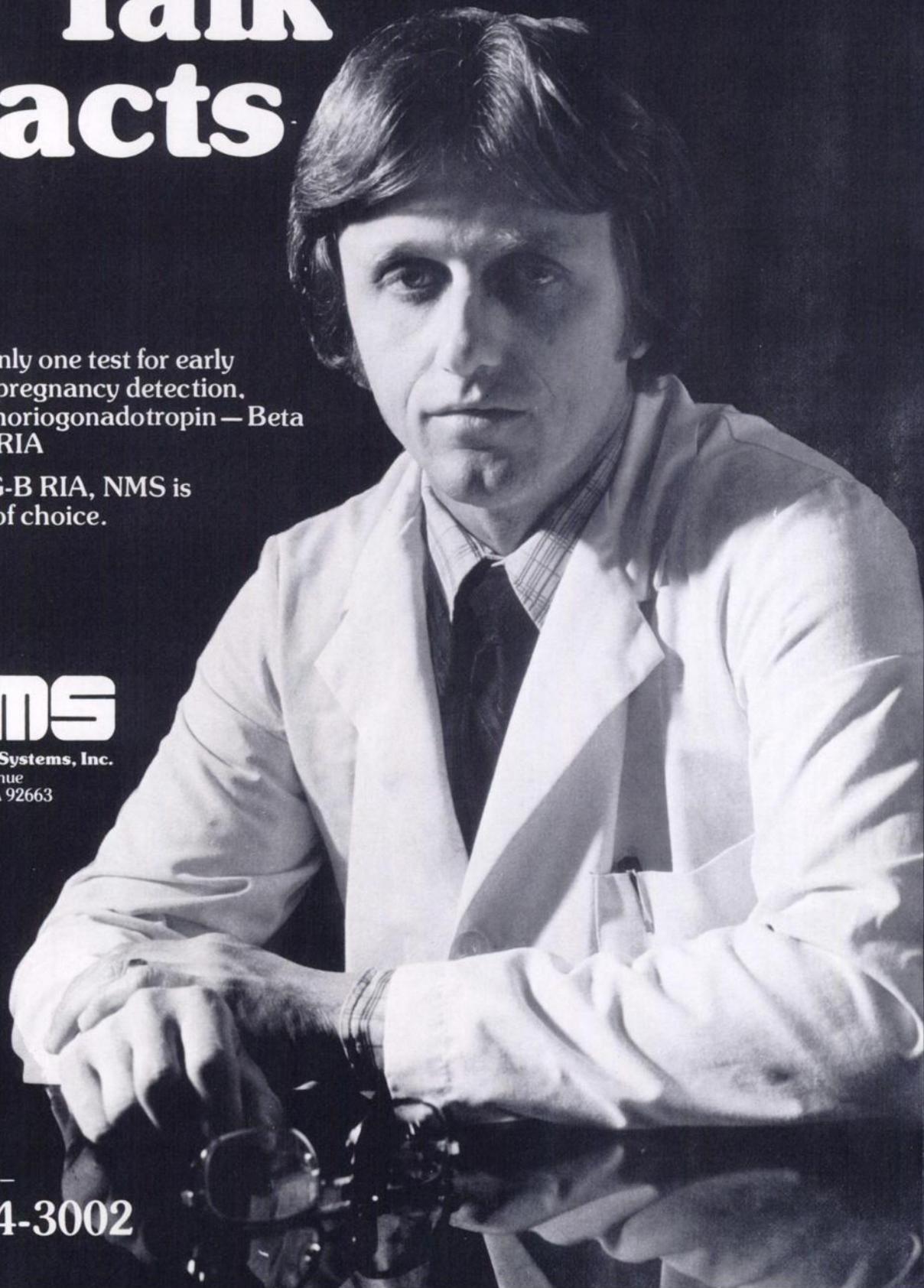
And for HCG-B RIA, NMS is the method of choice.

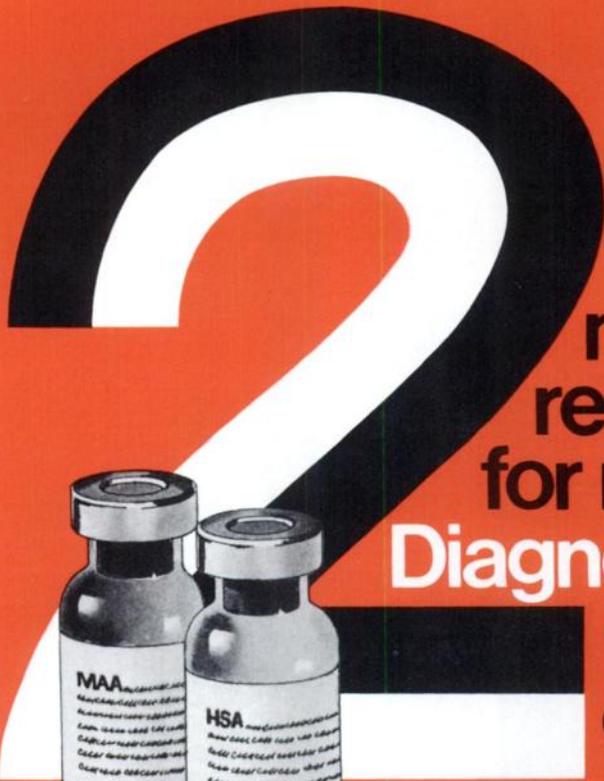


**Nuclear Medical Systems, Inc.**  
1533 Monrovia Avenue  
Newport Beach, CA 92663  
**(714) 645-2111**

Toll Free Number —

**800-854-3002**





more  
reasons  
for making  
**Diagnostic Isotopes**  
your kit  
company

**Tc 99m MAA** Aggregated Albumin Kit  
**Tc 99m HSA** Human Serum Albumin Kit

Consistent with our commitment to the needs of the nuclear medicine profession, we are proud to announce the expansion of our line of diagnostic kits to include Tc 99m MAA Aggregated Albumin Kit and Tc 99m HSA Human Serum Albumin Kit.

Each kit contains 10 multi-dose vials. All kits are available from stock and competitively priced. And since Diagnostic Isotopes offers substantial discounts for quantity orders, you now have a greater opportunity than ever to save. For instance, to earn a 10-kit quantity discount, you do not have to order 10 identical kits. Any combination of kits in a single order may earn a quantity discount. Progressive discounts are also available in orders of 25, 50 and 100 kits.

*One toll-free call to (800) 631-1260 will give you complete information on all our kits.*

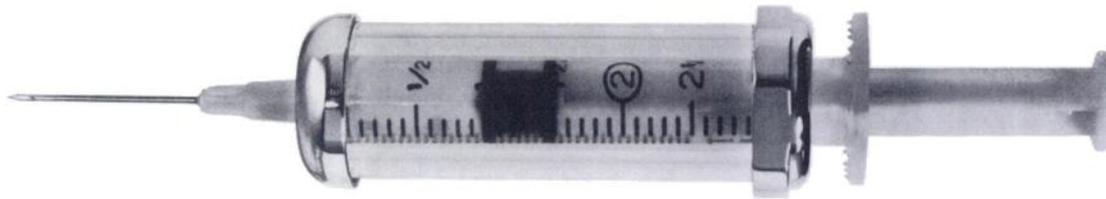
**Diagnostic Kits Available: MAA; HSA; DTPA; Polyphosphate; Diphosphonate.**



**Diagnostic Isotopes, Incorporated**

225 Belleville Avenue, Bloomfield, N.J. 07003  
in N.J. (201) 429-7590 Telex: 133393  
Call Toll Free (800) 631-1260

**Our Quality Helps Your Image.**



## Look into this syringe shield!

**Its high visibility lead glass offers the radiation protection of solid lead.**

Offering optically clear, 360 degree visibility, Nuclear Pacific syringe shields are safe, lightweight and easy to handle. Equally important, their professional appearance reduces patient anxiety.

Used extensively by hospitals world-wide, their anti-roll, no-leak design reduces radiation exposure of 99mTc

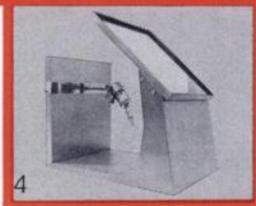


by a factor of 6 HVL. An "O" ring seal affords quick, smooth insertion and removal. Standard models in stock include 1cc, 3cc and 5cc syringes with or without Luer Locks.



Remember, for 30 years Nuclear Pacific has set the standard for visibility and protection in the radiation shielding industry.

1. Radiation shielding eyeglasses
2. Lead glass bricks
3. Vial shields
4. Radiation dose shield



**Nuclear Pacific, Inc.**

6701 Sixth Ave. S., Seattle, WA 98108  
(206) 763-2170

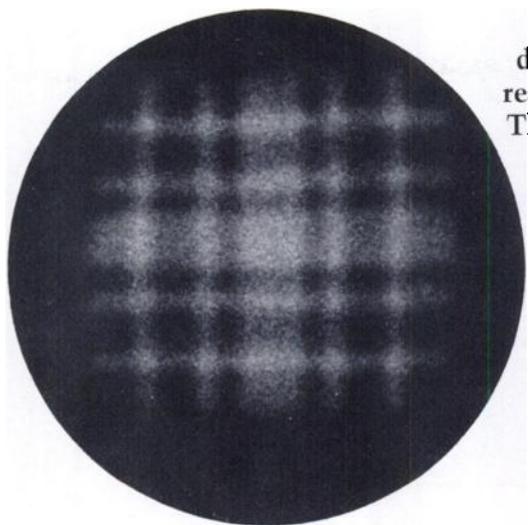
Visit us at Booth #159 in Atlanta, at the SNM show

# Gamma Camera Upgrade

**1/10 Inch or Better Resolution at a fraction of new system cost.**

## BEFORE

NEN Thallium 201 phantom at 2" distance from collimator.  
500K



Picker 2C with ultrafine collimator.

Enjoy new camera performance without a major investment. Nuclear Service Inc. can upgrade your existing gamma camera system to provide you with 1/10" or better intrinsic resolution.

With NSI upgrade you not only receive State-of-the-Art resolution, but in most cases your

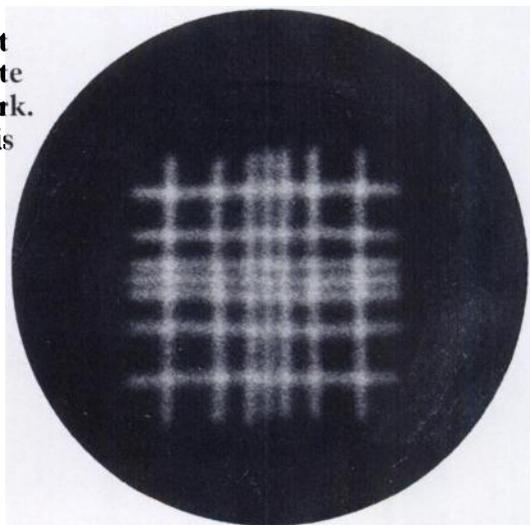
The picture on your left does not provide adequate resolution for cardiac work. The picture on the right is more than adequate!

converted system will provide you with **IMPROVED FIELD UNIFORMITY.**

Learn more about this efficient and economical method available from one of the country's largest independent nuclear medicine service organizations. Call or write NSI for complete infor-

## AFTER

NEN Thallium 201 phantom at 2" distance from collimator.  
500K



Picker 2C with ultrafine collimator and SX-11 detector head.

mation on gamma camera upgrade.

Up to 75% Better Resolution.

Picker	Improved Resolution
2	75%
2C	50%
3C, 4-12	40%
1/8"	20%

\*Leasing plans and reconditioned upgraded systems also available.

**Nuclear Services Inc.**



Nuclear Services Inc. (516) 752-9270  
P. O. Box 5492 (203) 281-3957  
Hamden, CT 06518

Visit us at booth #640 in Atlanta, at the SNM show

# thrombosis

detection of DVT using I-125 fibrinogen

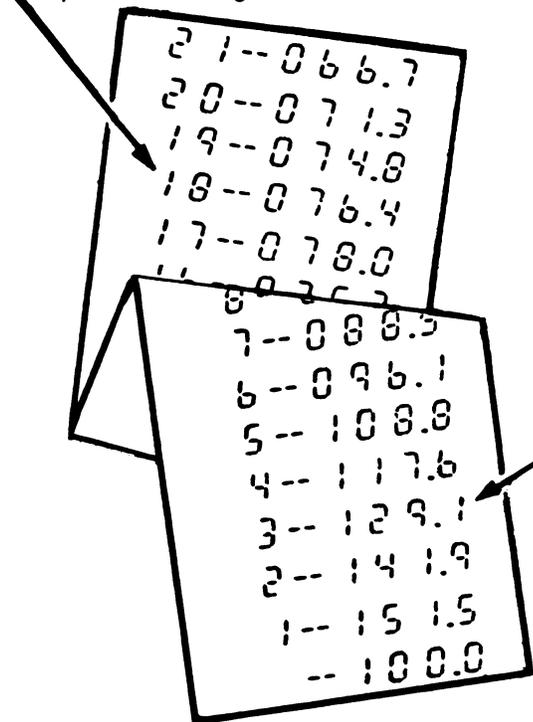
CCC-4TP



Visit us at booth 354 in Atlanta, at the SNM Show.



position on leg



percent uptake

Print Out  
1 1/4 inch wide

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



**TECHNICAL ASSOCIATES**

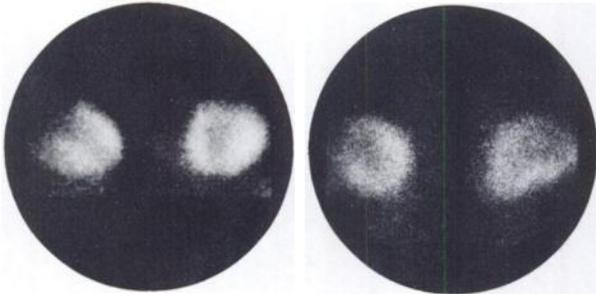
7051 ETON AVE. • CANOGA PARK, CA. 91303 (213) 883-7043

# CMS COLLIMATORS EXPAND THE DIMENSIONS OF NUCLEAR IMAGING

## CMS BILATERAL COLLIMATOR Multiple, simultaneous Thallium imaging.

CORDIS-BAIRD  
SYSTEM 77

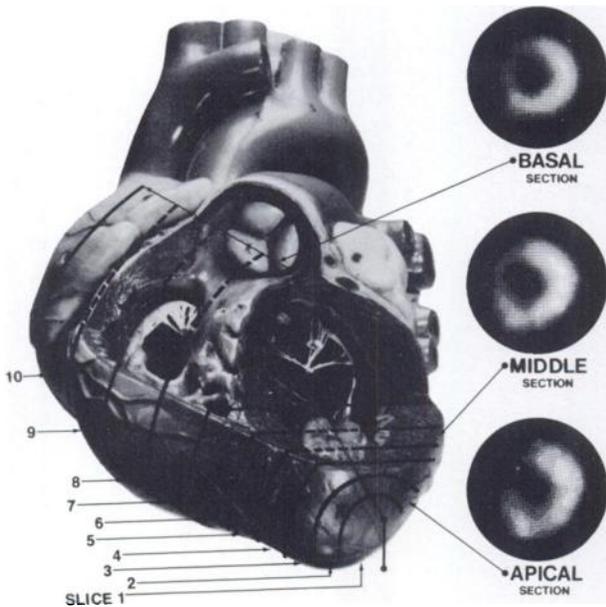
PORTABLE  
ANGER CAMERA



RAO LAO 30° LT LAT

Studies courtesy of Donald Schmidt, M.D., Mt. Sinai Medical Center, Milwaukee, and Jaroslaw Muz, M.D., Harper-Grace Hospitals, Detroit.

## CMS SCINTISLICE™ TOMOGRAPHY Multiple, simultaneous imaging.



## CMS WRITE FOR LITERATURE

Cardiac Medical Systems Corporation  
3710 Commercial Avenue, Northbrook, Illinois 60062  
Telephone (312) 564-4644

78217

Visit us at booths #166, 168, 170 in Atlanta, at the SNM show



Preserve your copies of *The Journal of NUCLEAR MEDICINE* for years of reference in a durable, custom-designed Library Case or Binder. These storage units will hold an entire 12-issue volume. The case supplied is an attractive blue with a gold-embossed spine. Each unit also includes a gold transfer so that the volume and year can be recorded.

CASE: Holds 12 issues/\$4.95 each  
three for \$14.00; six for \$24.00  
BINDER: Holds 12 issue/\$6.50 each  
four for \$25.00



TO: Jesse Jones Box Corp.  
P.O. Box 5120 Dept. JNM  
Philadelphia, PA 19141

I enclose my check or money order for \$ \_\_\_\_\_  
(Orders outside the U.S. add \$1.00 per file for postage and handling)

Please send me \_\_\_\_\_ *JOURNAL OF NUCLEAR MEDICINE*

\_\_\_\_\_ Files \_\_\_\_\_ Binders

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Note: Satisfaction guaranteed or money refunded. Allow 5 weeks for delivery.



# The Picture of Nonchalance

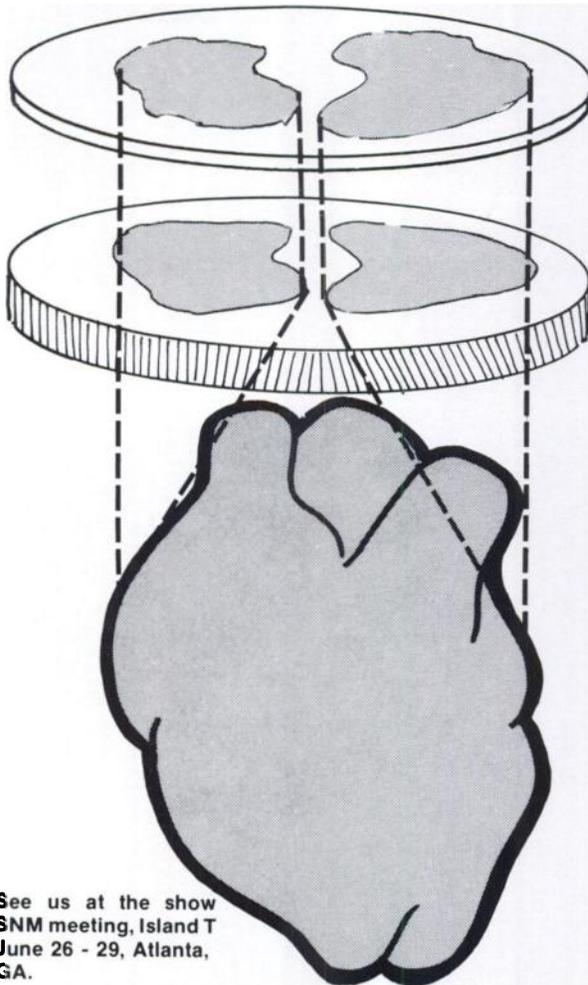
Picture the 600 Beta Series user and you will see multi-image photography so automated it's effortless. Freedom from worry about operator or camera error. And cool confidence that images of the highest quality will be recorded on film. Consistently. After all, in the practice of ultrasound, CT or any video readout imaging technique, your mind should be free to focus on the essentials: the patient, the generation of the images and the interpretation of same. The Dunn camera will work quietly in the background, to preserve those images for analysis, display and the medical record.

This requires the versatility of programmable electronics, well-engineered features like film cassette and dark slide interlocks, and the video stability and accuracy of monitors like the superb new flat-faced Tektronix 634. Let us fill in the picture for you. Call or write Dunn Instruments, Inc., 544 Second Street, P.O. Box 77172, San Francisco, California 94107. (415) 957-1600.

**The 600 Beta Series Camera  
by Dunn Instruments**

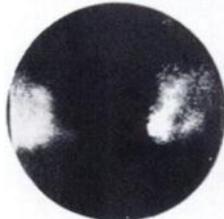


# Double Vision Double Vision



See us at the show  
SNM meeting, Island T  
June 26 - 29, Atlanta,  
GA.

## WITH THE EDC BIFOCAL DIVERGING COLLIMATOR



WITH



WITHOUT

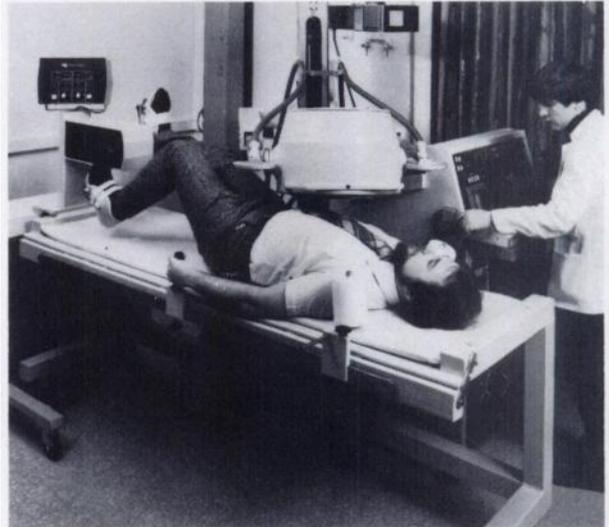
With the Bifocal Diverging Collimator, you can simultaneously record ejection fraction and wall motion from both the RAO and LAO views on 10" field-of-view camera. Both the RAO and LAO images are simultaneously viewed at an angle 50° apart, or each image is equivalent to a 25° oblique and juxtaposed on one crystal. The image integrity of the Bifocal Diverging Collimator has been clinically proven to be equal to that of parallel hole collimators. And the EDC Bifocal Collimator can be mounted in any standard or mobile gamma camera.

### EDC, the imaging experts, also offer:

- Custom and general collimators
- Ultrasonic stress unit with tilt table
- Cardiac stress system for nuclear medicine

**edc** **ENGINEERING DYNAMICS CORPORATION**  
120 Stedman Street Lowell, Massachusetts 01851  
(617) 458-1456

# Stress Images



## WITH THE EDC CARDIAC STRESS SYSTEM

The EDC Cardiac Stress System allows you to get the most significant visualization and measurement of wall motion and ventricular ejection fraction by allowing you to:

- Control and vary patient stress load
- Automatically maintain or vary patient heart rate
- Get immediate and continuous imaging during and after injection

The EDC Cardiac Stress System combines an electronically controlled pedal ergometer unit with a stable imaging table. The electronic unit lets you automatically control workload and patient heart rate during imaging. The control unit features digital displays of heart rate, workload, elapsed time, and pedal RPM. The EDC system is preferred over upright exercise machines and treadmills because the patient is immobilized and supine, permitting clear continuous imaging of the heart during stress protocol.

The EDC Cardiac Stress System is completely mobile and the imaging table can be quickly released from the pedal ergometer to permit its use with the whole body imaging cameras. The table's rigid, cantilevered design includes a radiotransparent top for posterior imaging, making it preferred for all imaging applications.

### EDC, the imaging experts, also offer:

- Custom and general collimators
- Ultrasonic stress unit with tilt table
- Cardiac stress system for nuclear medicine

See us at the show. Island T. SNM meeting. June 26-29  
Atlanta, Georgia.

**edc** **ENGINEERING DYNAMICS CORPORATION**  
120 Stedman Street Lowell, Massachusetts 01851  
(617) 458-1456

The first  
true  
direct  
one-tube  
assay

# New GammaCoat™ [<sup>125</sup>I] Free/Total T4 RIA Kit

- ◆ No Total T4 necessary
- ◆ No math required
- ◆ No additional reagents
- ◆ Bench time less than 30 minutes
- ◆ Kit can assay either Free or Total T4
- ◆ GammaCoat™ coated tube simplicity—only four steps
- ◆ No centrifugation
- ◆ Minimal manipulations
- ◆ Easily automated

Patent pending.

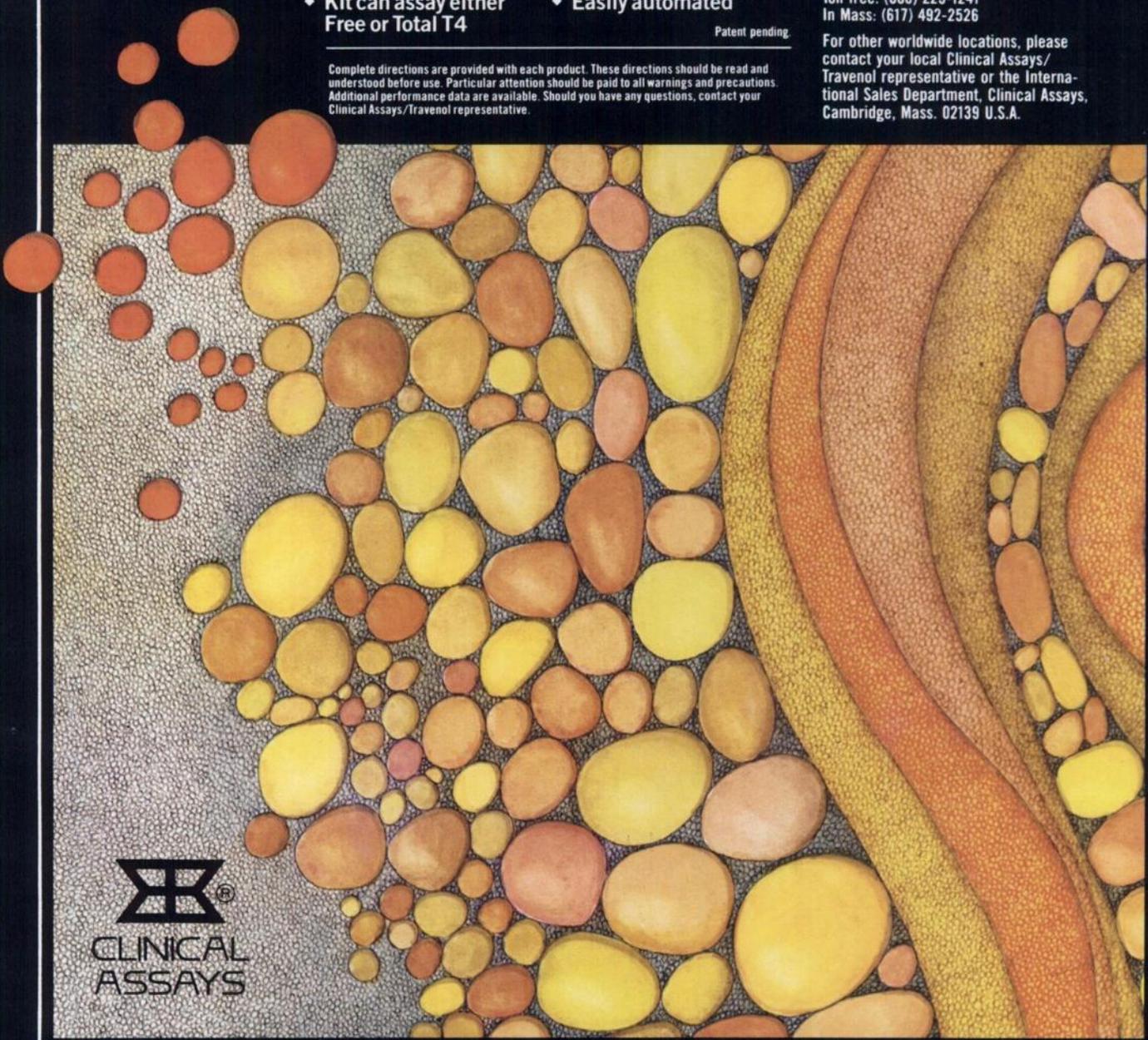
Complete directions are provided with each product. These directions should be read and understood before use. Particular attention should be paid to all warnings and precautions. Additional performance data are available. Should you have any questions, contact your Clinical Assays/Travenol representative.

Send for data sheet today.

## CLINICAL ASSAYS

DIVISION OF TRAVENOL LABORATORIES, INC.  
620 Memorial Drive, Cambridge, Mass. 02139  
(617) 492-2526 • TWX: (710) 320-6460  
Toll free: (800) 225-1241  
In Mass: (617) 492-2526

For other worldwide locations, please contact your local Clinical Assays/Travenol representative or the International Sales Department, Clinical Assays, Cambridge, Mass. 02139 U.S.A.



  
CLINICAL  
ASSAYS



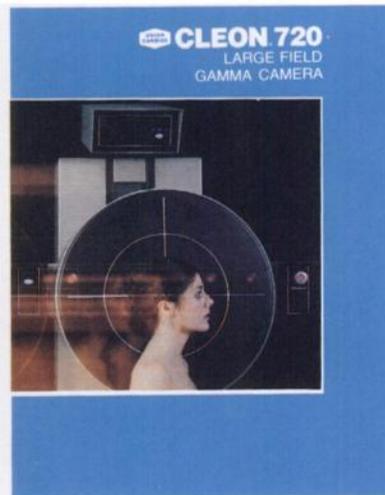
# The UNION CARBIDE Large Field Gamma Camera: **The Critical Difference in Diagnostic Power.**

The CLEON 720 Large Field Gamma Camera is a high resolution imaging system designed for exacting, contemporary clinical nuclear medicine.

It can be installed as a stand-alone camera or connected to the CLEON 110 Image Processor as an integrated imaging and data processing system.

The unique hand control lets the technologist remain with the patient at all times while setting up the complete imaging study. Bolus injection procedures can be easily accomplished with one technologist.

The optional CLEON 110 Image Processor provides a powerful microcomputer system complete with specialized Nuclear Medicine software to permit a full range of functional analyses including automatic calculation of cardiac ejection fractions, cerebral perfusion determination, renal function analysis, pulmonary function analysis, and simultaneous end-systole and end-diastole data



acquisition. The Image Processor is easy to use and requires no computer codes or terminology to operate.

### **Ask Union Carbide for the Facts**

Imaging Systems products from Union Carbide are designed to enhance

diagnosis and research, produce a return on investment, and create better health care at lower patient cost.

If you feel you should know more about this powerful new diagnostic tool, send today for descriptive literature. Or call for a personal presentation.



**See us at the SNM  
in Atlanta, Booth N**

**Touching your life  
through medicine . . .**



**Imaging Systems, Inc.  
Medical Products Division**

333 Providence Highway  
Norwood, Massachusetts 02062  
(617) 769-5400 TELEX 924-494



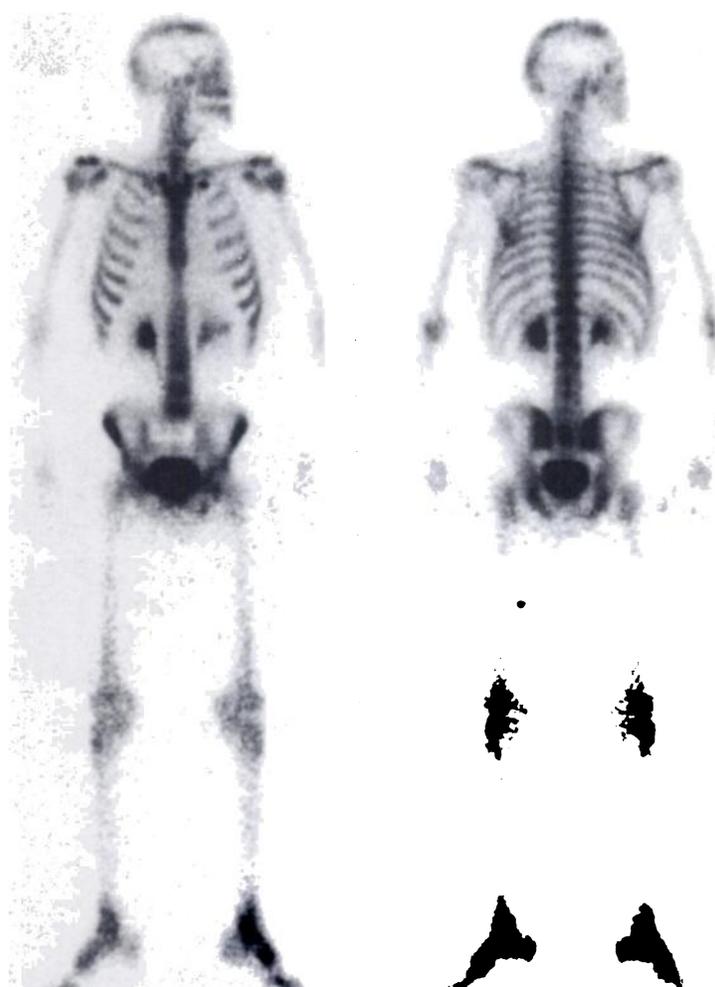
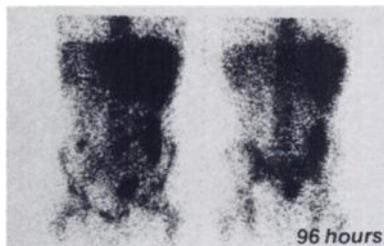
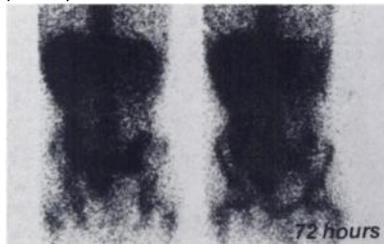
# The UNION CARBIDE Whole Body Imager . . . Faster Patient Throughput.

- Capable of performing more than 18 whole body scans per 8 hour day; maximum scan speed is 20cm/minute.
- Dual detector heads provide simultaneous anterior/posterior focal tomographic views with no patient repositioning.
- Parabolic focus collimators allow superior resolution at depth without sacrificing sensitivity.
- Thick NaI crystals (.86") and dual pulse height analyzers make the system ideal for Gallium imaging.
- Built-in floppy diskette stores raw data.
- Image enhancement controls and 2x magnification are standard.
- Organ mode allows high-resolution static organ studies, two views at a time.
- Priced below comparable gamma camera systems.

## Ask UNION CARBIDE for the facts.

Union Carbide Medical Products are designed to enhance diagnosis and research, produce a return on investment, and create better health care at lower patient costs. Send today for descriptive literature. Or call for fast action.

*Below - Organ mode Gallium scans of a 30 year old male 72 hours post-injection (posterior and anterior views) and 96 hours post-injection with 5 mCi of Ga-67. Abnormal activity in the lower abdomen is seen clearly with two photo peaks.*



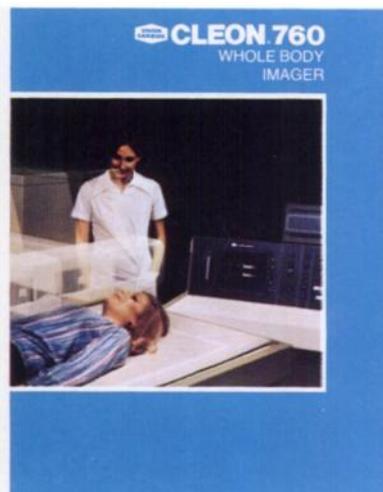
*Above - Actual 13.5 to 1 minification of posterior and anterior whole body bone scan of a 45 year old male two hours post-injection with 20 mCi Technetium Tc<sup>99m</sup> MDP. Diagnosis: normal.*

Look Into Life . . .



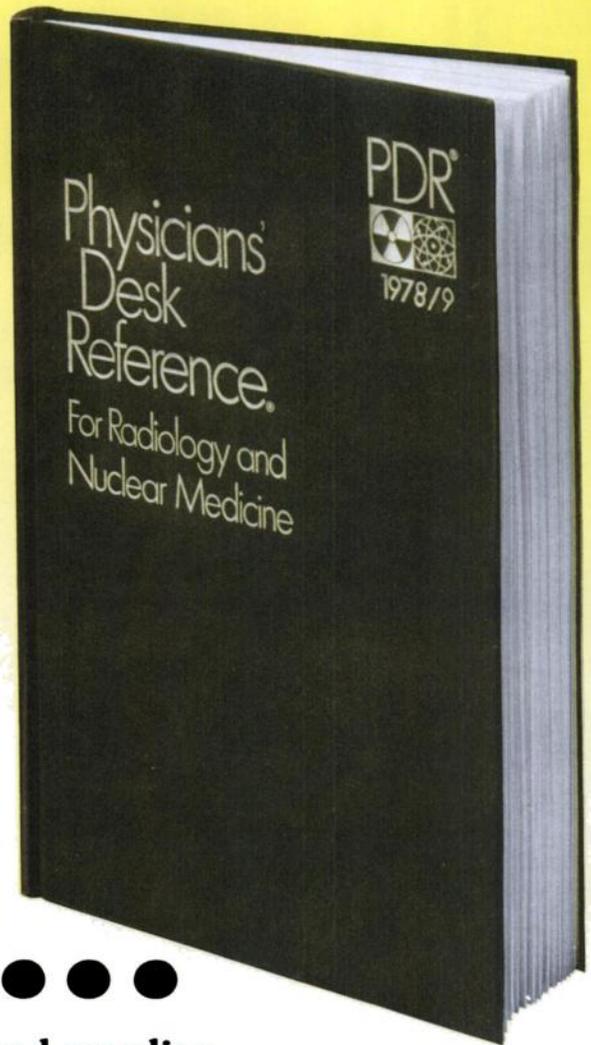
**Imaging Systems, Inc.  
Medical Products Division**

333 Providence Highway  
Norwood, Massachusetts 02062  
Within area 617, call 769-5400.  
Outside, call 1-800-225-9887.  
TELEX 924-494



**See us  
at the SNM  
in Atlanta,  
Booth N**

# The first place to look...



## **for professional products and supplies**

PDR® is the acknowledged ethical reference source for professional product information . . . it organizes package insert information on radiopharmaceuticals and commonly used general pharmaceuticals. It also includes manufacturers' information on test kits, radiographic film and dosimetry devices.

## **for sophisticated instruments and equipment**

Look into PDR for advanced diagnostic aids—ultrasound equipment, linear accelerators, computerized tomographic scanners—selections are organized by manufacturer to suit your needs and budget. A reply card information service is included for your convenience.

## **and more**

Books, monographs, reference volumes, audiovisual programs . . . PDR holds a library full of professional growth opportunity . . . and an easy-order card, to bring it to you.

Nuclear Medicine M.D.s, Radiologists, and Pathologists refer to PDR actively . . . consulting it more than 500,000 times a year for product information.

# PDR®

**PDR For Radiology and Nuclear Medicine  
your source for professional product selection.**

For further information, call Edward R. Barnhart,  
Business Manager, at 201-262-3030.

# If you're getting all these advantages from your TSH RIA Kit, you must be using ours



## Quick reliable results

Tests are completed in one working day — with excellent reproducibility within and between batches.

## Room Temperature Incubation

Eliminates the use of a water bath for the incubation stages.

## Colour coding reduces missed tubes

And indicates adequate mixing of reagents.

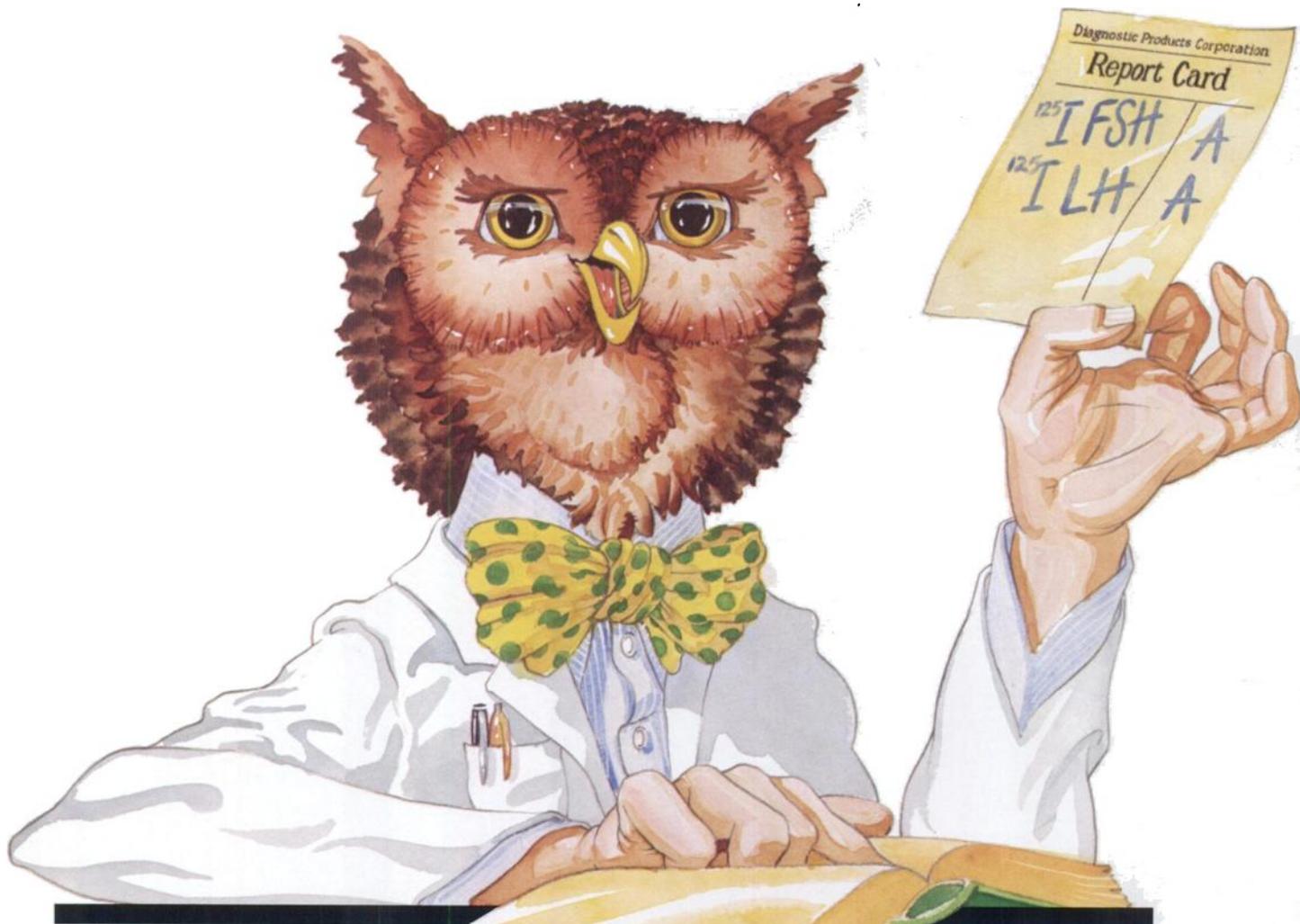
## New TSH RIA Kit

Examine the advantages of our new kit for yourself, and discover the optimum balance we have achieved in assay performance, reliability and service.



The  
Radiochemical  
Centre  
Amersham

# Now $^{125}\text{I}$ FSH and $^{125}\text{I}$ LH Kits from a Grade A Source.



Our reputation for high quality has put Diagnostic Products Corporation in a class by itself. And now we're introducing  $^{125}\text{I}$  FSH and  $^{125}\text{I}$  LH kits that offer the same accuracy and specificity that have gained us high marks in the radioimmunoassay test field.

Both kits offer a double antibody PEG separation technique and an overnight incubation. Individual calibrators are provided thereby eliminating the need for a dilution curve. All reagents are lyophilized for maximum stability and shipped at ambient

temperatures. Color coding of the reagents is provided for ease of operation.

The assay range for both tests is 2-100 mIU/ml. And the C.V. is just 3% within run and 7% run-to-run. Both kits are available in 100 or 200 tube/kits.

For a real education on what our kits can do to make your job easier, write:

## **Diagnostic Products Corporation**

12306 Exposition Blvd., Los Angeles, Ca. 90064. Call toll free (800) 421-7171 or collect in California (213) 826-0831. In Canada, call Intermedico collect (416) 444-0732.

# NOW PROGRAMMED FOR RADIOCHEMICAL PURITY ANALYSIS.

RADIOCHEMICAL PURITY ANALYSIS  
AND QC CHROMATOGRAPHIC RECORD

RADIOPHARMACEUTICAL: *Sulfur Colloid*

NUCLIDE: TECHNETIUM 99M

LOT NO. 45G-310 KIT NO. 14 NK-159

ABSORBENT: *Waters #1*

SOLVENT: *Normal Saline*

DATE: 30 JAN 78

SAMPLE NUMBER	RATIO*
19	0.900
18	0.014
17	0.018
16	0.019
15	0.049

\*MULTIPLY RATIO BY 100  
TO GET PERCENTAGE

**CHI** CAPINTEC, INC.  
136 SUMMIT AVENUE • MONTVALE, NEW JERSEY 07645 U.S.A.  
PHONE (201) 391-3930 TELEX 138630 (CAPINTEC MTLE)

**HISTOGRAM OF ACTIVITY DISTRIBUTION**

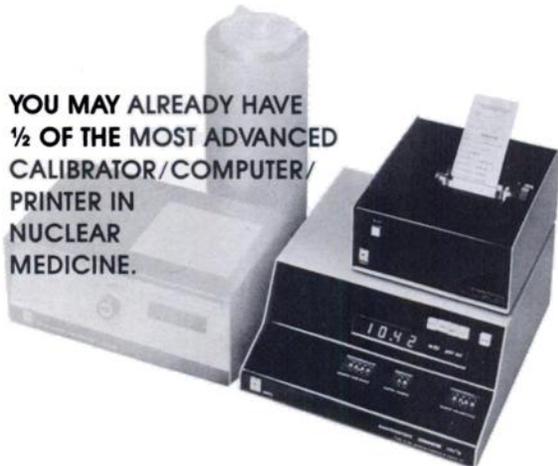
**Q.C. DATA**

The new Capintec CRC-U® computer/printer provides a quick and easy method of computing and recording the target to non-target ratio of imaging compounds as demonstrated by radiochromatographic separation of the imaging compound.

The CRC-U® works with your present Capintec calibrator to provide the most advanced calibrator/computer/printer system in nuclear medicine. Write or call for prices and ordering information.

Anticipating the purchase of a new calibrator? The Capintec Model 30 incorporates all of the features available with the CRC-U®.

YOU MAY ALREADY HAVE  
½ OF THE MOST ADVANCED  
CALIBRATOR/COMPUTER/  
PRINTER IN  
NUCLEAR  
MEDICINE.



# CAPINTEC, INC.

136 SUMMIT AVENUE • MONTVALE, NJ 07645 U.S.A. • (201) 391-3930 TELEX 138630 (CAPINTEC MTLE)  
4151 MIDDLEFIELD ROAD • PALO ALTO, CALIFORNIA 94306 • (415) 493-5011

# WAIT. All Xenon Gas Monitors are not created equal.

Before you invest in xenon monitoring equipment, discover the unique features of the new

## XenAlert™ XENON-133 MONITOR



## The ONLY wide-range unit that monitors ROOM AIR and GAS TRAP OUTPUT

- Reads directly in Maximum Permissible Concentration (MPC) units (or fractions thereof).
- Integrates and displays  $^{133}\text{Xe}$  concentration in MPC-Hours.\*
- Audio and visual indicators alert you BEFORE hazardous xenon concentrations are reached.

... AND MUCH MORE!

Details on request.  
Ask for  
Bulletin 266-B

*\*The Maximum Permissible Concentration of  $^{133}\text{Xe}$  in a restricted area is  $1 \times 10^{-5}$   $\mu\text{Ci/ml}$  for a time period of 40 hours in any 7 consecutive days.*

TM Nuclear Associates

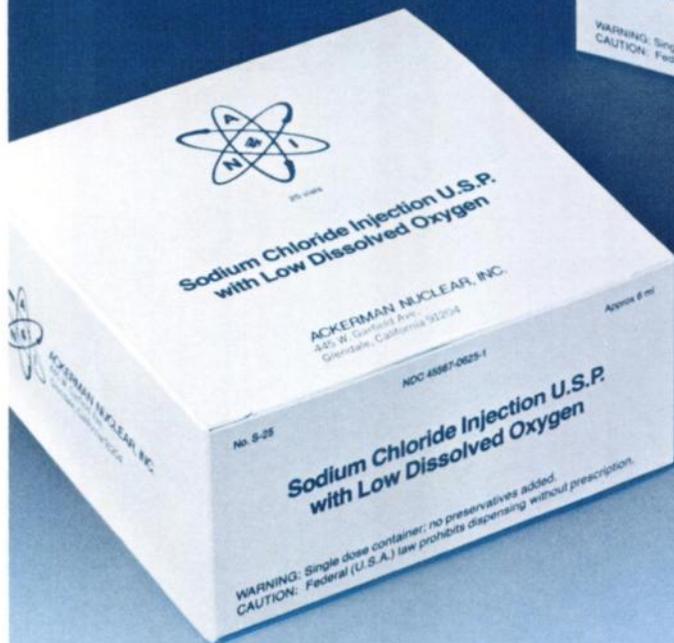


**NUCLEAR ASSOCIATES**  
Division of VICTOREEN, INC.

100 Voice Road • Carle Place, N.Y. 11514 • (516) 741-6360

# THE OBVIOUS SOLUTION

NOW AVAILABLE  
FOR ROUTINE USE

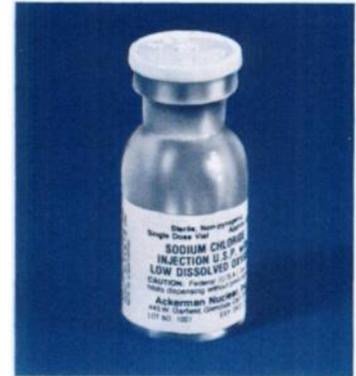


# THE OBVIOUS SOLUTION

## Low\* Dissolved Oxygen Non-preservative normal saline U.S.P

Designed with Nuclear Medicine in mind, Low Dissolved Oxygen, non-preservative, normal saline for routine use is now available from Ackerman Nuclear, Inc.

- **ELUTION:**  
Use for eluting Technetium-99m generators.
- **DILUTION:**  
Use for diluting high specific concentrations of Technetium-99m.



### SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN pH 4.5 to 7.0

#### DESCRIPTION:

SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN is a sterile isotonic solution of sodium chloride in water for injection. It contains no antimicrobial agent. It contains 0.9% sodium chloride and is packaged in single dose vials. The osmolarity is 300 mOsm/l, the dissolved oxygen content is less than 5 ppm.

#### INDICATIONS:

SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN is indicated for eluting, preparing and/or diluting pharmaceuticals that specify oxidants may cause adverse effects on the final product. SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN is also used as a fluid and electrolyte replenisher or as an irrigating solution.

#### WARNING:

Excessive amounts of sodium chloride by any route may cause hypopotassemia and acidosis. Excessive amounts by the parental route may precipitate congestive heart failure and acute pulmonary edema, especially in patients with cardiovascular disease, and in patients receiving corticosteroids or corticotropin drugs that may give rise to sodium retention. No antimicrobial agent has been added.

#### PRECAUTIONS:

Unused amounts should be discarded immediately following withdrawal of any portion of the contents.

#### HOW SUPPLIED:

Catalog No.	Product	Packaging
S-25	SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN	25/10 ml vials

Each 10 ml single dose vial contains approximately 6 ml. Each ml contains 9 mg sodium chloride providing 0.154 mEq each of sodium and chloride ions. Total osmolarity 300 mOsm/l; pH between 4.5 and 7.0. Dissolved oxygen content less than 5 ppm. Contains no preservatives.

**ACKERMAN NUCLEAR, INC.**  
445 W. Garfield Avenue  
Glendale, Calif. 91204

1/78

**Decrease the amount of oxygen you add daily and reduce the effect of one more variable from your radiopharmacy. Use Low Dissolved Oxygen saline when preparing kits containing any stannous tin products.**

\*less than 5 ppm

For additional information call or write to:



**ACKERMAN NUCLEAR, INC.**

Pharmaceuticals for Nuclear Medicine  
445 W. Garfield Ave.  
Glendale, CA 91204, USA  
(213) 240-8555

# TO MONITOR The Chemotherapy Of The Cancer Patient

**Diagnostic Biochemistry Inc.**

*Presents*

## **Doxorubicin [<sup>125</sup>I] (Adriamycin)\* Radioimmunoassay Kit**

For Investigational Use Only.

High circulating levels of Adriamycin\* may result in irreversible myocardial damage, bone marrow depression, and gastrointestinal trauma.<sup>1 2 3</sup> Knowledge of circulating Adriamycin\* concentrations therefore, is important.

Our <sup>125</sup>I Doxorubicin (Adriamycin) Radioimmunoassay Kit features a rapid, simple procedure with 100 picogram sensitivity in serum, plasma or urine. Six precalibrated standards as well as a control serum are supplied. The stable <sup>125</sup>I tracer and one hour incubation time makes this kit a unique tool in cancer management.

1. Bonadonna, G. et al: Phase I and preliminary Phase II evaluation of adriamycin (NSC 123127), *Cancer Res.* 30, 2572, 1970
2. Middleman, E. et al: Clinical trials with adriamycin. *Cancer*, 28, 844, 1971
3. Wang, J. et al: Therapeutic effect and toxicity of adriamycin in patients with neoplastic diseases. *Cancer*, 28, 837, 1971

\*Tradename Adria Labs.

## **Methotrexate [<sup>125</sup>I] Radioimmunoassay Kit**

High dose Methotrexate therapy in combination with leucovorin "rescue" treatment creates a vital need for close monitoring of circulating Methotrexate plasma levels. Methotrexate overdose has been shown to be associated with severe myelosuppression, renal damage<sup>1 2</sup> and hepatotoxicity.<sup>3</sup>

Our <sup>125</sup>I Methotrexate Radioimmunoassay Kit provides a rapid simple method, with sensitivity of 10 picograms in serum, plasma, cerebrospinal fluid or urine. Results can be reported in less than 1½ hours. Precalibrated human serum standards and control serum are provided as well as a stable <sup>125</sup>I tracer and anti-serum.

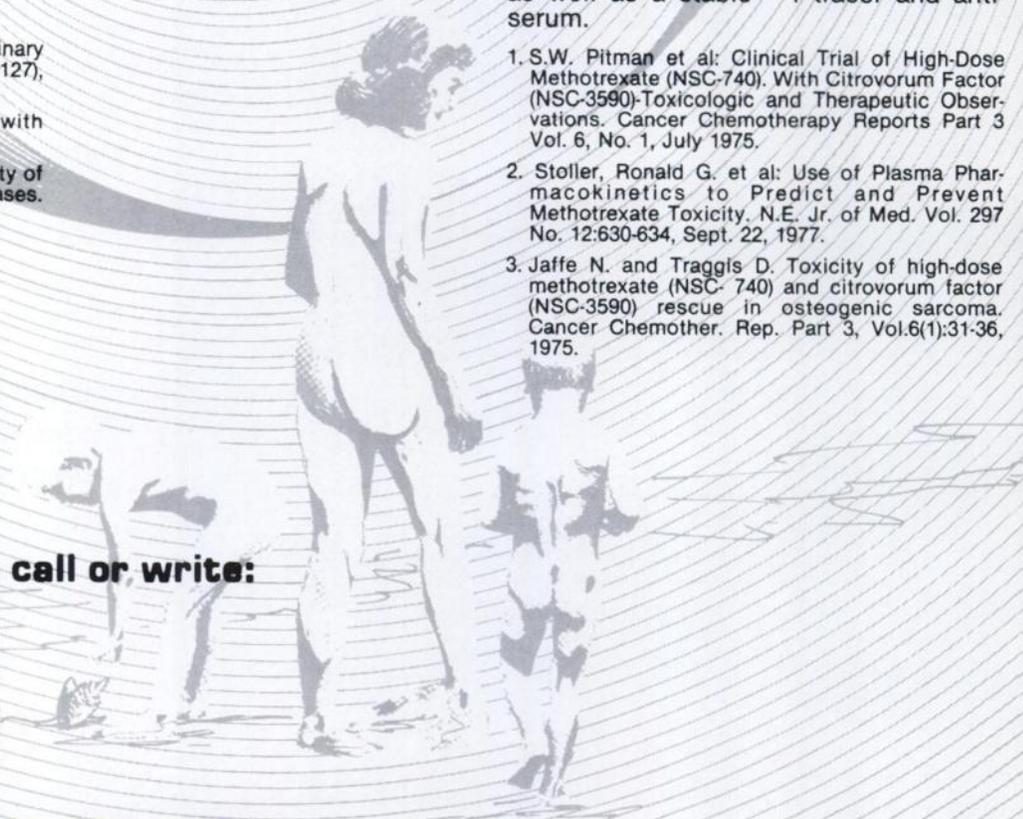
1. S.W. Pitman et al: Clinical Trial of High-Dose Methotrexate (NSC-740). With Citrovorum Factor (NSC-3590)-Toxicologic and Therapeutic Observations. *Cancer Chemotherapy Reports Part 3* Vol. 6, No. 1, July 1975.
2. Stoller, Ronald G. et al: Use of Plasma Pharmacokinetics to Predict and Prevent Methotrexate Toxicity. *N.E. Jr. of Med.* Vol. 297 No. 12:630-634, Sept. 22, 1977.
3. Jaffe N. and Traggis D. Toxicity of high-dose methotrexate (NSC-740) and citrovorum factor (NSC-3590) rescue in osteogenic sarcoma. *Cancer Chemother. Rep. Part 3, Vol.6(1):31-36, 1975.*

**For further information call or write:**

**Diagnostic  
Biochemistry  
Inc.**

**[714] 452-0950**

10457-H ROSELLE STREET • SAN DIEGO, CA 92121





## World-Wide Acceptance ... Global Availability



**ISOLAB** inc.  
INNOVATIVE  
PRODUCTS  
FOR RESEARCH  
Drawer 4350 Akron Ohio USA 44321

Phone: 216/825-4528 collect Or  
800/321-9632 toll-free  
Cables: ISOLAB AKRON  
Telex: 98-6475

# ISOCLEAN CONCENTRATE

## Radio-Labware Cleaner

The most effective solution anywhere offered for cleansing hot-lab apparatus of adherent radioactivity. Safe and easy-to-use. Proves itself thousands of times daily in research and clinical laboratories throughout the world.

Now available at reasonable cost, internationally, through licensed manufacture to Isolab's exacting specifications, plus national distribution from local stocks.

*Contact your nearest Isoclean licensee or distributor for complete information.*

**WESTERN EUROPE**  
BIOLAB S. A.  
Ave. Michel-Ange 8  
1040 Brussels, Belgium

**IBERIAN PENINSULA**  
ATOM  
Paseo del Monte, 34  
Barcelona-12, Spain

**SOUTH AFRICA**  
CHEMLAB Pty. Ltd.  
P.O. Box 56218  
Pinetown, Transvaal, RSA

**AUSTRALASIA**  
S.R.E. Pty. Ltd.  
P.O. Box 69  
Pennant Hills, N.S.W. 2120

*In the U.S. and Canada: Order from any office of Amersham-Searle, Nuclear Associates, Picker and other distributors—or call Isolab collect.*

# NOW AVAILABLE FOR USE WITH UP TO 90 mCi PER VIAL.



## Easy to prepare.<sup>1</sup>

**Stable formulation** prepared with stannous tartrate, which is more resistant to oxidation than stannous chloride.<sup>2</sup>

**Lowest dose rate** to the lungs of any commercially available kit.<sup>3</sup>

For ordering, customer service and technical information call toll-free: (800) 431-1146. In New York State, call (914) 351-2131, ext. 227.

**CintiChem**  
TECHNETIUM 99m

## Technetium Tc 99m Aggregated Albumin Kit **MAA** DIAGNOSTIC - FOR INTRAVENOUS USE

### BRIEF SUMMARY OF PRESCRIBING INFORMATION

#### Indications and usage

Technetium Tc 99m Aggregated Albumin is indicated as a lung imaging agent to be used as an adjunct in the evaluation of pulmonary perfusion.

#### contraindications

Technetium Tc 99m Aggregated Albumin should not be administered to patients with severe pulmonary hypertension.

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

#### warnings

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

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

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

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

#### precautions

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

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

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

The contents of the vial are sterile and pyrogen-free. It is essential that the user follows the directions carefully and adheres to strict aseptic procedures during preparation of the radiodiagnostic.

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

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

The contents of the vial are under a nitrogen atmosphere and should be protected from air. On preparation with Sodium Pertechnetate Tc 99m, the contents of the vial should be mixed by gentle swirling to avoid changes in particle size. Do not use if clumping or foaming of the contents is observed.

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

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

Safety and effectiveness in children have not been established.

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

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

#### adverse reactions

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

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

#### how supplied

##### kit contents

5 STERILE MULTIDOSE REACTION VIALS (10 cc, silver aluminum overseal), each containing 0.34 mg MAA Aggregated Normal Serum Albumin (Human)  $2.0 \times 10^8 \pm 25\%$  particles, 0.27 mg stannous tartrate, 0.6 ml of isotonic saline. Hydrochloric acid and/or sodium hydroxide may have been added for pH adjustment.

10 PRESSURE-SENSITIVE LABELS for final Technetium Tc 99m Aggregated Albumin preparation.

1 PACKAGE INSERT.

#### FOR FULL PREPARATION AND PRESCRIBING INFORMATION, SEE PACKAGE INSERT.

Notes: 1. See package insert for full preparation instructions. 2. Reg. U.S. Pat. Off. #3987157, Union Carbide Corporation, Oct. 19, 1976. 3. Refer to Union Carbide and competitive package inserts for full lung dosimetry information.

**UNION CARBIDE** FROM ATOM TO IMAGE

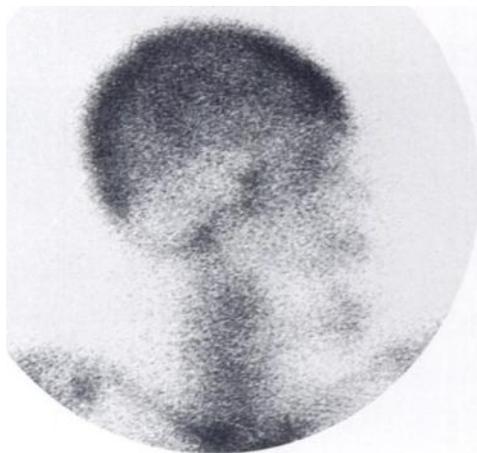
Union Carbide Corporation • Medical Products Division • Nuclear Products • P.O. Box 324 • Tuxedo, New York 10987  
CintiChem is a registered trademark of Union Carbide Corporation.

OSTEOLITE bone imaging in metabolic disease

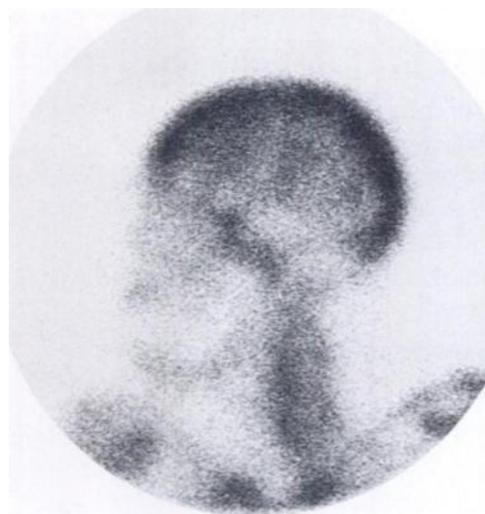
The superior  
technique:

“...the bone scan  
is a more sensitive  
indicator of  
abnormal metabolic  
activity than  
the X-ray...”<sup>1</sup>

1. *Sem Nucl Med* 6:1, 1976



RL



LL

The superior  
agent:

**OSTEOLITE™**

Technetium Tc 99m Medronate Sodium Kit (MDP)

**NEN** New England Nuclear®

# In metabolic bone disease... for evaluating extent and activity of skeletal involvement.

## Most rapid blood clearance<sup>2</sup>

- At 90 minutes postinjection, blood clearance of MDP pharmacologically identical to OSTEOLITE was approximately equal to that of tested pyrophosphate agents at 6 hours postinjection.
- At 3 hours, MDP blood levels were considerably less than those of tested EHDP and pyrophosphate.

**Result: low-background studies, whether you must scan early to meet patient-flow demands, or at 3 hours for more optimal image detail.**

## Lowest soft tissue activity<sup>2,3</sup>

The "difference in soft tissue activity (highest with polyphosphate and lowest with MDP) is discernible in clinical images."<sup>2</sup> A University of Minnesota study found that only 4% of 175 MDP images showed moderate to marked soft tissue activity, compared to 17% of EHDP images.<sup>3</sup>

**Result: highest assurance of visualizing all skeletal structures.**

## Highest target-to-background differential<sup>4</sup>

OSTEOLITE's rapid blood clearance and lower soft tissue uptake usually enable current gamma cameras to resolve peripheral skeletal structures and phalanges.

**Result: confidence of detecting resolution-challenging alterations in osteogenesis...even roentgenographically "invisible" fractures and small metastases.**

## Convenient storage and preparation

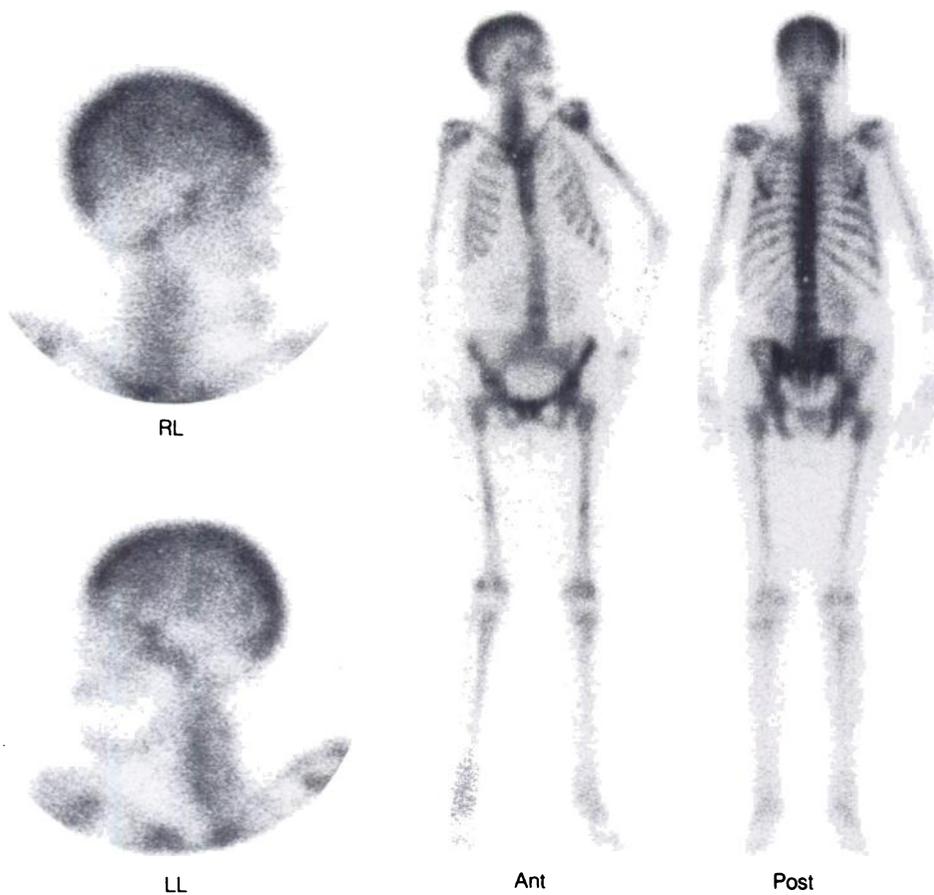
Available in 5-vial or 30-vial "Convenience Packs," OSTEOLITE can be stored and used at room temperature (15–30°C).

### REFERENCES:

1. Freeman LM, Blafox MD: Letter from the editors. *Sem Nucl Med* 6:1, 1976
2. Subramanian G et al: Technetium-99m-methylene diphosphonate — a superior agent for skeletal imaging: Comparison with other technetium complexes. *J Nucl Med* 16:744, 1975
3. Forstrom L et al: Data on file at New England Nuclear, Medical Diagnostics Division, North Billerica, MA
4. Davis MA, Jones AG: Comparison of <sup>99m</sup>Tc-labeled phosphate and phosphonate agents for skeletal imaging. *Sem Nucl Med* 6:19, 1976
5. Sy WM, Mittal AK: Bone scan in chronic dialysis patients with evidence of secondary hyperparathyroidism and renal osteodystrophy. *Br J Radiol* 48:878, 1975

# OSTEOLITE™

## Technetium Tc 99m Medronate Sodium Kit (MDP)



Images produced with 15 mCi technetium-99m-labeled OSTEOLITE; recorded at 500 K counts, Searle LFOV™ camera with Micro Dot™ Imager.

### Case report:

68-year-old female, hypercalcemic on routine examination, referred to "rule out metastatic disease." No known primary. OSTEOLITE images show increased calvarial uptake, poorly visualized kidneys, generally diffuse skeletal uptake. Findings interpreted as more consistent with hyperparathyroidism than metastatic disease. Nuclear medicine interpretation was confirmed by further laboratory study.

### Discussion:

The differential diagnosis of hypercalcemia is often difficult and only occasionally resolved by a clear history of vitamin D intoxication, sarcoidosis, or multiple myeloma. The incidental discovery of elevated serum calcium requires differentiation: is it malignant disease with osseous metastases; ectopic pseudohyperparathyroidism; benign, true hyperparathyroidism?

Osseous metastases can usually be detected or ruled out by routine skeletal imaging. Primary sites of osteitis associated with increased parathyroid hormone production include the skull, ends of the clavicles, and hands. Sy and Mittal have reported that bone scans in renal patients with secondary hyperparathyroidism typically show increased activity in the calvaria, mandible, acromioclavicular area, sternum, vertebrae, distal thirds of long bones, and the phalanges and metacarpals.<sup>5</sup>

Please see following page for full prescribing information.

**NEN** New England Nuclear®

# OSTEOLITE™

## Technetium Tc 99m Medronate Sodium Kit (Formerly Known as MDP)

October 1977

**DESCRIPTION:** New England Nuclear's OSTEOLITE™ Technetium Tc 99m Medronate Sodium Kit (formerly known as MDP), is supplied sterile and non-pyrogenic in lyophilized kit form suitable for reconstitution with sodium pertechnetate Tc 99m to form a diagnostic skeletal imaging agent for intravenous administration. Each vial contains 10mg medronate disodium and 0.85mg stannous chloride dihydrate; pH is adjusted to between 7.0–7.5 with hydrochloric acid and/or sodium hydroxide solution. The contents of the vial are lyophilized and stored under nitrogen.

### PHYSICAL CHARACTERISTICS

Technetium Tc 99m decays by isomeric transition with a physical half-life of 6.02 hours. (SOURCE: Martin, M. J. Nuclear Data Project, Oak Ridge National Laboratory, March, 1976.) Photons that are useful for imaging studies are listed in Table 1.

Table 1. Principal Radiation Emission Data—  
Technetium Tc 99m

Radiation	Mean %/ Disintegration	Mean Energy (keV)
Gamma-2	88.96	140.5

To facilitate correction for physical decay of Technetium Tc 99m, the fractions of initial activity that remain at selected intervals after the time of calibration are shown in Table 2.

Table 2. Physical Decay Chart:  
Technetium Tc 99m Half-Life 6.02 Hours

Hours	Fraction Remaining	Hours	Fraction Remaining
0*	1.000	8	.398
1	.891	9	.355
2	.794	10	.316
3	.708	11	.282
4	.631	12	.251
5	.562	18	.126
6	.501	24	.063
7	.447		

\*Calibration Time

### EXTERNAL RADIATION

The specific gamma ray constant for Technetium Tc 99m is 0.8R/mCi-hr. at 1cm. The half value layer is 0.2mm of Pb. To facilitate control of radiation exposure from millicurie amounts of Technetium Tc 99m, the use of a 6.35mm thick standard radiation elution lead shield will attenuate the radiation emitted by a factor greater than 10<sup>-4</sup>.

Table 3. Radiation Attenuation By Lead Shielding

Shield Thickness (Pb)mm	Coefficient of Attenuation
0.2	0.5
0.95	10 <sup>-1</sup>
1.8	10 <sup>-2</sup>
2.7	10 <sup>-3</sup>
3.6	10 <sup>-4</sup>
4.5	10 <sup>-5</sup>
5.4	10 <sup>-6</sup>
6.3	10 <sup>-7</sup>

**CLINICAL PHARMACOLOGY:** Upon intravenous injection, Technetium Tc 99m OSTEOLITE exhibits a specific affinity for areas of altered osteogenesis. In humans, blood levels fall to 4–10% of the injected dose by two hours post-injection and to 3–5% by three hours. During the first 24 hours following its administration in patients with normal renal function, 50–75% of the radioactivity is excreted into the urine and less than 2% of the injected dose remains in the vascular system.

Uptake of the Technetium Tc 99m in bone appears to be related to osteogenic activity and to skeletal blood perfusion. The deposition in the skeleton is bilaterally symmetrical, with increased accumulation in the axial structure as compared to the appendicular skeleton. There is increased activity in the distal aspect of long bones as compared to the diaphyses. In pediatric patients, in whom the epiphyseal centers are still open, there is more marked accumulation of the radiopharmaceutical in the distal aspects of long bones than is seen in adults in whom the epiphyseal centers are closed. Localized areas of abnormal accumulation of the radiopharmaceutical may be seen in primary skeletal malignancies, metastatic malignancies to bone, acute or chronic osteomyelitis, arthritides, recent fractures, areas of ectopic calcification, Paget's disease, regional migratory osteoporosis, areas of aseptic necrosis and, in general, any pathological situation involving bone in which there is increased osteogenic activity or localized increased osseous blood perfusion. Since increased osteogenic activity and localized increased osseous blood perfusion are not usually present in chronic bone diseases, bone imaging agents, in general, are not effective in detecting such diseases. Localized areas of decreased accumulation of the radiopharmaceutical may be noted in areas of bone which have received localized fields of external radiation or to which blood flow has been interrupted. OSTEOLITE has also been noted to accumulate in areas of acute myocardial infarction from one to fourteen days after the pathologic event.

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

**CONTRAINDICATIONS:** None known.

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

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

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

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

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

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

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m medronate

sodium should be used in pregnant women only when clearly needed.

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

Safety and effectiveness in children have not been established.

**ADVERSE REACTIONS:** None reported.

**DOSAGE AND ADMINISTRATION:** The recommended dose for the average 70kg adult patient is 15mCi with a range of 10–20mCi. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration. Optimal imaging results are obtained within one to four hours after administration.

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

The vial contains no bacteriostat.

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

### RADIATION DOSIMETRY

The estimated absorbed radiation dose to an average patient (70kg) from an intravenous injection of a maximum dose of 20 millicuries of Technetium Tc 99m OSTEOLITE is shown in Table 4.

Table 4. Absorbed Radiation Dose

Organ	Technetium Tc 99m Medronate Sodium (rads/20mCi)
Total Body	0.13
Bone Total	0.70
Red Marrow	0.56
Kidneys	0.62
Liver	0.16
Bladder Wall	2 hr void 4.8 hr void
Ovaries	2 hr void 4.8 hr void
Testes	2 hr void 4.8 hr void

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

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

Medronate Disodium—10mg  
Stannous Chloride Dihydrate—0.85mg

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

### INSTRUCTIONS FOR PREPARATION OF TECHNETIUM Tc 99m

OSTEOLITE: Aseptically inject 2 to 8ml of sodium pertechnetate Tc 99m (pertechnetate in isotonic saline without a bacteriostat) into the supplied vial of OSTEOLITE enclosed by a radiation shield. Swirl for at least ten seconds to dissolve completely. Label appropriately. Suitable labels have been supplied with each OSTEOLITE Kit. Use within six hours after reconstitution. For optimum results, this time should be minimized.

Using proper shielding, the vial containing the reconstituted solution should be visually inspected to insure that it is clear and free of particulate matter.

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

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

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



**New England Nuclear  
Medical Diagnostics Division**

601 Treble Cove Rd., North Billerica, MA 01862  
Call toll-free: 800-225-1572 Telex: 94-0996

(In Massachusetts and International: 617-482-9595)

Canada: NEN Canada, 2453 46th Avenue, Lachine, Que. H8T 3C9  
Tel: 514-636-4971

Europe: NEN Chemicals GmbH, D-6072 Dreieich, W. Germany,  
Postfach 401240 Tel: (06103) 85034 Order Entry: (06103) 81013

# the DELIVERERS

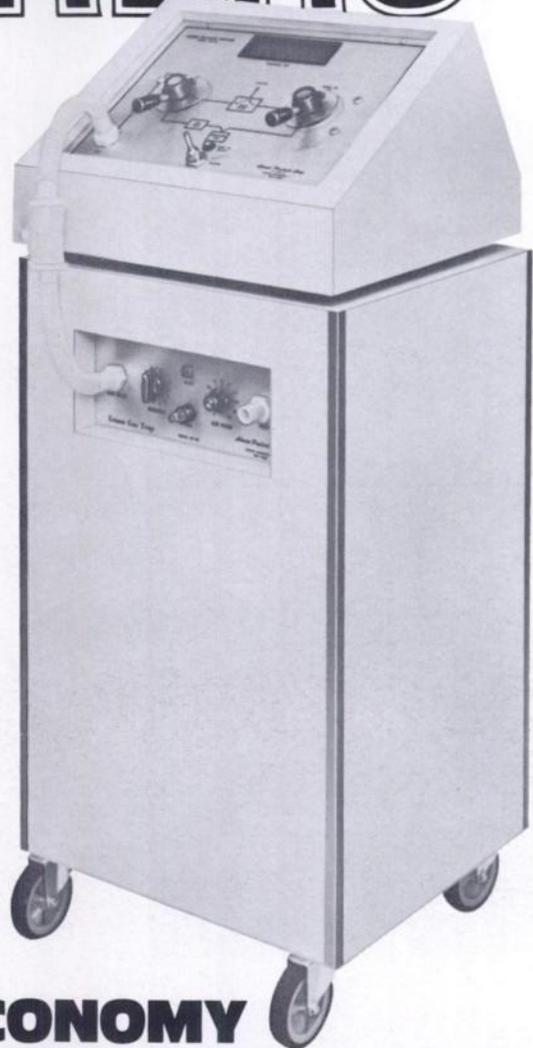


Automatic  
**PULMONEX**  
**XENON DELIVERY SYSTEM**

Single unit with integrated gas trap.

One 3-position control handle directs all functions through regional ventilation studies. Automatic venting of gas into the trap after each study. Air circulator assists patient breathing.

#130-500 Pulmonex  
Delivery System Only \$2495.



**ECONOMY**  
**XENON DELIVERY SYSTEM**

Modular two-section system.  
Delivery unit connects to gas trap.

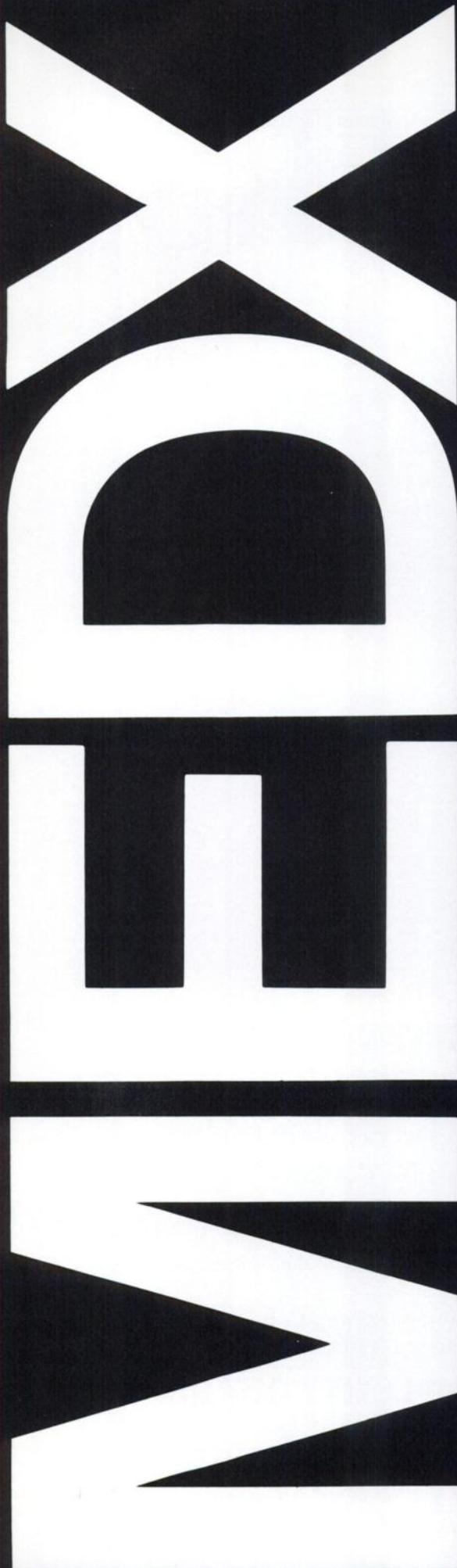
Delivery module is mounted over gas trap.  
Two handle control system channels gas and air through each phase of all regional ventilation studies.

#130-330 Xenon Delivery Unit  
#127-313 Xenon Gas Trap Only \$1890.

**THE DELIVERERS TAKE ALL THE COMPLEXITY OUT OF  
XENON STUDIES FROM START TO FINISH**

**Atomic Products Corporation**

Center Moriches, New York 11934, U.S.A. (516) 878-1074  
Visit us at booth #241 in Atlanta, at the SNM show



**The major  
medical centers  
are seeing  
the difference  
a Medx X-37  
Upgrade  
can make.**

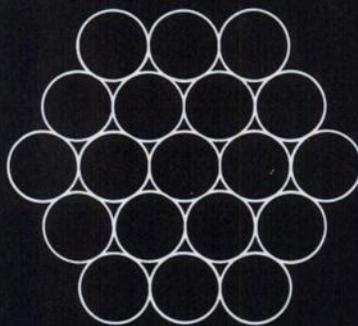
**Better pictures at low cost.**

Medx can convert your existing 19 tube gamma camera to a modern 37 tube high resolution system for only \$22,900.

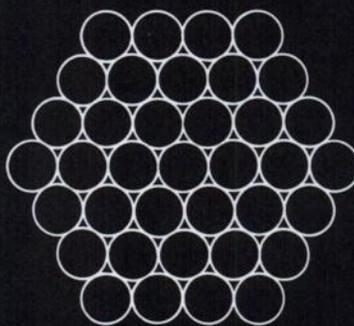
Medx Update X-37 is a simple, practical way to modernize your existing Pho/Gamma III<sup>®</sup> or Pho/Gamma HP<sup>®</sup> system. It provides you with a fully upgraded 37 tube system that guarantees you 1/8 inch intrinsic bar pattern resolution for 99m<sub>Tc</sub>.

For more information call  
(312) 991-0660.

Your present 19-phototube  
gamma camera has only 3/16" to  
1/4" resolution.



We can convert it to 37 photo-  
tubes with a high 1/8" resolution.



\* Registered trademark Searle Radiographics.

**Walter Reed Army Medical Center**  
Washington, D.C.

**University of Maryland**  
Baltimore, Maryland

**University of Utah**  
Salt Lake City, Utah

**Veteran's Administration Hospital**  
North Chicago, Illinois

**Johns Hopkins Hospital**  
Baltimore, Maryland

**University of Connecticut  
Health Center**  
Farmington, Connecticut

**Durham County General Hospital**  
Durham, North Carolina

**Research Medical Center**  
Kansas City, Missouri

**Bon Secours Hospital**  
Methuen, Massachusetts

**Brookhaven National Laboratory**  
Upton, New York

**St. Joseph Hospital**  
Albuquerque, New Mexico

**St. Joseph's Hospital**  
Bangor, Maine

**St. Joseph Mercy Hospital**  
Ann Arbor, Michigan

**St. Barnabas Hospital**  
Bronx, New York

**Radiology Service of El Paso**  
El Paso, Texas

**Polyclinic Hospital**  
Harrisburg, Pennsylvania

**Prince George's Hospital**  
Cheverly, Maryland

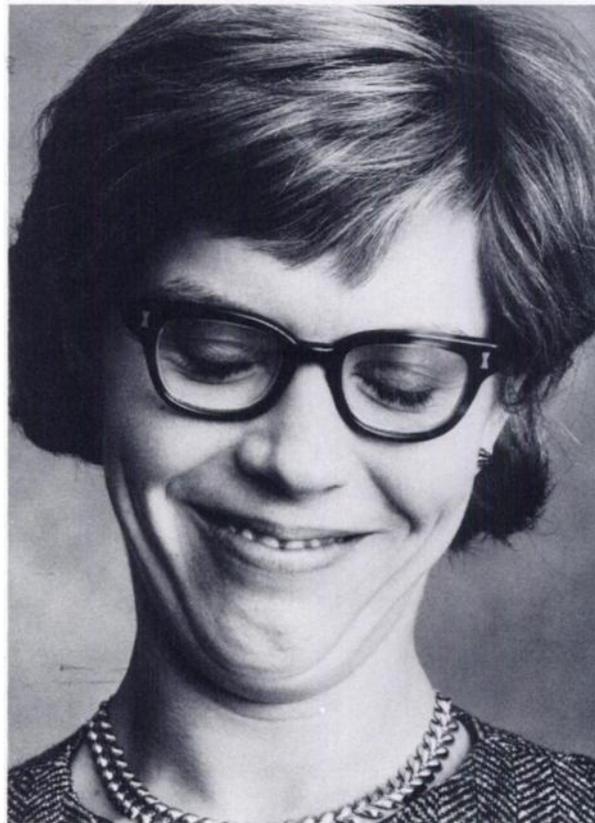
**Mt. Sinai Medical Center**  
Miami Beach, Florida

**NYU Medical Center**  
New York, New York

**Jewish Hospital**  
St. Louis, Missouri

# FOR GREATER SPEED AND ACCURACY, YOUR FILM BADGE IS COMPUTER CHECKED.

## THEN, THE COMPUTER IS MADGE FOSSI CHECKED.



If you think computers are infallible, you should know Madge Fossi. Her task is to catch that rare error — to the benefit of everyone who wears a Nuclibadge II radiation dosimeter.

Madge marvels at the computer's speed and accuracy, but that never stops her from checking and rechecking its work before personnel radiation exposure reports are sent to hospitals and other facilities using Nuclibadge II Radiation Monitoring Service.

Madge and the Searle computer are part of the team that evaluates exposed film and TLD chips, and issues the reports so essential to the long-term protection of hospital and research personnel working in radiation-risk areas. The computer-generated report details radiation exposures by individual. The report is so complete it meets federal, state, and

local requirements, and it is so reliable it meets Madge Fossi's own demanding criteria.

Where an exposure exceeds levels established by each client, Madge sees that it is reported immediately by phone. That's where personal attention really pays off.

Another way it pays is in fast response to your questions or request for changes. Our toll-free hotline is available for that purpose, and badges for new employees are on the way to you within 24 hours.

All aspects of the Searle personalized service are just as timely. Emergency reports and additional monitors are airmailed within 24 hours; exposure reports are returned within days of receipt of exposed packet and new packets are sent in plenty of time for distribution before the next monitoring period.

Our color coding system lets you know at a glance that a person is wearing the correct badge, and we have just the right Nuclibadge II monitoring badge for every situation—whole-body, wrist, ring, or wallet card.

Put Madge Fossi, the computer, and the rest of the Searle team to work for your hospital. Call toll-free today about a customized radiation monitoring program, and learn more about Searle's personal touch.

### **SEARLE**

**Searle Health Physics Services**

Unit of Searle Medical Products

2000 Nuclear Drive

Des Plaines, IL 60018

**call toll-free  
800/323-6015**

(In Illinois, call collect, 312/635-3387)

# GRUNE & STRATTON Titles on Display at Booth #160

## Recent Advances in Nuclear Medicine

### VOLUME V

Edited by JOHN H. LAWRENCE, M.D.  
and THOMAS BUDINGER, M.D., PH.D.

Volume 5 provides a state-of-the-art overview in the fields of nuclear medicine imaging using positrons, radiography using heavy ions, and radiotherapy using neutrons or heavy ions. In each of these areas both the earliest historical facets and the most recent data are presented in a highly accessible style. Featured are a summary of comparison of positron annihilation gamma imaging instruments encompassing the current emphasis on emission computed tomography with positron emitters; a presentation of all the important positron emitting radiopharmaceuticals, along with information on their production and uses; a discussion of the use of heavy ions for radiotherapy of humans including first results of breast radiography *in vivo* using heavy ions from the Bevelac; a review of neutrons for therapy of human tumors including an analysis of results from three national studies; a discussion of the use of heavy ions for therapy including rationale, results from previous work, and the most recent work on treatment of tumors with helium ions.

1978, 160 pp., \$24.50 ISBN: 0-8089-1068-X

## Principles of Cardiovascular Nuclear Medicine

Edited by B. LEONARD HOLMAN, EDMUND H.  
SONNENBLICK, M.D. and MICHAEL LESCH, M.D.

**CONTENTS:** Radioindicators for the Study of the Heart; Physics and Instrumentation; Blood Flow Measurements With Radio-nuclide-labelled Particles; Myocardial Imaging With Radioactive Potassium and Its Analogs; Myocardial Blood Flow in Coronary Artery Disease; Radionuclide Detection, Localization, and Quantitation of Intracardiac Shunts Between the Great Arteries; Physiology and Theory of Tracer Washout Techniques for the Estimation of Myocardial Blood Flow; Evaluation of Myocardial Metabolism and Perfusion With Positron-emitting Radionuclides; Gated Cardiac Blood-Pool Scan; Myocardial Scintigraphy by Infarct-avid Radiotracers; Left Ventricular Ejection Fraction. A "Progress in Cardiovascular Diseases" Reprint.

1978, 256 pp., \$19.50 ISBN: 0-8089-1082-5

## Therapy in Nuclear Medicine

Edited by RICHARD P. SPENCER, M.D., PH.D.

This truly unique volume fills a widely felt need—it brings together aspects of the rapidly growing use of parenterally administered radioactive materials in nuclear medicine therapy. The publication of this basic work signifies the increasing importance of radionuclides in therapy of malignant and benign diseases. The contributors review past accomplishments in the field, current progress, and potential areas for research. The volume is the result of a national symposium held in Hartford, Connecticut in March 1977.

**SECTION HEADINGS:** Background. Thyroid. Uses in Non-malignant Diseases. Systemic Therapy. "Limited Access" Use of Radionuclides.

1978, 416 pp., 127 illus., \$34.50 ISBN: 0-8089-1070-1

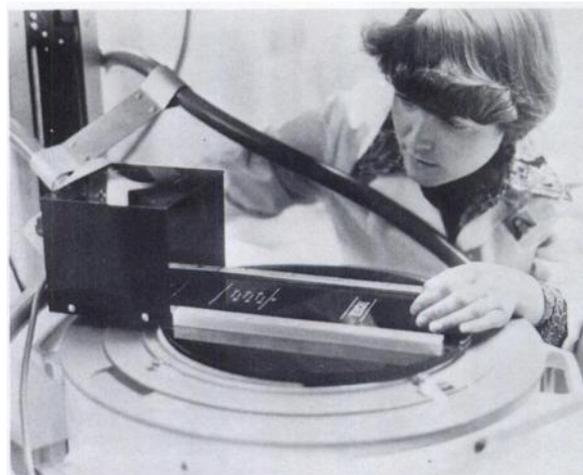
Send payment with order and save postage  
and handling charge.

Prices are subject to change without notice.

## GRUNE & STRATTON

A Subsidiary of Harcourt Brace Jovanovich, Publishers  
111 FIFTH AVENUE, NEW YORK, N.Y. 10003  
24-28 OVAL ROAD, LONDON NW1 7DX

Visit us at Booth #160 in Atlanta, at the SNM show



## VENTRICLE SIMULATOR CONFIRMS TEST RESULTS 14-day FREE trial!

Phone or write on your  
professional letterhead:  
O'NEILL INC.  
221 FELCH STREET,  
ANN ARBOR, MI, 48103  
AREA 313/973-2335

**O'NEILL**  
SPECIALISTS IN  
NUCLEAR  
MEDICINE

Visit us at booths #670, 672 in Atlanta, at the SNM show

### NUCLEAR MEDICINE MANAGER

Jackson Memorial Hospital, a 1250-bed major teaching hospital has a challenging opportunity available for an experienced Nuclear Medicine Technologist to assume management duties in the areas of nuclear medicine, radioassay and echocardiography. Individual will be responsible for technical and administrative functions; including developing and monitoring budgets, overall performance of nuclear medicine and ultrasound training programs, quality assurance, and supervision of personnel. Applicant should have proven technical expertise with at least 2 years experience at a chief technologist level. Must be ARRT registered. Salary commensurate with experience. Send complete resume in confidence to Vivian Lopez, or call collect (305) 325-6581.

**JACKSON MEMORIAL  
HOSPITAL**  
1611 N.W. 12th Avenue  
Miami, Florida 33136

An Equal Opportunity Employer. M/F

# Choose from a library of training materials:

**Audiovisual aids:**

**COMPUTER METHODS IN NUCLEAR MEDICINE:** A general orientation to the use of computer systems in display and processing of Nuclear Medicine images.

- Videotape ..... \$99.00
- 35mm cassette ..... \$74.00

**COMPUTER METHODS IN NUCLEAR CARDIOLOGY:** An introduction to computer techniques for first pass, multiple gated, thallium, ejection fractions, and ventricular wall motion display.

- Videotape ..... \$99.00
- 35mm cassette ..... \$74.00

**COMPUTER METHODS IN RADIOIMMUNOASSAY:** A general discussion of the application of a computerized data base to processing and presentation of RIA studies in the Nuclear Medicine department.

- 35mm cassette ..... \$74.00

**GRADED REST/STRESS RADIONUCLIDE VENTRICULOGRAPHY:** A videotape presentation of the general protocol for graded rest stress procedures. Includes protocol booklet and interpretations of clinical results.

- Videotape ..... \$65.00

**Textbooks:**

**COMPUTER METHODS: The Fundamentals of Digital Nuclear Medicine.** The first basic textbook on the use of computers for Nuclear image processing. Includes discussion of computers, hardware, software, clinical applications, Nuclear Cardiology, and suggestions for computer purchase.

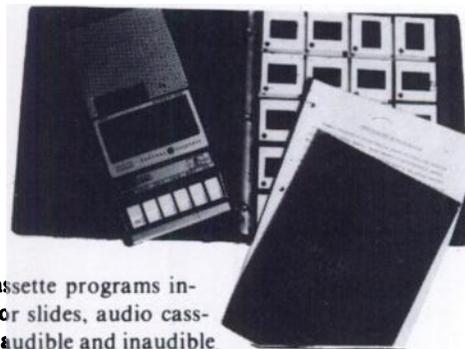
- Textbook ..... \$19.95

**COMPUTER METHODS: The Fundamentals of Nuclear Cardiology.** A recent update to the COMPUTER METHODS textbook concentrating on the application of computers to Nuclear Cardiology techniques. Includes theory of acquisition, First Pass, thallium, Multiple Gated, Rest Stress, edge detection, and ejection fraction calculation.

- Text Supplement ..... \$12.95  
(To be released June, 1979)



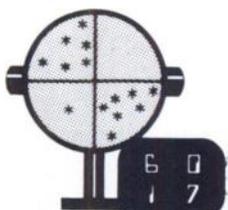
All videotape programs available in 3/4 inch UMATIC, 1/2 inch Betamax, or 1/2 inch VHS.



35mm/cassette programs include color slides, audio cassette with audible and inaudible tones for slide advance, and transcript. Includes attractive notebook with slide and cassette holders.



The **COMPUTER METHODS** textbooks are ideal additions to any training program.



## COMPUTER METHODS SUPPLEMENTS

P.O.B. 7398 • ANN ARBOR, MI 48107  
(313) 668-8665

NAME: \_\_\_\_\_  
 INSTITUTION: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_  
 TELEPHONE: \_\_\_\_\_  
 P.O. NUMBER: \_\_\_\_\_

- COMPUTER METHODS in Nuclear Medicine:**
- Videotape ..... \$99.00
  - 35mm/cassette ..... \$74.00
- COMPUTER METHODS in Nuclear Cardiology:**
- Videotape ..... \$99.00
  - 35mm/cassette ..... \$74.00
- COMPUTER METHODS in Radioimmunoassay:**
- 35mm/cassette ..... \$74.00
- GRADED REST/STRESS RADIONUCLIDE VENTRICULOGRAPHY:**
- Videotape ..... \$65.00

Videotape format: \_\_\_\_\_

- COMPUTER METHODS: The Fundamentals of Digital Nuclear Medicine:**
- Textbook ..... \$19.95
- COMPUTER METHODS: The Fundamentals of Nuclear Cardiology:**
- Text Supplement ..... \$12.95

# PLACEMENT

## POSITIONS OPEN

**PATHOLOGY-NUCLEAR MEDICINE**  
Physician being sought to join practice in a 400 bed community hospital. Send resume to William M. Bridger, M.D.: Baptist Medical Center, 2105 East South Blvd.: Montgomery, Alabama 36116.

**NUCLEAR MEDICINE RESIDENCY:**  
Two year program in Nuclear Medicine with two positions available. Requirement for admission is completion of prep post-doctoral training as outlined by the American Board of Nuclear Medicine. Positions offered are in a 600 bed general hospital, with over 7,000 scans and 11,000 in-vitro studies yearly. This program is dedicated to the clinical aspect of Nuclear Medicine, with research projects of a clinical nature. Two full-time Nuclear Medicine physicians direct the training, with the assistance of associated physicians, a radiation physicist and a radiopharmacist. Equipment includes six modern gamma cameras and large modern computing facility. Contact: D. R. Spiegelhoff, M.D., Director of Nuclear Medicine, St. Luke's Hospital, 2900 W. Oklahoma Avenue, Milwaukee, WI 53215.

**ASSISTANT CHIEF, NUCLEAR MEDICINE SERVICE.** The Minneapolis Veterans Administration Medical Center seeks candidate for the position of Assistant Chief, Nuclear Medicine Service effective July 1, 1979. Requirements include certification by the ABNM, a strong patient orientation and expertise in all phases of clinical medicine, including imaging, radioassay and internal radionuclide therapy. In addition, the Assistant Chief, Nuclear Medicine Service will have specific responsibilities in research and education. Applications from all qualified candidates are welcome. Inquiries, including a curriculum vitae and an autobiographical letter, should be sent to: Rex B. Shafer, M.D., Chief, Nuclear Medicine Service (115), Veterans Administration Medical Center, 54th Street and 48th Avenue South, Minneapolis, MN 55417. An Equal Opportunity Employer.

**CHIEF, NUCLEAR MEDICINE SERVICE.** Modern 550 bed Veterans Administration teaching hospital closely affiliated with Emory University School of Medicine. Academic interest important with appropriate faculty appointment to be made. Well-equipped and staffed department, excellent suburban location. Opportunity to expand and develop new programs. Position available immediately; Reply with C.V. and three references to: Chairman, Search Committee c/o Radiology Service, V.A. Medical Center (Atlanta), 1670 Clairmont Road, Decatur, Georgia 30033.

**POSTDOCTORAL FELLOW TO WORK** in area of 3-dimensional nuclear medicine imaging and instrumentation with special emphasis on cardiac applications. Must be citizen, non-citizen national, or admitted for permanent U.S. residency. Position open immediately. Send resume and phone numbers of 3 references to Dr. W. L. Rogers, Division of Nuclear Medicine, University of Michigan Medical Center, Ann Arbor, Michigan 48109. A nondiscriminatory/Affirmative action employer.

**RADIOLOGISTS — 400 BED MAJOR** medical center in South Florida seeking Board certified Diagnostic Radiologist with a subspecialty. Also, seeking a second Radiologist with specialization in ultrasound. Must have Florida license. Position opening September, 1979. Send C.V., photograph, current salary and minimum starting salary desired. Write Chairman, Board of Directors, Florida Medical Center, 5000 West Oakland Park Boulevard, Ft. Lauderdale, Florida 33313.

**NUCLEAR MEDICINE TECHNICIAN,** Registered or Registry Eligible. Progressive 401-bed teaching hospital is seeking qualified applicants for immediate openings in its Nuclear Medicine Laboratory. Imaging and radio-immunoassay. Competitive salary and excellent fringe benefits. Please direct reply to: Personnel Department, Flint Osteopathic Hospital, 3921 Beecher Road, Flint, Mich. 48502. Telephone (313) 762-4740.

**CERTIFIED NUCLEAR MEDICINE** Technician needed for busy Cardiology Department to work with Multi-Crystal Gamma Camera, to help in the development and organization of a Department of Nuclear Cardiology. Possible opportunities in Clinical Research and Teaching. Address all inquiries to E. Enrique Leguizamon, M.D., 1717 Shaffer Street, Suite 106, Kalamazoo, Michigan, 49001.

**POSITION AVAILABLE FOR INDIVIDUAL** with background in physics and nuclear medicine. Preference given to those with Masters Degree or more and two years experience. Duties include laboratory administration, coordination of technological staff, computer operations, and instrument quality control. Contact: Stanley M. Levenson, M.D., Assistant Director, Division of Nuclear Medicine, Georgetown University Hospital, 3800 Reservoir Rd. NW, Washington, D.C. 20007. Phone: (201) 625-2056.

**A TWO YEAR TRAINING PROGRAM IN** nuclear medicine leading to certification by the American Board of Nuclear Medicine or one year training program leading to certification in nuclear radiology by the American Board of Radiology is offered in an AMA approved integrated program offered by Vanderbilt University Hospital and the Veterans' Administration Hospital in Nashville, Tennessee. Five full-time board certified nuclear medicine physicians and eight full-time nuclear medicine Ph.D.'s participate in the didactic as well as clinical experience in the program. Equipment includes three large field scintillation cameras, three small field scintillation cameras, the PhoCon tomographic scanner, a solid state scanning tomographic camera, a proportional wire chamber, a fluorescent scanner, a portable camera and five computer systems. The clinical experience includes a complete spectrum of all imaging procedures for adults as well as the pediatric population. Particular emphasis is placed on nuclear cardiology, renal evaluation, pulmonary function studies and tumor evaluation. The program includes rotations through CT and ultrasound and has heavy emphasis on correlation between these two modalities and nuclear medicine procedures. A complete experience in a large radio-immunoassay laboratory and radiopharmacy is included. Requests for further information should be directed to F. David Rollo, M.D., Ph.D., Director, Division of Nuclear Medicine, Department of Radiology and Radiological Sciences, Vanderbilt University Hospital, Nashville, Tennessee 37232.

**CONFIDENTIAL SERVICE NATIONWIDE.** We are a search firm dealing nationwide in the Health Care Industry. All fees paid by employer. Forward resume with salary requirements and location preferences to BMI, Health Care Division, P.O. Box 6457, Columbia, S.C. 29260, (803) 787-8710.

**NUCLEAR MEDICINE PHYSICIAN.** A nuclear medicine physician is being sought to join two full time physicians in this active department in a 540 bed community hospital. Experience in nuclear cardiology is desired. Inquiries and curriculum vitae should be addressed to: John B. Richards, M.D., Department of Nuclear Medicine, Saint John's Hospital and Health Center, 1328 22nd Street, Santa Monica, CA 90404.

**NUCLEAR MEDICINE/NUCLEAR RADIOLOGY** Residencies: Available July 1, 1979. Approved two-year program in nuclear medicine, approved one-year program in nuclear radiology. Affiliated university/VA hospitals, 300 beds each. Active clinical program with ample opportunities for research and career development. Delightful high desert community. An equal opportunity, affirmative action, Title IX, Section 504 employer. Contact: Dennis D. Patton, M.D., Director, Division of Nuclear Medicine, Arizona Health Sciences Center, The University of Arizona, Tucson, AZ 85724.

**NUCLEAR MEDICINE PHYSICIAN TO** join ABNM certified physician at 700+ bed community hospital on Florida West Coast. Over 6000 imaging procedures per year. Nuclear Cardiology with Ohio Nuclear LFOV, Searle Pho Gamma IV, and DEC GAMMA II. Contact Ben I. Friedman, M.D., Morton F. Plant Hospital, Box 210, Clearwater, Florida 33517. (813) 441-5248 or evenings (813) 461-3857.

**NUCLEAR MEDICINE PHYSICIAN—**North Shore University Hospital, a teaching hospital of Cornell University Medical College, is looking for a nuclear medicine physician, who is board-certified or eligible, and has several years of experience. The individual will fill a staff position in the nuclear medicine division of the hospital, and will be eligible for an academic appointment at Cornell University Medical College. Prior training in radiology or internal medicine is acceptable. Appointees are required to assume clinical teaching and research responsibilities. Position is available July 1, 1979 or sooner. Address inquiries to Donald Margouloff, MD, Chief, Nuclear Medicine Division, Department of Medicine, North Shore University Hospital, 300 Community Drive, Manhasset, N.Y. 11030. (516) 562-4400. An equal opportunity employer.

**NUCLEAR MEDICINE TECHNOLOGIST.** Immediate openings in expanding 167 bed hospital for experienced tech or recent grad registry eligible. Salary commensurate with experience. Excellent benefits package. Submit resume to: Personnel Director, Box 340, Cookeville, Tennessee 38501, or call Allison (collect) (615) 528-2541. An equal opportunity employer.

**AMA-APPROVED NUCLEAR MEDICINE** residency position available July 1, 1979 at San Francisco General Hospital Medical Center. Contact: Myron Pollycove, M.D.; Chief, Nuclear Medicine; Director, Clinical Laboratory; S.F. Gen'l. Hosp. Med. Ctr.; Bldg. 100; San Francisco, CA 94110. Telephone (415) 648-0898.

**NUCLEAR MEDICINE TECHNOLOGIST, ASCP—**Position available immediately in new, modern hospital, new Nuclear Medicine Dept. Excellent employee benefits and salary. For information contact Jay Underwood, Personnel Director, Northwest Kansas Medical Center, P.O. Box 629, Goodland, Kansas 67735; (913) 899-3625.

**NUCLEAR MEDICINE, UNIVERSITY OF** Washington, Seattle, Washington: Considering candidates to enter residency in July 1980 and 1981, leading to NM Board eligibility. Comprehensive basic science and clinical experience. In Vitro, Metabolic, Imaging, Therapy, Cardiology, CAT, and Ultrasound. Large patient referral, excellent facilities. Research opportunities. For details contact: Wil B. Nelp, M.D., Director, Division of Nuclear Medicine, University Hospital, RC-70, Seattle, Washington 98195. Phone: (206) 543-3576. The University of Washington is an affirmative action, equal opportunity employer.

**PHYSICIAN—NUCLEAR RADIOLOGIST.** Applications are invited for a full-time post in the Department of Radiology from suitably qualified medical specialists, whose qualifications are registerable with the Medical Board of South Australia. The Department is equipped with excellent modern equipment for General Radiology, Complex Radiology, Ultrasound and Whole Body Computerized Tomography. The Nuclear Medicine section contains two L.F.O.V. cameras (Searle) with a whole body imaging attachment and M.D.S. Bicom computer system. Applicants should have a special interest in Radionuclide studies while experience in other imaging fields is desirable. Undergraduate and postgraduate teaching opportunities are considerable and research facilities are available. Appropriate academic status is awarded by the Flinders University of South Australia. Further information is available from Dr. G.T. Benness, Professor of Radiology. Special conditions: 37½ hours per week, rostered over seven (7) days. Out of hours duty as required, allowance for which has been included in the salary. Limited rights of private practice within the Medical Centre where appropriate. Salary: \$25,775/\$32,865 per annum depending upon relevant experience since gaining specialist qualification. Applications, including curriculum vitae and the names of three (3) referees should be addressed to: The Administrator, Flinders Medical Centre, BEDFORD PARK, S.A. 5042. Telephone 275-9911—Extension 4064.

**NUCLEAR MEDICINE TECHNOLOGIST.** Full time position available in a modern laboratory in a 217-bed hospital. MT(ASCP) or equivalent with experience in radioimmunoassay procedures. Certification as nuclear medicine technologist desirable. Very attractive sea coastal community. Excellent salary and benefits. Please respond to: Employee Relations Department, Newport Hospital, Friendship Street, Newport, R.I. 02840.

**NUCLEAR MEDICINE TECHNOLOGISTS.** The Greenville Hospital, a progressive 200-bed JCAH approved Hospital, is seeking full time Nuclear Medicine Technologists to join our staff of six registered Nuclear Medicine Technologists. The expanding department serves as an area referral center using two gamma cameras, adac computer and Dual Probe Magna Scanner for a large volume of inpatient and outpatient services. The current \$10.1 million building/renovation project will offer an opportunity for future expansion of the Department when it is completed in the Fall of 1979. Greenville is a college community located in Northwestern Pennsylvania and is easily accessible to recreational facilities and the Youngstown, Cleveland, Erie and Pittsburgh metropolitan areas. Send resume to: Personnel Department, The Greenville Hospital, 110 N. Main Street, Greenville, Pa. 16125. We are an Equal Opportunity Employer.

**NUCLEAR MEDICINE TECHNOLOGIST,** registered or eligible, for 511 bed teaching hospital in sunny California. F.T. day position, call every 4th weekend. Send resume or contact: Personnel Department, Mercy Hospital and Medical Center, 4077 Fifth Ave., San Diego, CA 92013.

**RADIATION PHYSICIST (NUCLEAR Medicine Physics)** at the University of Florida College of Medicine, to begin July 1, 1979. Basic assignment is development of computer programs for nuclear cardiology and nuclear renal medicine. Ph.D. in computer-related science or equivalent experience required. Experience with computers necessary. Rank and salary dependent upon qualifications and experience of the applicant. Application deadline is May 1, 1979. Contact Dr. Clyde Williams, Chairman of the Department of Radiology. An Equal Opportunity Employer, Affirmative Action Employer.

**NUCLEAR MEDICINE TECHNOLOGIST—**Registered or registry eligible technologist for full time position in modern 410 bed acute care hospital. St. Mary's is located in a city of 100,000 midway between St. Louis and Chicago. Interested persons should contact the Personnel Office, St. Mary's Hospital, 1800 E. Lake Shore Drive, Decatur, IL 62525. (217) 429-2966.

**NUCLEAR MEDICINE TECHNOLOGISTS.** Expanding Nuclear Medicine department with latest equipment available, seeks Registered Nuclear Medicine Technologists for imaging procedures. Large teaching 900-bed hospital provides services for connected 200-bed children's hospital also. Excellent fringe benefits with salary negotiable. Located just 15 minutes from beautiful Va. Beach. Send detailed resume to Mrs. Paulette Mason, Interviewer, Personnel Department, Medical Center Hospitals, Inc., Norfolk General Division, 600 Gresham Drive, Norfolk, Virginia 23507. Telephone (804) 628-3831. An Equal Opportunity Employer M/F/H.

**COORDINATOR OF NEW NMT PROGRAM** (Associate Degree)—\$18,000-\$21,000—B.S. degree/equivalent. Teaching/administrative experience preferred. Contact Dr. Chester Hastings, V.P., Program Development, McLennan Community College, 1400 College Drive, Waco, Texas 76708—(817) 756-6551. E.E.O. employer.

**NUCLEAR MEDICINE TECHNICIAN.** Expanding 485 bed hospital is seeking qualified individual for the position of Nuclear Medicine Technician. Must be a graduate of an AMA approved School of Nuclear Medicine. Prefer up to two years experience in Nuclear Medicine. Excellent salary and employee benefits. Contact: The Department of Human Resources, The Baptist Medical Center-Montclair, 800 Montclair Road, Birmingham, Alabama 35213. An Equal Opportunity Employer.

**NUCLEAR MEDICINE TECHNICIAN.** THE Baptist Medical Center-Montclair is accepting applications for the position of Nuclear Medicine Technician. The department is equipped with three cameras and two scanners; addition of a computer is planned. Must be a graduate of an AMA approved School of Nuclear Medicine Technology and have up to two years experience in a wide range of related procedures. Excellent salary and employee benefits. Send resume in confidence to: Department of Human Resources, The Baptist Medical Center-Montclair, 800 Montclair Road, Birmingham, Alabama 35213. An Equal Opportunity Employer.

**NUCLEAR RADIOLOGIST — THE DEPARTMENT** of Radiology at the University of Florida College of Medicine is currently recruiting for the position of Section Chief of Nuclear Radiology Service, to begin July 1, 1979. Certification in Diagnostic Radiology necessary. One or more years additional training in nuclear radiology required. Instructor or Assistant Professor rank. Salary subject to qualifications and experience of the applicant. Application deadline is June 1, 1979. Contact Dr. Clyde Williams, Chairman of the Department of Radiology. An Equal Opportunity Employer, Affirmative Action Employer.

**RADIATION PHYSICIST - PH.D. IN RADIATION** physics at the University of Florida College of Medicine, to begin July 1, 1979. Responsibilities for research and teaching with primary emphasis on research. Some practical experience is desirable. Instructor or Assistant Professor rank. Salary subject to qualifications and experience of applicant. Applications due May 1, 1979. Contact Dr. Walter Mauderli, Chief of Radiation Physics. An Equal Opportunity Employer, Affirmative Action Employer.

## POSITIONS WANTED

**REGISTERED NUCLEAR MEDICINE Technician (ARRT)** with B.S. degree and 15 years experience, includes setting up a department desks position as an instructor, preferably clinical also would consider research. Desire employer to pay moving expenses from New York State. Available in August. Reply: Box 502, Society of Nuclear Medicine, 475 Park Avenue South, New York, N.Y. 10016.

**NUCLEAR MEDICINE TECHNOLOGIST** with Associate and Bachelors degrees; certified with the Certification Board, registered ASCP in Nuclear Medical Technology, ARRT in Nuclear Medicine Technology and Radiography. Graduate of AMA approved training programs for Nuclear Medicine Technology and Radiography. Eleven years experience in-vivo and in-vitro procedures. Some RIA's. Administrative experience, some supervisory experience along with teaching experience. Wants Supervisory position or better in South East; prefer Florida. Reply Box 500 SNM, 475 Park Ave. So., New York, New York 10016.

**NUCLEAR MEDICINE PHYSICIAN,** ABNM certified, Ph.D., M.D., internal medicine background. Academic, clinical and administrative experience. Will consider university or community hospital. Reply Box 503, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

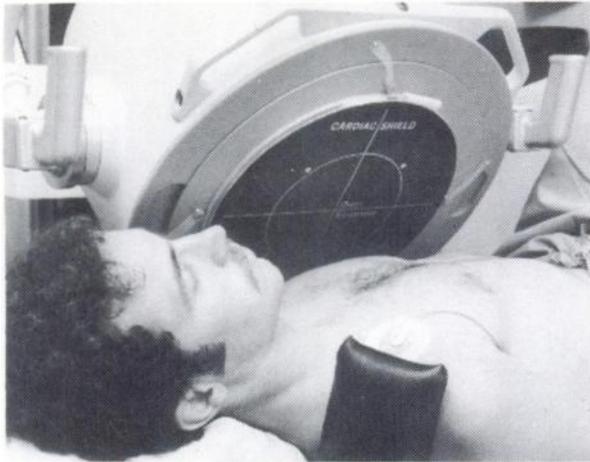
**NUCLEAR PHYSICIAN—ABNM CERTIFIED,** with strong academic credentials and substantial clinical experience, seeks new position. Reply: Box 504, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

**REGISTERED NUCLEAR PHARMACIST** with Ph.D. degree. Experience: 3 years teaching in College of Pharmacy and 4 years in a hospital. Seeking new position. Reply to Box 501, Society of Nuclear Medicine, 475 Park Ave. South, New York, N.Y. 10016.

**Perform  
a death-  
defying  
act.**

**Stop  
smoking.**

Give  
Heart  
Fund   
American Heart Association



# CARDIAC SHIELD

ELIMINATES NON-TARGET PHOTONS

## 7-day FREE trial!

\$95 SMALL, \$125 LARGE

Phone or write on your professional letterhead:  
**O'NEILL INC.**  
 221 FELCH STREET,  
 ANN ARBOR, MI, 48103  
 AREA 313/973-2335



Visit us at booths #670, 672 in Atlanta, at the SNM show

### RADIOPHARMACIST

A Radiopharmacist is required for an established radiopharmacy centre serving hospitals in the City of Edmonton. Laboratory facilities are located on the University of Alberta campus and a full range of nuclear and chemical analytical equipment is available.

The successful applicant will be responsible for radiopharmaceutical preparation and quality control with technical assistance. Other duties will include development of new and improved radiopharmaceuticals and instruction of medical, radiopharmacy and technical students.

Applicants should provide a curriculum vitae, names of three references and salary requirements. Apply to:

**Director of Personnel**  
**Provincial Cancer Hospitals Board**  
**11560 University Avenue**  
**EDMONTON, Alberta**  
**T6G 1Z2**

### REGISTRY REVIEW PROGRAM

A comprehensive review of the Basic Science and Clinical aspects of Nuclear Medicine Technology to be held in Cleveland, Ohio April 30 through May 4, 1979. The Program will be tailored to the makeup of the NMTCB.

For information write:

**Paul J. Early**  
**Nuclear Medicine Associates, Inc.**  
**9726 Park Heights**  
**Cleveland, OH 44125**  
**(216) 663-7000**

### NUCLEAR MEDICINE TECHNOLOGIST

Registered or registry eligible Nuclear Medicine Technologist required for imaging and in vitro assays. We are a 262-bed hospital in the suburb of Akron, Ohio. Good salary and benefits. Contact the Personnel Department, Cuyahoga Falls General Hospital, 1900 23rd St., Cuyahoga Falls, Ohio 44223. (216-929-2911, extension 371).

The Eleventh Annual Seminar in Nuclear Medicine will be held at Colby College and the Mid-Maine Medical Center in Waterville, Maine, August 12-17, 1979. Thirty hours of lectures, breakfast workshops and interesting cases will be provided by Drs. Henry N. Wagner, Jr., Thomas G. Mitchell, Philip O. Alderson, Eileen Nickoloff, John G. McAfee, Barry A. Siegel, and James K. Langan, RT, NMT Accredited Category I, PRA. Families welcome. Inquiries: **Robert H. Kany, Director, Special Programs, Colby College, Waterville, Maine 04901.**



# SEND YOUR SURVEY METERS TO THE EXPERIENCED PROFESSIONALS FOR CALIBRATION.

**Health Physics Associates, Ltd.**, servicing the radiation safety field since 1961, specializes in survey meter repair and calibration...with guaranteed results. All work is performed Accurately, Promptly and Thoroughly by electronic specialists and supervised by qualified physicists certified by the American Board of Health Physics. Instrument calibration is normally **completed in 24-48 hours**. Health Physics Associates, Ltd., services most radiation safety instruments including Geiger Counters, Ionization Chambers, Portable Scintillation Counters, and Direct and Indirect Reading Dosimeters. These services include:

- full preventive maintenance check
- repair and replace all defective components
- all services fully insured
- zero drift and radiation field drift checks
- calibration accuracy of  $\pm 10\%$
- meets or exceeds all Federal, State, Local and JCAH requirements
- shipping cases and loaner instruments available

**INSTRUMENT SERVICE RECORD**

Model # \_\_\_\_\_ Serial # \_\_\_\_\_

Calibration Date \_\_\_\_\_

Calibration Source \_\_\_\_\_

Maintenance Date \_\_\_\_\_

Due for Recalibration \_\_\_\_\_

This instrument meets NRC 10 CFR 34.24 standard. It should be returned for recalibration on date shown for compliance with above and various states requirements. Return to:

**HEALTH PHYSICS ASSOCIATES, LTD.**

**Health Physics Associates, Ltd.**, also offers these services:

- Leak/wipe tests (mail or personal)
- NRC and State License preparation
- Radiation safety services to meet NRC and State regulations (e.g. Surveys, calibrations, standards)
- Quality Assurance Programs for Nuclear Medicine Departments
- Continuing education programs for staff and laboratory personnel
- Decontamination services
- Emergency room radioactivity services

For more information, write or call us.

**HEALTH PHYSICS ASSOCIATES, LTD.**  
 3304 Commercial Avenue  
 Northbrook, IL 60062  
 312/564-3330  
*Providing Radiation Safety Services Since 1961*

Please send more information on:

NAME	TITLE
HOSPITAL	DEPARTMENT
ADDRESS	
CITY	STATE
	ZIP CODE

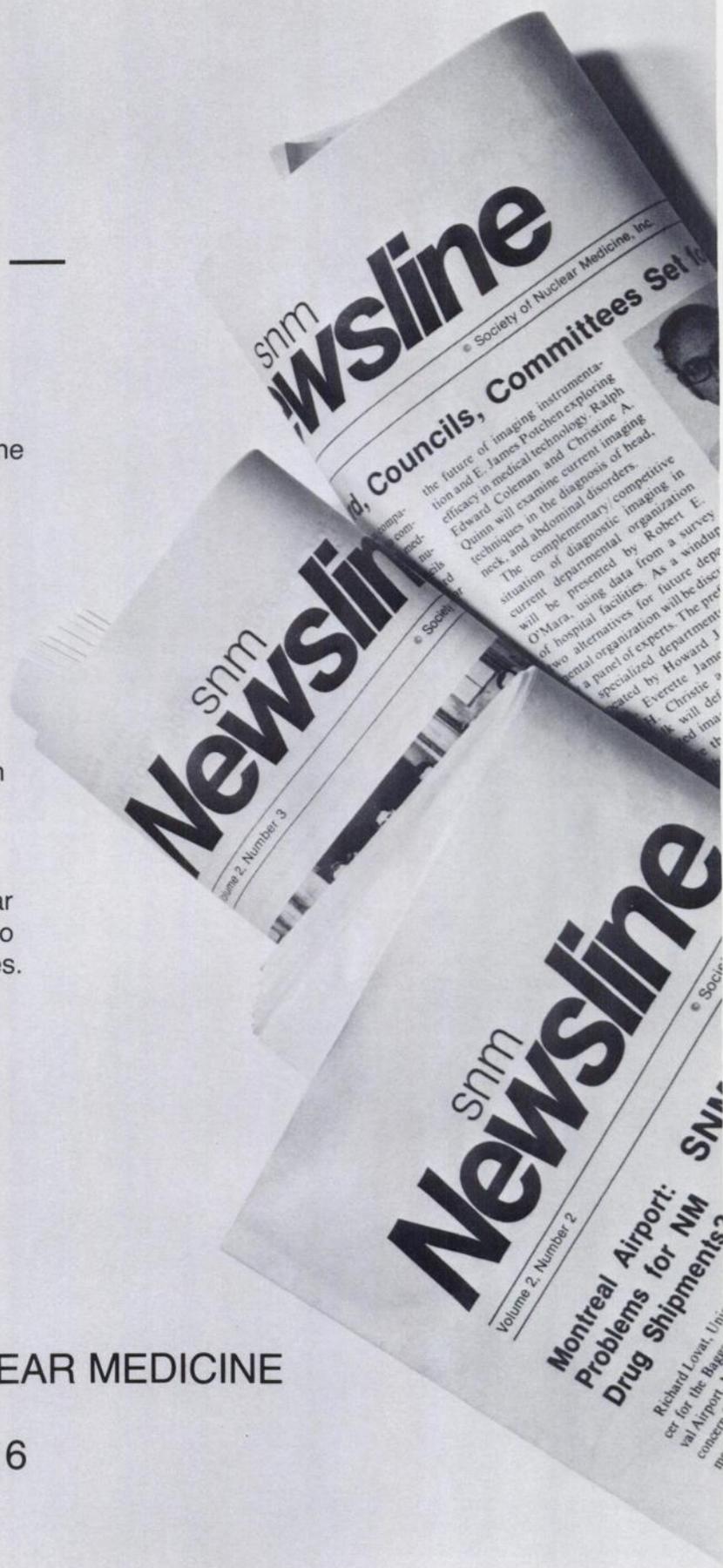
## The newspaper of nuclear medicine —

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

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

Published bimonthly, 11 × 15" size, 12 pages an issue, 6 issues a year.  
Subscription Rates: \$15.00 a year in the U.S.A., \$17.00 elsewhere.

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





# Back to Basics!

## The Assayer 1 by Radx

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

By customer demand, Radx has gone "Back to Basics" and developed the Assayer 1, a simple dose-calibrator, a reliable dose-calibrator, an economical dose-calibrator.

The return to basics does not require a

return to the 1960's technology. The Assayer 1 is microprocessor controlled, totally solid state, with a method of isotope selection way ahead of its time (an optical scanner) which is so precise, reproducible, and reliable that it will soon be copied.

It is not a gadget, it calibrates doses accurately, with precision and unprecedented reliability. It's the Assayer 1—\$2495.

Call today for the last dose-calibrator you'll ever own.

### **RADX**

P.O. Box 19164 • Houston, Texas 77024 • (713) 468-9628



# ELECTRONIC ZOOMER

ENLARGES ANY-SIZE CAMERA IMAGE

## 7-day FREE trial!

Phone or write on your professional letterhead:  
O'NEILL INC.  
221 FELCH STREET,  
ANN ARBOR, MI, 48103  
AREA 313/973-2335



Visit us at booths #670, 672 in Atlanta, at the SNM show

### JNM CLASSIFIED PLACEMENT SERVICE SECTION

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 50¢ 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 75¢ per word. Display advertisements are accepted at \$110 for 1/4 page, \$155 for 1/2 page, \$260 for 1/2 page, and \$450 for a full page. Closing date for each issue is the 1st of the month preceding publication. Agency commissions and cash discounts are allowed on display ads only. Box numbers are available for those who wish them.

All classified ads must be prepaid or accompanied by a purchase order. Send orders to:

**Journal of Nuclear Medicine**  
475 Park Ave. South  
New York, NY 10016

### Just Published!

## NUCLEAR MEDICINE SCIENCE SYLLABUS

The **NUCLEAR MEDICINE SCIENCE SYLLABUS** is the first and only guide to the literature (including books, book chapters, reports, and journal articles) on a broad range of topics in nuclear medicine science.

In the form of a comprehensive outline of the field, each subject is liberally referenced to pertinent sources of information. References are keyed at two levels: "general references" provide a broad overview of each topic; and "additional references" deal with subjects in greater depth or provide historical insight.

Published by the Society of Nuclear Medicine, the 169 page SYLLABUS is printed on loose leaves and comes in an attractive 3-ring binder. Priced at \$30.50, copies may be ordered on the attached coupon or by writing to: **Book Order Dept., Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.**

Payment or purchase order must accompany orders.

**SEND TO:** Book Order Department  
Society of Nuclear Medicine  
475 Park Ave. So.  
New York, NY 10016

Send \_\_\_\_\_ copies of the **NUCLEAR MEDICINE SCIENCE SYLLABUS** at \$30.50 each. (For orders sent outside the United States, please add 10% for postage and handling.)

Total enclosed: \$ \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

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

Make checks payable to: Society of Nuclear Medicine

The **NUCLEAR MEDICINE SCIENCE SYLLABUS** has chapters on:

- Mathematics and Physics
- Anatomy, Physiology, and Medical Terminology
- Radiation Protection
- Diagnostic Imaging and Function Techniques
- In Vitro Techniques
- Radiation Detection and Instrumentation
- Radiation Biology
- Radiochemistry and Radiopharmaceuticals
- Therapeutic Techniques
- Computers and Data Processing
- Miscellaneous (including: Administration, Ethics, and Emergency Procedures)

**NEW  
LEGISLATION  
DEMANDS!**

**IMPROVED  
CONTAMINATION  
MONITORING**



**USE THE CM6**

FOR ACCURATE MONITORING OF ALL SURFACES, CLOTHING AND TOOLS

- Used with GM, scintillation or gas flow probes.
- Indication by meter in derived working limits.
- Automatic gamma compensation.
- Simultaneous alpha and beta measurements (using DP2 probe.)
- Unambiguous audible/visual indication for alpha/beta contamination.



**NUCLEAR  
ENTERPRISES  
LIMITED**

Bath Road, Beenham, Reading RG7 5PR,  
England. Tel. 073-521 2121 Telex 848475.  
Cables: Devisotope, Reading.



Associated Companies:  
Nuclear Enterprises GmbH, Munich;  
NE Nuclear Enterprises S.A., Geneva;  
Nuclear Enterprises Inc. San Carlos, California.

**<sup>125</sup>I RIA  
Kits &  
Controls**

<sup>125</sup>I— STEROIDS

**ESTRIOL** Fast & Direct Test

**ESTRADIOL  
PROGESTERONE**  
Direct Test

PLACENTAL PROTEINS

Quantitative & Qualitative

**HCG-β** Highest Sensitivity (1 mIU/ml)

**HPL** Stat Test for Placental Dysfunction

OTHER POLYPEPTIDES

**MYOGLOBIN**

Direct Test

DRUGS

**GENTAMICIN  
TOBRAMYCIN**

Solid phase, Direct, No Dilutions

NEONATAL

Manual & Automated

**Neo-T<sub>4</sub>/Neo-TSH**

(Automated on Centria® )  
Direct on Blood Spot  
Confirmatory, Double Ab

THYROID FUNCTION

**T<sub>3</sub>, T<sub>4</sub>, TSH** Double Ab

**TBG** with Free T<sub>4</sub> Assessment

**T<sub>3</sub>** Uptake— Low Cost

CONTROLS

**NMS-I** Up to 45 Low Values

**NMS-II** Up to 45 High Values

**NMS**

**Nuclear Medical Systems, Inc.**

1533 Monrovia Ave.  
Newport Beach, CA 92663  
(714) 645-2111

**800-854-3002**

**The Next Logical Step for the  
Well Equipped Nuclear  
Medicine Department is  
Nuclear Tomography.**

---

---

**Tomogscanner  
Tomogscanner  
Tomogscanner  
Tomogscanner**

Tomogscanner Corporation  
1300 Grove Avenue  
Barrington, Illinois 60010  
312 381 8313

See Tomogscanner at Island V in Atlanta.

Your partner in Quality Control

# SQUIBB Q.C. ANALYZER

## Accurate

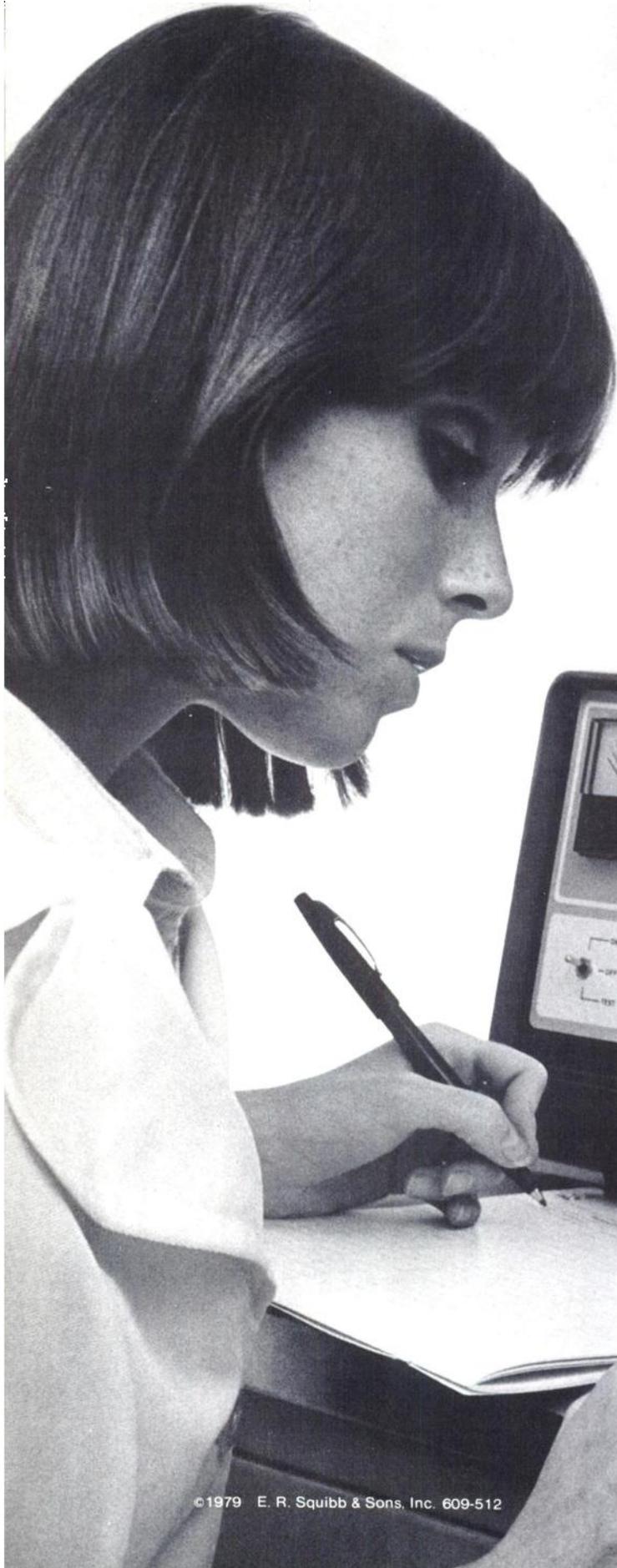
Displays percent of total radioactivity which appears as the bound or hydrolyzed fraction of radiopharmaceutical chromatographic separation. Measurement accuracy:  $\pm 0.3\%$ . Self-contained, pre-programmed computer/counter designed to count, store, analyze and read out results digitally.

## Easy

Simple-to-perform procedure. Isotope energy independent and can be used for the analysis of any radioisotope or radiopharmaceutical.

## Rapid

Analysis completed in 5-15 minutes. Calculation of results automatically programmed internally, independently of operator.

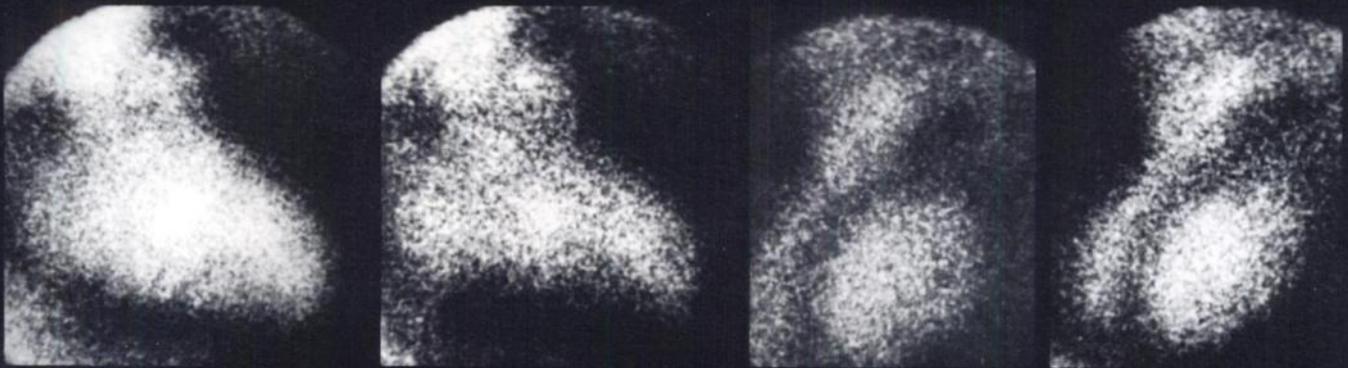


Medotopes

E. R. Squibb & Sons, Inc.  
P.O. Box 4000  
Princeton, N.J. 08540



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



RAO, DIASTOLE

RAO, SYSTOLE

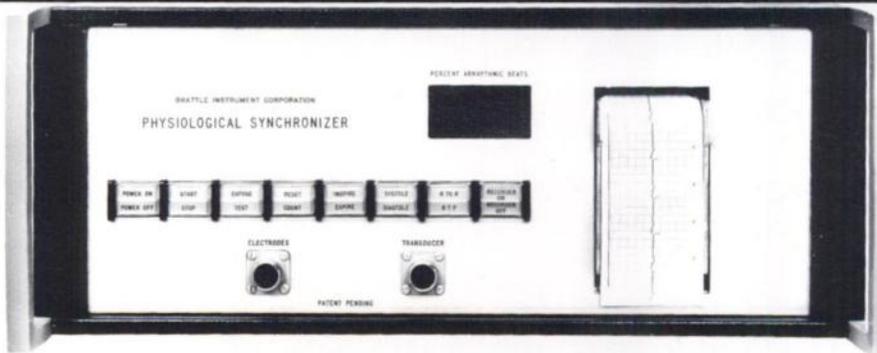
LAO, DIASTOLE

LAO, SYSTOLE

The RAO view shows akinesis of the lower antero-lateral wall and apex; and contraction of the inferior wall and high up the antero-lateral wall. The LAO view shows good contrac-

tion posteriorly and akinesis of the septal aspect of the chamber. Patient was injected IV with 20mCi of  $^{99m}\text{Tc}$ -labelled Human Serum Albumin. The agent was prepared using the New

England Nuclear Electrolysis Kit for labelling HSA. Write or call for a portfolio of Brattle-gated lung, liver and heart studies.



## No knobs, no meters, no errors

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

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

## Brattles lock onto patients—and stay locked on

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

cause we stay right with him. Brattles contain an ECG to track heart, a plethysmograph to track respiration, and a tiny computer to deduce systole and diastole times from the heart signal. And because it's all built in, your operator need not be a physiologist.

## We don't cover our tracks—we print them

The panel lights flash whenever the patient reaches the selected phases; and pushing the RECORDER-ON button gets you an ECG tracing marked with breathing and camera-on times. You can verify function before, during and after exposure.

## A single pair of axillary electrodes captures both heart and breath

It's easy. And we supply disposable, pre-filled electrodes.

## Some Brattles have been in clinical use for over three years—

in community and major hospitals. More than half of our instruments are in community hospitals and the list is growing rapidly. Upon request, we'll supply names of happy users in your area.

## What's the next step?

### Get in touch

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

## Brattle Instrument Corporation

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

# UNION CARBIDE

## MEANS NUCLEAR MEDICINE.

Since 1962, UNION CARBIDE has played a vital role in nuclear medicine that has led to a broadly integrated product line of diagnostic chemicals and instrumentation . . . unit dose radiopharmaceuticals . . . reagent kits for a wide range of organs and functions . . . whole body imagers . . . gamma cameras . . . image processors . . . and emission systems for brain and body tomography.

**Look Into Life . . .**



**Medical Products Division**  
270 Park Avenue  
New York, New York 10017