Radioiodine is trapped by the thyroid and organified in the synthesis of thyroxine. $^{99m}$TcO$_4^-$ is also trapped by the thyroid but is not organified. Consequently, Tc$^{99m}$ activity does not always indicate the physiologic condition of the thyroid.\(^1\)

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 Tc$^{99m}$, necessitating a confirmatory radioiodine scan.\(^2,3\)

Radioiodine thyroid imaging is preferred to Tc$^{99m}$ in such instances as investigation of patients with possible retrosternal thyroid tissue or with unsatisfactory Tc$^{99m}$ images due to poor radionuclide concentration.\(^3\)

---


\(^2\) 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.

Organization 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 "¹²⁵I" image.

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.

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: The radiopharmaceutical should not be administered to children or to patients who are pregnant or women who are 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 menstruation. 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 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.
AT LOWER COST

You can reduce the costs of recording nuclear images by specifying Kodak transparency films. And the images you obtain will be clear, informative, and durable.

Typically, the initial cost of Kodak transparency film is lower than paper prints. And in addition, you can record multiple images on a single sheet or strip of film, and this can make for considerable savings.

You get excellent display of information, of course, because transparency film provides that "see-through" quality and versatility that challenges other methods of imaging.

Kodak transparency films are dimensionally stable and resist curling, so they enable you to store and retrieve records over long periods of time.

For further cost savings, investigate KODAK RP X-OMAT Processors. They can provide you with dry ready-to-read transparencies in a variety of formats in 90 to 150 seconds.

Whatever your needs—single, multiple, or dynamic imaging—Kodak has a film for you, including KODAK Nuclear Medicine NMB or NMC Film, now available in blue or clear base.

For further details, ask your Kodak Technical Sales Representative or your x-ray products dealer. Or write: Eastman Kodak Company, Dept. 740-B, Rochester, New York 14650.
Testosterone testing isn’t hairy anymore.

Until recently, testing for testosterone levels was a long, hairy process. But now, Diagnostic Products Corporation offers an RIA test kit that not only simplifies the job, but gives you specificity greater than any other test available on the market today.

Our kit has the lowest cross-reactivity, only 22% with dihydrotestosterone and virtually none with other androgens, thus eliminating the need for chromatography. Sensitivity is 2 pg. Intra-assay variation is 3%, inter-assay variation is a low 8%. Other benefits include: a simplified one-step extraction procedure that is 98% efficient, individual standards, a short incubation (60 minutes) at room temperature, and a second antibody PEG separation. Results can be achieved in one working day. If you would like more information on how to shave time off testosterone testing, write:

Diagnostic Products Corporation
12306 Exposition Blvd., Los Angeles, Ca. 90064. Call toll free (800) 421-7171, or collect in California (213) 826-0831.
Ohio-Nuclear’s Sigma 420/VIP-550 mobile camera and nuclear medicine computer. The software is designed for nuclear cardiology as well as general nuclear medicine. It images, analyzes, displays and moves almost anywhere. Correlation of the VIP-550’s cardiac software with cineangiography has been proven in the CCU, ICU, ER and in the Stress Lab.

Independent acquisition & display memory: Provides 256 x 256 real image resolution. Acquires and processes a 32 interval gated cardiac study with 64 x 64 resolution 1,024 counts deep.

Drive train: Rugged. Highly reliable. Easy maneuverability in tight spaces. Number one supplier with mobile van services.


48K program memory: Independent of acquisition and display memory. No processing interruptions.

The Tradition Continues.
A single unit integrating the finest

- **Video persistence scope:** More reliable. Improved contrast. Less service expense.

- **¼" crystal:** Improved resolution for low energies.

- **Square hole collimators:** Improved sensitivity. Improved resolution.

- **Four user interactive controls:** Variable gray scale and nondestructive. (1) Background subtraction. (2) Contrast enhancement. (3) Movie mode display rate. (4) Region of interest size control.

- **Standard 5" video monitor:** Displays command sequence of patient images and wall motion studies. Continuous gray scale for images.

- **Joystick:** Makes setting regions of interest easy.

- **ECG isolator:** Eliminates complex external gate.

- **Flexible discs:** 2.4 megabytes of storage capacity. 30 frames/second maximum frame rate for first transit studies. Practical archival storage. Rapid random access to patient studies, BASIC program files and macro protocols. Easy method of upgrading software.

- **Clinical protocols:** First transit ejection fraction. Cerebral blood flow. Shunt evaluation. Effective renal plasma flow.
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
THE EASY WAY TO YOUR PATIENT’S HEART

• RAPID EASY PREPARATION¹
• EXCELLENT BINDING EFFICIENCY²
• STABLE FORMULATION³
• CONVENIENT USAGE METHODOLOGY¹
• CONSISTENT RESULTS²
• UNIT DOSE ECONOMY OR MULTIDOSE UTILITY

Technetium Tc 99m Normal Serum Albumin (Human) Reagent Kit
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.

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®
TECHNETIUM 99m

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

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.

THE JOURNAL OF NUCLEAR MEDICINE
Indications and Usage: Technetium Tc 99m aggregated albumin is a radiopharmaceutical agent used to evaluate pulmonary perfusion. The reconstituted liquid is administered intravenously to patients who have undergone surgery or trauma to evaluate lung perfusion. Any patient with cardiac disease who will undergo administration of the technetium kit should be observed during the first 10 days following the onset of symptoms.

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 vials are sterile and non-pyrogenic. It is essential that the user follow the instructions carefully and adhere to strict aseptic procedures during preparation of the radiopharmaceutical agent. Technetium Tc 99m aggregated albumin is physically unstable and should be used only within the recommended range of temperatures. Failure to mix the vial contents adequately before use may result in non-uniform distribution of radioactivity. The concentration of the Technetium Tc 99m aggregated albumin is approximately 200,000-400,000 counts per minute per milliliter.

Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the use and handling of radionuclides and who have had experience and training in the use of radiopharmaceuticals. Adverse Reactions: The literature contains reports of adverse reactions occurring after the administration of aggregated albumin to patients with pre-existing severe pulmonary hypertension and in patients with pulmonary emboli. These symptoms include tachypnea, hypoxia, and cyanosis. The drug is not recommended for use in these patients.

Usage: Aggregated albumin is a radiopharmaceutical agent used to evaluate pulmonary perfusion. The reconstituted liquid is administered intravenously to patients who have undergone surgery or trauma to evaluate lung perfusion. Any patient with cardiac disease who will undergo administration of the technetium kit should be observed during the first 10 days following the onset of symptoms.

New England Nuclear
Medical Diagnostics Division

Convenient stores at room temperature
Rapidly prepared inject sodium pertechnetate Tc-99m intravascularly, 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

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. Any patient who has had any form of allergy to radiographic contrast media should be evaluated carefully before use. A comprehensive history of allergic reactions should be elicited in each case. The patient should be questioned concerning any history of a reaction to this drug or to Technetium Tc 99m aggregated albumin.

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

Dosage and Administration: The recommended intravenous dose range for the average patient (70kg) is 1 to 4 milliliters. The volume of the dose may vary from 0.2 to 1.3 milliliters.

The recommended number of aggregated albumin particles to be administered per dose is 200,000-400,000 with the suggested range being approximately 350,000.

For ease and accuracy in dispensing the prepared agent, it is recommended that the dosage be determined prior to reconstitution. The total number of aggregated albumin particles to be administered per dose is 200,000-400,000 with the suggested range being approximately 350,000.

Each vial contains 3.6-6.5 x 10^11 aggregated albumin particles. The total volume of the dose is 3-10 milliliters, depending on the patient’s body weight. The dose is usually given by the intravenous or arterial route. The vial should be warmed to body temperature before administration.

The total volume of the dose is 3-10 milliliters, depending on the patient’s body weight. The dose is usually given by the intravenous or arterial route. The vial should be warmed to body temperature before administration.

For further information, contact the manufacturer or the U.S. Pharmacopeia.
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.
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.
You get the system plus the $^{133}\text{Xe}$ for less than you're paying now for $^{133}\text{Xe}$ alone.

Yes, Radx has developed programs where we can provide you with the complete Radx System:

- Ventil-Con — Patient Administration Spirometer
- Xenon Trap — with Detector/Alarm
- Xenon-Kow II — $^{133}\text{Xe}$ Dispenser

Plus all the $^{133}\text{Xe}$ you need in either 1 or 0.5 curie ampules, usually for less than you now pay for $^{133}\text{Xe}$ and disposable bags alone.

Sound hard to believe, try us.

Call today with information on your weekly patient load and monthly cost. We can probably save you money plus supply you with a more versatile, simpler, and safer system.

Now available through Radx: 1.0 and 0.5 curie ampules of $^{133}\text{Xe}$. Call or write for complete information.

from Radx

RADX • P.O. Box 19164
Houston, Texas 77024 • (713) 468-9628
As your diagnostic needs expand...
... GE nuclear systems expand to meet them

The basis of GE's total commitment to nuclear medicine

To provide you with more productive, patient-oriented nuclear imaging systems designed to match your present and future needs. That's our commitment.

With the introduction of the MaxiCamera™ II System to nuclear imaging, GE ushered in new concepts and standards of performance, results, operator convenience, flexible capability with modular electronics, and much more.

The MaxiCamera II scintillation camera system features a counterbalanced detector that allows precise positioning with a touch. Modular electronics provide the flexibility of choosing the level of capability you need. And, of course, exceptional diagnostic results.

DataCamera™, another GE first, is the only mobile scintillation camera system available with data analysis. DataCamera gets to the patient's bedside easily. Its superior positioning capability allows imaging of patients connected to monitoring, life support or traction devices.

DataCamera provides exceptional bedside imaging and data analysis for both nuclear physicians and cardiologists.

The latest technology applied to the latest needs in nuclear diagnostics by people committed to excellence. That's what you get with GE. Contact your GE representative.

General Electric Medical Systems, Milwaukee, Toronto, Madrid.

100 Years of Progress for People

GENERAL ELECTRIC
Your Scintigraphy Kit

Your kit starts with any of our three simple one-step preparations which combined with our new Sterile Technetium-99m Generator offers a complete package for liver, lung, bone and brain scintigraphy. Later we will be adding more kits to our range.

All our kits are tested extensively in clinical trials which include the use of other technetium-99m generators as well as our own. All are terminally sterilized and every batch is animal tested.

Agent for Bone Scintigraphy

Our Technetium (MDP) Agent gives you the best skeletal visualization available today. The high bone uptake and rapid clearance from blood and soft tissue makes this superior to other bone agents giving better definition and improved discrimination.

New Agent for Lung Scintigraphy

Our new Technetium (MAA) Agent offers detailed lung visualization, with no interference from the liver. Particle size is strictly controlled with the majority in the range of 10–80μ.

New Agent for Liver Scintigraphy

The latest addition to our range is the unique Technetium (tin colloid) Agent. Its preparation is much simpler than sulphur colloid agents and requires no heating stage. It will visualize liver and spleen and unlike agents based on phytate, the colloid is formed in the vial, allowing quality control checks prior to injection.

The Radiochemical Centre
Amersham


Digital's Gamma-11 nuclear medicine data analysis system has already proven itself in more than 400 installations. Now we've made it even better.

We've doubled system performance. And lowered price. A complete Gamma-11 acquisition and analysis system now costs less than $50,000. We're offering user-developed Gamma-11 clinical application programs made possible by our new nuclear cardiology software.

We've developed a new interface permitting up to 4 camera connections.

And, we've developed a portable data acquisition unit — the MDA-11 — that you can wheel right up to a patient's bedside. It costs less than $25,000.

So if you're considering a high-speed gamma data acquisition system — or if you're an existing Gamma-11 user interested in increased performance, new application software, or portable data acquisition — write for complete information today.


Please send information on Gamma-11
Please send information on MDA-11
Please have a Digital Medical Systems Specialist contact me

Name_________________________Title________
Hospital__________________________
Address__________________________
City________________State____Zip____
Telephone_______________________Extension____

PRICES APPLY IN U.S. ONLY

Digital Computers in Hospitals
The UNION CARBIDE Hand-held Console . . .
The Only Keyboard You Need.

• The UNION CARBIDE Large Field Gamma Camera hand-held console eliminates the need for a separate operator console.
• The hand-held console looks and works like a pocket calculator, with all controls for presetting study parameters and detector positioning.
• 15’ flexible cable provides complete freedom of movement for the operator.
• Built-in digital display indicates time, count, or count rate at the touch of a button.
• Eliminates need for a second technologist.
• The hand control isn’t the only thing we’ve done just right: even the feet of the camera are specially designed to accommodate wheelchairs, hospital beds and stretchers.

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.

Look Into Life . . .

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

Top — Hepatoma in 31-year-old female with 3.5 mCi Tc99m Sulfur Colloid
Bottom — Subdural hematoma on left, seen in 76-year-old male with 20 mCi D.T.P.A.
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.

Look Into Life . . .
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 (10μCi/M3) 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

THE JOURNAL OF NUCLEAR MEDICINE
The first true direct one-tube assay

New GammaCoat™ 
[125I] 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

Send for data sheet today.

CLINICAL ASSAYS
DIVISION OF TRAVEROL 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.
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.

U.S.A. ELSCINT INC. 138-160 Johnson Avenue, Hackensack, New Jersey 07602, Tel.: 201-487-5885; Telex: 135382.
In other countries — write to: Elscint International Sales & Service Division, Elscint I.S.S.D., Annandale, North End Road, Golders Green, London NW 11 7OY, U.K.

The ELSCINT commitment to excellence
Assessment of acute myocardial infarction in a patient with a suggestive history is often a challenging problem. $^{99m}$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 $^{99m}$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.

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®

See next page for brief summary.

SQUIBB®
PHOSPHOTEC®
Technetium Tc 99m Sodium Pyrophosphate Kit
DESCRIPTION: Phosphotec provides all the nonradioactive components required to prepare a sterile, nonpyrogenic technetated (99mTc) 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 (99mTc) pyrophosphate-tin complex is formed.

INDICATIONS AND USAGE: Technetated (99mTc) 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 child-bearing 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 99mTc 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 99mTc is added, adequate shielding of the final preparation must be maintained. Technetated (99mTc) 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 (99mTc) 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. "

© 1979 E. R. Squibb & Sons, Inc. 609-501
OSTEOLITE bone imaging in orthopedics

"The bone scan may be the only technique capable of locating sites of suspected or unsuspected (bone) trauma."


The superior agent: OSTEOLITE™
Technetium Tc 99m Medronate Sodium Kit (MDP)
In bone trauma...when the X-ray is inconclusive.

Most rapid blood clearance
- 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
The "difference in soft tissue activity (highest with polyphosphate and lowest with MDP) is discernible in clinical images."2
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.3

Result: highest assurance of visualizing all skeletal structures.

Highest target-to-background differential
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:
3. Forstrom L et al: Data on file at New England Nuclear, Medical Diagnostics Division, North Billerica, MA
A 23-year-old graduate student actively engaged in amateur soccer complained of pain in both knees. X-rays of both knees suggested the possibility of a stress fracture only at the right proximal tibia. OSTEOLITE images of the right knee displayed focal uptake in the proximal tibia, consistent with the diagnosis of a stress fracture. A routine anterior view of both knees disclosed a roentgenographically occult stress fracture of the left proximal tibia as well.

Images produced with 19.6 mCi technetium-99m labeled OSTEOLITE; recorded at 500 K counts, Searle LFOV™ camera with MicroDot™ Imager.
**OSTEOLITE™**

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

**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 |
|---------------------------------|------------------|
| **Gamma** | **Mean %** | **Mean Disintegration 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 | Fraction Remaining |
| 0* | 1,000 | 8 |
| 1 | 891 | 9 |
| 2 | 794 | 10 |
| 3 | 708 | 11 |
| 4 | 631 | 12 |
| 5 | 562 | 12 |
| 6 | 501 | 24 |
| 7 | 447 | 63 |

*Calibration Time

**EXTERNAL RADIATION**

The specific gamma ray constant for Technetium Tc 99m is 0.86mCi/hr. at 1cm. The half value layer is 0.2mm of Pb. To facilitate computation of radiation exposure from milliunits amounts of Technetium Tc 99m, the use of a 63.5mm thick standard radiation elution lead shield will attenuate the radiation emitted by a factor greater than 10^-4.

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

<table>
<thead>
<tr>
<th>Shield Thickness (mm)</th>
<th>Coefficient of Attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>0.95</td>
<td>10^-1</td>
</tr>
<tr>
<td>1.8</td>
<td>10^-1</td>
</tr>
<tr>
<td>2.7</td>
<td>10^-2</td>
</tr>
<tr>
<td>3.6</td>
<td>10^-3</td>
</tr>
<tr>
<td>4.5</td>
<td>10^-4</td>
</tr>
<tr>
<td>5.4</td>
<td>10^-5</td>
</tr>
<tr>
<td>6.3</td>
<td>10^-6</td>
</tr>
</tbody>
</table>

**CLINICAL PHARMACOLOGY:** Upon intravenous injection, Technetium Tc 99m OSTEOLITE exhibits a specific affinity for areas of altered osteogenesis. In humans, blood levels fall to 10%-40% 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 proximal 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 asptic 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 and/or 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 pathological 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.

Iodides, ideally examinations using radiopharmaceuticals—especially those effective 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 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 trivalent in the trivalent 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.

**ADAPTED 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.

**DOSEAGE 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 radioactive 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 milliliters of Technetium Tc 99m OSTEOLITE is shown in Table 4.

<table>
<thead>
<tr>
<th>Table 4. Absorbed Radiation Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organ</td>
</tr>
<tr>
<td>Total Body</td>
</tr>
<tr>
<td>Bone Total</td>
</tr>
<tr>
<td>Red Marrow</td>
</tr>
<tr>
<td>Kidneys</td>
</tr>
<tr>
<td>Liver</td>
</tr>
<tr>
<td>Bladder Wall</td>
</tr>
<tr>
<td>Ovaries</td>
</tr>
<tr>
<td>Testes</td>
</tr>
</tbody>
</table>


**NOW SUPPLIER:** 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 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 sixty (60) labeling 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 ensure 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.

**Catalog Number NRP-420 (5 vial kit)**

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

October 1977
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
twogether
for Nuclear Medicine Computers

Two cassettes. Two buttons. The choice of 4:1, or 1:1 is yours at the push of a button. Instantly.
It's the perfect marriage. Easy to use and inexpensive to operate. And coupled to the needs of Nuclear Medicine Computers.

We do it in tandem. Our Model 414 Video Display Camera uses 2 side by side film cassettes. So you can change from 4:1 to 1:1 as easily as pushing a button. On any video-based medical imaging.

No more fussing with dark slides and changing film cassettes every time you want to switch. No more buttons and whistles to recalibrate. When you see an image during the 4:1 mode you want to shoot 1:1, just press the Single Image Expose Button. Then go back to where you left off in 4:1 simply by pushing another button. You won't even lose your place. Or your patience.

But there's more to this merger than mere ease of operation. On-axis photography and a faster lens allow for single-field video recordings. Spot metering gives consistently excellent results from photo to photo, film to film. Microprocessor electronics afford fast, precise operation and reliability. And a high resolution monitor makes sure it all starts out right before anything goes on film.

Four on one. One on one. In one.

Call (415) 957-1600. Or write to Dunn Instruments, P.O. Box 77172, 52 Colin P. Kelly Jr. Street, San Francisco, Ca 94107. We'll show you how to get it twogther for Nuclear Medicine Computers.

Dunn Instruments
Model 414 Video Display Camera
thrombosis
detection of DVT using I-125 fibrinogen

CCC-4TP

- 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
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 ± 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.
World-Wide Acceptance
...Global Availability

ISOCL CLE A N
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
Pinegowrie, 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.

40A
THE JOURNAL OF NUCLEAR MEDICINE
Complete, Self-Contained
Radiopharmaceutical Quality Control System

Tc-99m Labelling Efficiency for only...

$1350.00

AUTOMATIC RADIOCHROMATOGRAM SCANNER (Cat. No. 149-100)
Quickly and accurately analyzes radiochromatography strips.

TECTROL™ Quality Control Test Kit determines Tc-99m labelling efficiency in 30 SECONDS.

• Rapid, Reproducible, Precise.
• Economical...individual tests at half the price of other kits.
• Simple to use...color-coded.
• Precision-engineered instrumentation for easily discernable and dependable results.

FOR COMPLETE INFORMATION WRITE OR CALL —

Atomic Products Corporation
P.O. BOX 657 CENTER MORICHES, NEW YORK 11934 USA
Tel. (516) 878-1074
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
If you’ve waited until now to get started in cardiovascular nuclear medicine...

Thallous Chloride
TI 201
To help rule out, confirm or evaluate

Coronary artery disease

Positive stress ECG without angina

**History**
A.C., 50-year-old accountant, asymptomatic, required to undergo exercise ECG as part of "executive physical."

**ECG findings**
Normal at rest, 2.5-3 mm ST-segment depression on exercise; denied accompanying angina.

**Thallium-201 imaging**
Large apical defect on immediate post-exercise anterior view; defect filled in on delayed images.

**Working diagnosis**
Coronary artery disease, confirmed on preoperative angiography.

Acute myocardial infarction

Early diagnosis

**History**
J.B., 54-year-old construction worker, admitted to CCU following episode of severe chest pain, diaphoresis, dizziness. Patient fell to ground upon onset of symptoms, severely bruising left thigh, chest wall. No history of angina pectoris or prior MI; ECG documented left bundle branch block.

**Serum enzymes, ECG**
Elevated shortly following admission; isoenzyme analysis unavailable to differentiate elevation secondary to trauma from possible elevation secondary to acute MI; ECG nondiagnostic because of LBBB.

**Thallium-201 imaging**
Images made upon admission displayed anterior wall defect (anterior view), large septal defect (LAO view).

**Working diagnosis**
Extensive antero-septal MI.
To start using thallium-201 in your department, you’ll need

A recent model 37 photomultiplier tube camera with all-purpose collimator, capable of resolving 1 cm line separations on an Au 195 line phantom

Treadmill or bicycle ergometer and ECG recorder, to perform maximal stress testing in accordance with good clinical practice

Ability to begin imaging promptly
(within 3–5 minutes) following thallous chloride Tl 201 injection and termination of stress

To get the most out of thallium-201’s total diagnostic capability, you’ll want

Clinical training in scan interpretation at an institution experienced in thallium-201 imaging*

Electronic image acquisition and processing, to help resolve ambiguous studies

Mobile imaging/acquisition instrumentation, to facilitate acute MI thallium-201 studies when patients cannot be transported to the nuclear medicine department

Continuing medical education on thallium-201, for your staff and for your referring physicians*

*Your NEN representative may help recommend an institution in your area. For continuing medical education programming, ask your NEN representative or write: Teaching Program Administrator, New England Nuclear, 549 Albany Street, Boston, Mass. 02118.
Thallous Chloride
TI 201
November 1977

FOR DIAGNOSTIC USE

DESCRIPTION: Thallous Chloride TI 201 is supplied in isotonic solution as a sterile, non-pyrogenic diagnostic radiopharmaceutical for intravenous administration. The aqueous solution at calibration time contains 1 mCi/ml. Thallous Chloride TI 201, adjusted to pH 4.5-6.5 by the addition of hydrochloric acid and/or sodium hydroxide solution. It is made isotonic with 0.9% sodium chloride and is preserved with 0.9% benzyl alcohol. Thallium TI 201 has a half-life of 73.1 hours and is cyclotron-produced. It is essentially carrier-free, and contains less than 0.25% lead Pb 203 and less than 1.9% Thallium TI 202.

PHYSICAL CHARACTERISTICS
Thallium TI 201 decays by electron capture to Mercury Hg 201 with a physical half-life of 73.1 hours.1 Photons that are useful for detection and imaging are listed in Table 1. The lower energy X-rays obtained from the Mercury Hg 201 daughter of TI 201 are recommended for myocardial imaging, because the mean /4 disintegration at 68-80.3 keV is much greater than the combination of gamma 4 and gamma 6 mean /6 disintegration.

Table 1. Principal Radiation Emission Data

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Mean Energy (keV)</th>
<th>% Disintegration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma 4</td>
<td>135.3</td>
<td></td>
</tr>
<tr>
<td>Gamma 6</td>
<td>167.4</td>
<td></td>
</tr>
<tr>
<td>Mercury X-rays</td>
<td>66-80.3</td>
<td></td>
</tr>
</tbody>
</table>

Martin, M.J., Nuclear Data Project, ORNL, January 1977

EXTERNAL RADIATION

The specific gamma ray constant for Thallium TI 201 is 0.47R/mCi/hr at 1 cm. The first half-value layer is 0.2 mm of lead. A range of values for the relative attenuation of the radiation emitted by this radionuclide that results from the interposition of various thicknesses of lead (Pb) is shown in Table 2. For example, the use of 4.4 mm of lead will decrease the external radiation exposure by a factor of about 10,000.

Table 2. Radiation Attenuation By Lead Shielding

<table>
<thead>
<tr>
<th>mm of Lead (Pb)</th>
<th>Coefficient of Attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.23</td>
<td>0.5</td>
</tr>
<tr>
<td>0.5</td>
<td>10^1</td>
</tr>
<tr>
<td>1.0</td>
<td>10^1</td>
</tr>
<tr>
<td>1.9</td>
<td>10^1</td>
</tr>
<tr>
<td>3.1</td>
<td>10^1</td>
</tr>
<tr>
<td>4.4</td>
<td>10^1</td>
</tr>
<tr>
<td>5.7</td>
<td>10^1</td>
</tr>
</tbody>
</table>

To correct for physical decay of this radionuclide, the fractions that remain at selected intervals before and after calibration are shown in Table 3.

Table 3. Thallium TI 201 Decay Chart: Half-Life 73.1 Hours

<table>
<thead>
<tr>
<th>Fraction Hours</th>
<th>Fraction Remaining</th>
<th>Fraction Remaining</th>
<th>Fraction Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>1.98</td>
<td>0.88</td>
<td>0.91</td>
</tr>
<tr>
<td>60</td>
<td>1.77</td>
<td>0.80</td>
<td>0.86</td>
</tr>
<tr>
<td>48</td>
<td>1.56</td>
<td>0.75</td>
<td>0.82</td>
</tr>
<tr>
<td>36</td>
<td>1.41</td>
<td>0.71</td>
<td>0.83</td>
</tr>
<tr>
<td>24</td>
<td>1.22</td>
<td>0.67</td>
<td>0.84</td>
</tr>
<tr>
<td>12</td>
<td>1.04</td>
<td>0.63</td>
<td>0.86</td>
</tr>
<tr>
<td>0</td>
<td>0.90</td>
<td>0.60</td>
<td>0.90</td>
</tr>
<tr>
<td>0.5</td>
<td>0.76</td>
<td>0.57</td>
<td>0.92</td>
</tr>
<tr>
<td>0.6</td>
<td>0.69</td>
<td>0.54</td>
<td>0.94</td>
</tr>
</tbody>
</table>

1. Calibration Time

CLINICAL PHARMACOLOGY: Carrier-free Thallous Chloride TI 201 has been found to accumulate in viable myocardium in a manner analogous to potassium. Experiments employing labeled microspheres in human volunteers have shown that the myocardial distribution of Thallous Chloride TI 201 correlates well with regional perfusion.

In clinical studies, thallium images have been found to visualize areas of infarction confirmed by electrocardiographic and enzyme changes. Regions of transient myocardial ischemia corresponding to areas perfused by coronary arteries with partial stenoses have been visualized when thallium was administered in conjunction with an exercise stress test. It is usually not possible to differentiate recent from old myocardial infarction, and no exact differentiation can be made between recent myocardial infarction and ischemia.

After intravenous administration, Thallous Chloride TI 201 clears rapidly from the blood with maximal concentration by normal myocardium occurring at about ten minutes.

INDICATIONS AND USAGE: Thallous Chloride TI 201 may be useful in myocardial perfusion imaging for the diagnosis and localization of myocardial infarction.

It may also be useful in conjunction with exercise stress testing as an adjunct in the diagnosis of ischemic heart disease (atherosclerotic coronary artery disease).

CONTRAINDICATIONS: None known.

WARNINGS: In studying patients in whom myocardial infarction or ischemia is known or suspected, caution is necessary to assess continuous clinical monitoring and treatment in accordance with acceptable procedure. Exercise stress testing should be performed only under the supervision of a qualified physician and in a laboratory equipped with appropriate resuscitation and support apparatus.

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

PRECAUTIONS: Data are not available concerning the effect of marked alterations in blood glucose, insulin, or pH (such as is found in diabetics mellitus) on the quality of thallium TI 201 scans. Attention is directed to the fact that thallium is analogous, and since the transport of potassium is affected by these factors, the possibility exists that the thallium may likewise be affected.

Thallous Chloride TI 201, as all radioactive materials, must be handled with care and used with proper safety measures 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.

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. Thallous Chloride TI 201 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 stopped when a patient is administered radioactive material. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: Adverse reactions related to use of this agent have not been reported to date.

DOSAGE AND ADMINISTRATION: The recommended adult (70 kg) dose of Thallous Chloride TI 201 is 1.5 mCi. Thallous Chloride TI 201 is intended for intravenous administration only. For patients undergoing resting thallium studies, imaging is optimally begun within 10-20 minutes after injection. Several investigators have reported improved myocardial-to-background ratios when patients are injected in the fasting state, in an upright posture, or after briefly stimulating. Best results with thallium imaging performed in conjunction with exercise stress testing appear to be obtained if the thallium is administered when the patient reaches maximum stress and when the stress is continued for 30 seconds to one minute after injection. Imaging should begin within ten minutes post-injection since target-to-background ratio is optimum by that time. Several investigators have reported significant decreases in target-to-background ratios of lesions attributable to transient ischemia by two hours after the completion of stress testing. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

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 government agencies authorized to license the use of radionuclides.

RADIATION DOSIMETRY
The estimated absorbed radiation dose1 to an average patient (70 kg) from an intravenous injection of a maximum dose of 1.5 mCi of TI 201 is shown in Table 4.

Table 4. Radiation Dose Estimates of Thallous Chloride TI 201:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Radiation Dose (mCi)</th>
<th>Radiation Dose (mCi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>0.51</td>
<td>0.51</td>
</tr>
<tr>
<td>2.0</td>
<td>0.57</td>
<td>0.57</td>
</tr>
<tr>
<td>1.0</td>
<td>0.51</td>
<td>0.51</td>
</tr>
<tr>
<td>0.5</td>
<td>0.51</td>
<td>0.51</td>
</tr>
</tbody>
</table>

1. Values listed include a maximum correction of 10% to the radiation doses from TI 201 due to the radioactive contaminants Pb 203 and TI 202.

HOW SUPPLIED: Thallous Chloride TI 201 for intravenous administration is supplied as a sterile, non-pyrogenic solution containing at calibration time, 1 mCi/ml of Thallous Chloride TI 201, 9 mg/ml sodium chloride, and 5 mg/ml of benzyl alcohol. The pH is adjusted to between 4.5-6.5 with hydrochloric acid and/or sodium hydroxide solution. Vials are available in the following quantities of radioactivity: 1.5, 3.0, 4.5, 6.0, and 9.0 millicuries of Thallous Chloride TI 201. The contents of the vial are radioactive. Adequate shielding and handling precautions must be maintained.

Catalog Number NPP-427
Rapid, two-step automatic elution

Safe positive pressure system

Convenient, well-shielded eluate vial container

Reliable performance and consistently high yields from our unique generator column, proved over many years

Effective shielding, minimizing radiation dose to the user

Easy to lift and handle

Reliable service and supply. Despatched on any weekday

Introducing our second generation generator

The Radiochemical Centre Amersham
The Radiochemical Centre Limited, Amersham, England. Tel: Little Chalfont (024 04) 4444
In West Germany: Amersham Buchler GmbH & Co KG, Braunschweig. Tel: 05307-4693-97
New A² Image Processing Systems are designed with multi-task/multi-station/multi-user capabilities. The A² computer console stays put at a central location. It directs data traffic, searches files, records images and manages the remote operation of terminal stations located where they are needed and available when they are needed. Images from one, two, or three gamma cameras can be acquired, processed and displayed simultaneously. A² Systems not only speak and respond in English, they let you abbreviate in simple two letter commands prompted on the terminal screen in easy to read exclusive menu formats. In other words, learning how to use an A² System is as simple as reading and selecting from a menu — in English!

A² Systems truly excel in image quality. Images may be displayed with up to 256 levels of either color or grey in a variety of matrix formats up to 512 x 480. Dynamic images may be automatically acquired at rates up to 48 frames per second. Simultaneous MUGA™, Multiple Gated Acquisition, studies, or "heart movies," up to 128 images representing a full cardiac cycle, can be collected to view wall motion or to generate volume curves and calculate ejection fractions. MUGA™ is a technique pioneered by MDS for assessing cardiac wall motion and left ventricular function.

A² Systems offer greater convenience and simpler operation. They also add a new dimension of flexibility and capability to the acquisition, processing and display of images from one, two, or three gamma cameras.

Please ask us to show you through a demonstration the many benefits that can be derived from an A² System in a modern diagnostic imaging program. Write or call us today.

See the new A² System in Island 40 at the American College of Cardiology meeting March 12-15.
Way, Multiple Points Than One!

MDS products, hardware and software, are tools for diagnosis and research which do not come in contact with, and cannot cause direct injury to the patient. Refer to the operation manual and instructions accompanying the gamma camera and injectable imaging agent for further information on their use. To ensure proper clinical results, an MDS product must be used under the direction of, and using procedures verified by a qualified physician.

MDS Medical Data Systems
division of Medtronic, Inc.
2311 Green Road
Ann Arbor, Michigan 48105
313 769 9353
Telex 235794

Medical Data Systems International
Abbey Road, Blackrock
County Dublin, Ireland
As nuclear medicine has matured and progressed so has the development of the Ultra-TechneKow® FM Tc99m Generator. In keeping pace with the changing needs of the nuclear medicine community, we have redesigned the Ultra-TechneKow system and further refined those features that have, through the years, made the Ultra-TechneKow Generators among the safest, easiest-to-operate, and most reliable performing technetium delivery systems in the world.

An important part of the total system is our commitment to provide the best overall, on-time-delivery record in the industry. The Customer Service people have established a reputation for solving some of the most difficult routing problems imaginable.

We invite you to evaluate our evolutionary system and challenge the people in Customer Service to demonstrate why they're the best, at what they do, in the industry. Contact your local Mallinckrodt representative or call Don Burkhead at 314-895-0247.

Here are a few of the changes that make the latest Ultra-TechneKow easier to use and more reliable than ever:

- **Redesigned canister:**
  For easier lifting and maneuverability, the canister has a large firm top handle. Change in design simplifies engaging and removing the Luer-lock needle on a daily basis; an important feature in maintaining sterile elution technique.

- **New valve system:**
  Provides positive protection against accidental elution or leakage.

- **Better shielding:**
  To reduce radiation levels during elution, an additional lead plate has been inserted inside between the tubing and the canister.
  A redesigned auxiliary shield is available that provides added reduction in surface radiation levels on all sides and the top.

- **Reduced weight (smaller units):**
  A change in the configuration of the internal column shield allows weight reduction of our smaller generators.

See following page for brief summary.
INTRODUCING...
Our latest Evolutionary Technetium delivery system.

Ultra-TechneKow® FM
(Technetium Tc-99m Generator)
For the Production of Sodium Pertechnetate Tc 99m

DESCRIPTION
The Ultra-TechneKow FM Generator is prepared with fission-produced molybdenum-99. This generator provides a closed system for the production of sterile metastable technetium-99m, which is produced by the decay of molybdenum-99. Sterile, pyrogen-free isotonic solutions of Sodium Pertechnetate Tc 99m can be obtained conveniently by periodic aseptic elution of the generators. These solutions should be crystal clear.

The generator consists of a sealed glass chamber containing specially processed alumina. This treated alumina has a high absorption capacity for molybdenum-99 and a low affinity for technetium-99m. As a result, elution of the generator yields a solution of technetium-99m containing negligible amounts of molybdenum-99.

ACTIONS
The pertechnetate ion distributes in the body similarly to the iodide ion but is not organified when trapped in the thyroid gland. Pertechnetate tends to accumulate in intracranial lesions with excessive neovascularity or an altered blood-brain barrier. It also concentrates in thyroid gland, salivary glands, stomach and choroid plexus. After intravascular administration it remains in the circulatory system for sufficient time to permit blood pool, organ perfusions, and major vessel studies. It gradually equilibrates with the extracellular space. A fraction is promptly excreted via the kidneys.

INDICATIONS
Sodium pertechnetate Tc-99m is used for brain imaging, thyroid imaging, salivary gland imaging, placenta localization and blood pool imaging.

CONTRAINDICATIONS
None.

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

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

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

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

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

ADVERSE REACTIONS
None.

DOSAGE AND ADMINISTRATION
Sodium pertechnetate Tc-99m is usually administered by intravascular injection but can be given orally. The dosage employed varies with each diagnostic procedure.

The suggested dose range employed for various diagnostic indications is as follows:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Dose Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain imaging</td>
<td>10 to 20 mCi</td>
</tr>
<tr>
<td>Thyroid gland imaging</td>
<td>1 to 10 mCi</td>
</tr>
<tr>
<td>Salivary gland imaging</td>
<td>1 to 5 mCi</td>
</tr>
<tr>
<td>Placenta localization</td>
<td>1 to 3 mCi</td>
</tr>
<tr>
<td>Blood pool imaging</td>
<td>10 to 20 mCi</td>
</tr>
</tbody>
</table>

NOTE: Individual dose should be limited to 10 mCi.

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

HOW SUPPLIED
The Ultra-TechneKow FM (Technetium Tc 99m) Generators contain the following amount of molybdenum-99 at the time of calibration stated on the label.

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.25 curies</td>
</tr>
<tr>
<td>101</td>
<td>0.50 curies</td>
</tr>
<tr>
<td>102</td>
<td>1.0 curies</td>
</tr>
<tr>
<td>103</td>
<td>1.5 curies</td>
</tr>
<tr>
<td>104</td>
<td>2.0 curies</td>
</tr>
<tr>
<td>105</td>
<td>2.5 curies</td>
</tr>
<tr>
<td>107</td>
<td>3.0 curies</td>
</tr>
</tbody>
</table>

Each generator is supplied with the following components for the elution of the generator.

6—Sterile, graduated, evacuated collecting vials
6—Sterile Luer-Lock needles with plastic covers
6—Pressure-sensitive “Caution—Radioactive Material” collecting vial labels
6—Pressure-sensitive radioassay data labels for lead dispensing shield

EVACUATED COLLECTING VIALS. Collecting vials are available on request in 5, 10 and 30 milliliter sizes.

Mallinckrodt, Inc.
P.O. Box 5840
St. Louis, MO 63134

RADIOPHARMACEUTICALS

THE JOURNAL OF NUCLEAR MEDICINE
Harshaw’s TASC-5 Computerized rCBF Analyzer offers the clinical investigator unprecedented flexibility in all phases of rCBF data analysis. And it makes rCBF measurement as a diagnostic procedure a practical reality.

The TASC-5 Computerized rCBF Analyzer is routinely supplied with a computer program—based on the xenon inhalation technique developed by Obrist, et al.* Since the TASC-5 computer controls measurement and analysis functions, minimum operator training is required.

Where existing computer facilities are available, a basic TASC-5 can be interfaced with any RS-232C compatible input. In the event a computer terminal is not available, a tape recorder provides for data storage.

THE HELMET
The Helmet is Harshaw’s unique new probe holder for the advanced TASC-5 Computerized rCBF Analysis System. The clear acrylic helmet provides good visibility when adjusting the probes and eliminates the problem of probe placement duplication for serial studies.

WHAT CAN THE TASC-5 DO FOR YOU?
Call us. We’ll be happy to demonstrate how the TASC-5 Regional Cerebral Blood Flow Analyzer can make efficient, accurate, clinical rCBF measurement practical for you.

For complete information 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
Do your RIA tests give you high blood pressure?

If you’re feeling the pressure of time consuming lab tests, Diagnostic Products Corporation RIA tests are just what the doctor ordered. We specialize in RIA and have for the past seven years. We offer one of the most complete lines of RIA tests available from one source: • ^3^H Aldosterone • ^125^I Aldosterone • ^125^I Amikacin • ^125^I Cortisol • ^3^H Cyclic AMP • ^125^I Digitoxin • ^125^I Digoxin • ^125^I Folic Acid • ^3^H Folic Acid • ^125^I FSH • ^125^I Gentamicin • ^125^I Kanamycin* • ^125^I Neonatal T-4 • ^125^I Neonatal TSH • ^125^I Sisomicin* • ^125^I Testosterone • ^125^I T-3 RIA • ^125^I T-4 RIA • ^125^I T-3U • ^125^I TSH

^125^I Tobramycin
^57^Co Vitamin B-12 and Dual-count™ Every test we market is known for lot-to-lot consistency. Innovation in time saving techniques. Sensitivity. Reproducibility. Specificity. And, most important, quality. Our RIA test kits are available for immediate delivery. And they’re priced so you can afford to use them. If you’d like to put us to the test, or just get more information on our complete line, write:

Diagnostic Products Corporation
12306 Exposition Blvd., Los Angeles, Ca. 90064. Call toll free (800) 421-7171, or collect in California (213) 826-0831.

* Available for research only in U.S.A.
† Combination, Folate and Vitamin B-12.
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®.
NOW AVAILABLE
FOR USE WITH UP TO
90 mCi PER VIAL.

Technetium Tc 99m Aggregated Albumin Kit
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.

Easy to prepare.
Stable formulation prepared with stannous tartrate, which is more resistant to oxidation than stannous chloride.

Lowest dose rate to the lungs of any commercially available kit.

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

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 Techne-
tium 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 x 10^7 ± 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.

bide and competitive package inserts for full lung dosimetry information.

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.
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: ±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.

E. R. Squibb & Sons, Inc. P.O. Box 4000 Princeton, N.J. 08540
Doxorubicin \([^{125}\text{I}]\) (Adriamycin)* Radioimmunoassay Kit

For Investigational Use Only.

High circulating levels of Adriamycin* may result in irreversible myocardial damage, bone marrow depression, and gastrointestinal trauma.\(^1\) Knowledge of circulating Adriamycin* concentrations therefore, is important.

Our \([^{125}\text{I}]\) 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 \([^{125}\text{I}]\) tracer and one hour incubation time makes this kit a unique tool in cancer management.


*Mtradename Adria Labs.

For further information call or write:

Diagnostic Biochemistry Inc.

(714) 452-0950

10457 H ROSELLE STREET • SAN DIEGO, CA 92121
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
- Diposphonate
- Polyposphate
- MDP
- Phytate
- DTPA
- Micropospheres
- Human serum albumin
- Glucoheptonate
- Sulfur colloid
- Macroggregated 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 OBVIOUS SOLUTION

Low* Dissolved Oxygen
Non-preservative normal saline USP

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

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 hypokalemia and acidosis. Excessive amounts by the parenteral 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
5-25 SODIUM CHLORIDE INJECTION U.S.P. 25/10 ml vials
with LOW DISSOLVED OXYGEN
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

Increase 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
RIA Kits-125 & Controls

MYOGLOBIN
For Myocardial Infarct

SERUM or URINE
ESTRIOL
No Extraction No Chromatography

ESTRIOL & HPL
performed simultaneously

GENTAMICIN (Schering)
Unmatched; C.V. = 3

NEONATAL-T4
For hypothyroid screen in newborns

NEONATAL-TSH
Confirmatory test for hypothyroid

TBG
for Free
Thyroxine Assessment

TSH in 5 hrs.
lowest C.V. per CAP results

T3 double Ab; T3 uptake

RIA CONTROLS HAA(-)
Hi & Lo levels - from same pool;
each vial has 40 values — peptides,
steroids, thyronines, drugs & CEA

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 re-
funded. Allow 5 weeks for delivery.
Efficient, a.
1. producing the desired effect or result with a minimum of effort, expense or waste.

Colli'mató'r, n.
1. an array of holes with lead septa that pass gamma radiation to a gamma camera’s crystal in parallel rays.

Efficient col'li'mató'r

1. a new, multi-purpose, parallel-hole collimator combining high resolution with high sensitivity —ideal for imaging with low-energy gamma ray emitters such as Tc-99m, Xe-133 and Tl-201.

2. a collimator ideally suited for stress cardiac studies and others requiring high resolution with “general-purpose collimator” sensitivity.

3. a collimator that reduces imaging time and patient motion effects (because of its high sensitivity) while providing exceptional high resolution.

You no longer have to trade sensitivity for resolution (a typical high-resolution collimator) or resolution for sensitivity (a general-purpose collimator). The “Efficient Collimator” provides both high resolution and high sensitivity in one unit, which means:

- Shorter imaging time
- No collimator changes
- Improved statistical accuracy
- Reduced patient motion effects

For more information, including samples of clinical results with this significant advance in collimator technology, write or call for Bulletin 272-B.

NUCLEAR ASSOCIATES
Division of VICTOREEN, INC.
100 Voice Road • Carle Place, N.Y. 11514 • (516) 741-6360
Four new radioassays you can count on

Our range of outstanding radioassay kits keeps growing, to provide you with the best techniques for research and diagnosis. Each of our new kits is reliable, convenient and simple to use, and maintains the same high standards of manufacture and quality control that you have come to expect.

AFP RIA kit for rapid screening of neural tube defects (NTD)
TSH RIA kit a fast and accurate assay for thyroid stimulating hormone.
Testosterone/Dihydrotestosterone RIA kit for the simple and rapid measurement of both androgens separately or together in research studies only.
B12 Radioassay kit a sensitive and reliable assay for serum B12.

The sign of quality

The Radiochemical Centre
Amersham
Who Needs It...?

...anyone who needs more complete information for an accurate diagnosis. That last piece of the puzzle that so often completes the whole diagnostic picture. Until now it has been elusive...time-consuming. Until now.

The Cordis-Baird System Seventy-Seven® and First-Pass Technology...the modern method for noninvasively producing meaningful diagnostic results and clinical data. Simple...Fast...patient testing that gives all of the information for a more precise and accurate diagnosis.

Static or dynamic information with a versatile precision not yet matched by other radionuclide methods. Why not write today for the whole story on getting the entire picture? System Seventy-Seven...it's all you need to know.

Cordis Corporation
Nuclear Medical Systems Division
Telephone: toll-free
1-800-327-7820, Ext. 2711
P.O. Box 370428,
Miami, Florida 33137
Dicopac®
Oral Cyanocobalamin Co 58, Oral Cyanocobalamin Co 57 Bound to Human Gastric Juice, Cyanocobalamin I.M. Injection

INDICATIONS
Dicopac Kit consisting of cyanocobalamin Co 58 and cyanocobalamin Co 57 combined with human intrinsic factor is used to assess vitamin B₁₂ absorption in the diagnosis of malabsorption due to the lack of intrinsic factor, e.g. Addisonian (pernicious) anemia, and as a diagnostic adjunct in other defects of intestinal absorption.

CONTRAINDICATIONS - None.

WARNINGS
This radiopharmaceutical should not be administered to patients who are pregnant or during lactation unless the information to be gained outweighs the potential hazards. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, on a woman of childbearing capability should be performed during the first few (approximately 10) days following onset of menses. Radiopharmaceuticals should be used only by physicians who are qualified by specific training in the safe use and handling of radionuclides produced by nuclear reactor or particle accelerator and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

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

The test should not be started within 24 hours of a therapeutic dose (1000 μg) of vitamin B₁₂ or within 24 hours of a loading dose of vitamin B₁₂ given for the Schilling test. If bone marrow examinations are to be done, they should precede the administration of this test, as the flushing parenteral dose of vitamin B₁₂ may alter the bone marrow picture.

ADVERSE REACTIONS - None.

One day test for Vitamin B₁₂ malabsorption
Conveniently packaged in 2-test or 5-test kits

Amersham
A SUBSIDIARY OF THE RADIOCHEMICAL CENTRE
2636 S. Clearbrook Dr., Arlington Heights, IL 60005, 312/364-7100 or 800/323-0668 (Toll free)
In Canada
505 Iroquois Shore Rd., Oakville, ONT L6H 2R3, 416/842-2720 or 800/261-5061 (Toll free)
Nuclear Pacific introduces wrap-around protection for your eyes.

Sometimes an extra measure of protection is desired to prevent exposure from both direct and peripheral radiation sources. Nuclear Pacific's new wrap-around radiation shielding glasses give you that extra measure. Lenses, made of Nuclear Pacific's specially developed lead glass, provide 0.60 mm lead equivalent protection. And yet the glasses with frames weigh just 2.8 oz. Lenses are top optical quality, anti-reflection coated (front only) and tempered to meet FDA impact resistance requirements.

Also available: standard format radiation shielding glasses. Weight, 2.5 oz; 0.75 mm lead equivalent protection; tempered and anti-reflection coated.


See us at RSNA, Booth 2208
6701 Sixth Ave. So. Seattle, Wa. 98108 (206) 763-2170
Diagnostic Isotopes introduces AUTO-MATE XENON GAS DISPENSER

Better... because of what you don't have to do!

- Transfer Xenon from one container to another
- Pump a handle to operate
- Puncture vial after it is attached to system
- Interrupt study to administer O₂
- Purchase expensive one-time use products

Yes, the Auto-Mate Xenon Gas Dispenser eliminates a lot of hassle now associated with Ventilation System studies. This new instrument from Diagnostic Isotopes offers the following advantages: simplifies loading; delivers Xenon by merely pressing a button; punctures vial automatically; delivers full dose in a one breath bolus, administers oxygen by simply reattaching dispenser to tubing and works with all delivery and trap systems. The Auto-Mate provides technician safety because the shipping container is the radiation shielding. Made of lightweight aluminum and brass for extreme durability.

Inquire about our complete Xenon Program
225 Belleville Ave., Bloomfield, N.J. 07003
201-429-7590 • Telex 133393 • Call Toll Free: 800-631-1260
“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 tech ops COMPANY
Glenwood Science Park
Glenwood, Illinois 60425 . (312) 755-7000
The journal for all nuclear medicine technologists —

JOURNAL OF NUCLEAR MEDICINE TECHNOLOGY

Six years ago, when it was clear that the new area of nuclear medicine technology was becoming one of the most vital paramedical fields in medicine, the Technologist Section of The Society of Nuclear Medicine started publishing a journal, specifically written and designed for nuclear medicine technologists. The Journal covers all important developments in the field. Its contributors write to share their professional experiences, to enlighten their colleagues, and to further the effectiveness of patient care.

Edited by Pat Weigand, the Journal enjoys excellent contents, and an enthusiastic readership.

Employing the same format as the Journal of Nuclear Medicine, it is a substantial, beautifully produced periodical. It also belongs in every institutional library used by nuclear medicine technologists.

Published quarterly: March, June, September, December.

Subscription Rates: $30.00 a year in the U.S., $32.00 elsewhere.

Note: Subscriptions are entered on a calendar year basis. We are happy to supply back issues for the current volume, or to pro-rate your subscription for the remainder of the current volume.

ORDER FORM

Clip and mail to: The Society of Nuclear Medicine, 475 Park Avenue South, New York, NY 10016, or order through your subscription agent.

Please enter my subscription to:

- Payment of $________ enclosed.
- Purchase Order attached.
- Bill Me.

Name_____________________________________________
Address__________________________________________
City/State/Zip ________________________________

JOURNAL OF NUCLEAR MEDICINE TECHNOLOGY (Volume VII)
- $30.00
- $32.00 (Outside U.S.)

Signature__________________________Date____
If you ordered only a perfusion lung scan on this patient...
...you could have missed the diagnosis.
The new definition of “lung scan”

**Ventilation + Perfusion**

**(SPECIFICITY)**

Xenon-133 ventilation lung imaging reliably increases the specificity of the perfusion study by demonstrating regions of abnormal perfusion — normal ventilation (strongly suggesting PE) or of abnormal perfusion — abnormal ventilation (COPD, effusion or infiltrate).

**(SENSITIVITY)**

Perfusion lung imaging is recognized as the most sensitive noninvasive means of detecting pulmonary embolism (PE). Almost every patient with PE will have an abnormal study — while a normal study virtually rules out PE. But perfusion defects are nonspecific, since both vascular disorders, such as PE, and parenchymal disease or effusion alter pulmonary perfusion.

36-year-old female, 7 years oral contraceptive use, presented with 10-day history of increasing shortness of breath, dyspnea and nonproductive cough. No history of hemoptysis, fever or thrombophlebitis. Bilateral wheezes and rhonchi. Chest X-ray normal. Sent to nuclear medicine with suspected pulmonary embolism. Perfusion lung images showed multiple peripheral defects, many concave and wedge-shaped. The ventilation study showed severe bilateral air trapping, particularly lower lobes, corresponding in distribution to perfusion defects. Studies compatible with alpha-1-antitrypsin deficiency, confirmed by laboratory tests.

For convenient, safe ventilation imaging

**Xenon Xe 133 Gas** (CALIDOSE) Dispensing System

For high-quality perfusion lung imaging

**PULMOLITE™**

Technetium Tc 99m Aggregated Albumin Kit

---

Please see following page for full prescribing information.
Pharmaceuticals

**PULMOLITE™**

Technetium Tc 99m Aggregated Albumin Kit

August 1976

**DIAGNOSTIC—FOR INTRAVENOUS USE**

**DESCRIPTION:** Each vial of PULMOLITE™ Technetium Tc 99m Aggregated Albumin Kit contains a patient, pyrogen-free, lyophilized mixture of 1.66mCi of aggregated albumin (albumin, human-dialyzed, 70% to 90% purity), 70mCi (1.07GBq) of technetium tetroxide (99mTcO₄⁻) intravenous injection solution, and 0.1mg of sodium citrate (0.07% w/v). The albumin solution contains 5.6 mg of detergent (sodium deoxycholate, 0.7% w/v). 

**INDICATIONS:** PULMOLITE™ is a preparation of an aggregated albumin agent intended for intravenous use only. It is composed of albumin, sodium citrate, sodium deoxycholate, polyviynylpyrrolidone and citrate buffer and is administered via the intravenous route for the evaluation of pulmonary function and the localization of pulmonary pathology.

**CONTRAINDICATIONS:** PULMOLITE™ is contraindicated in patients who have shown an allergic reaction to aggregated albumin. The use of aggregated albumin is not recommended for pregnant females.

**PRECAUTIONS:** PULMOLITE™ is contraindicated in patients who have shown an allergic reaction to aggregated albumin. The use of aggregated albumin is not recommended for pregnant females.

**SIDE EFFECTS:**

- Aggregated albumin: Localized reactions at the site of injection have been reported.

**HOW SUPPLIED:** The aggregated albumin kit contains a vial of Technetium Tc 99m Aggregated Albumin and a vial of an intravenous injection solution. The vials are packaged in a box containing 5 of each. Each vial of aggregated albumin contains 1.66mCi of Technetium Tc 99m. Each vial of injection solution contains 70mCi of technetium tetroxide. The injection solution is prepared by mixing the contents of the vials in a volume of sterile physiologic saline solution. The mixture is administered intravenously.

**STORAGE:** Store aggregated albumin kit at room temperature. The injection solution should be prepared immediately before use.

**USAF:** This product is approved by the United States Air Force for use by the military services.

**REFERENCES:**


2. External Radiation
   - The specific gamma ray constant for Tc 99m is 0.8mCi 10⁻⁶s⁻¹. The half-life of the gamma emission is 6.02h. The half-life of the radioactivity is 6.02h. The half-life of the radioactivity is 6.02h. The half-life of the radioactivity is 6.02h.

3. Table 2. Radiation Attenuation by Lead Shielding
   - Shield Thickness (mm) | Attenuation
   - 0.06 | 100%<br> 0.095 | 90%<br> 0.118 | 80%<br> 0.25 | 50%<br> 0.5 | 25%<br> 0.75 | 10%<br> 1.5 | 1%<br>

**Table 3. Table 3. Physical Decay Chart: Tc 99m Half-Life 6.02 Hours
   - Half-life | Hours Remaining | Remaining
   - 6.02 | 0.000 | 100%
   - 5.06 | 0.095 | 90%
   - 4.06 | 0.190 | 80%
   - 3.06 | 0.285 | 50%
   - 2.06 | 0.380 | 25%
   - 1.06 | 0.475 | 10%
   - 0.06 | 0.570 | 1%

**Table 4. Table 4. Physical Decay Chart: Tc 99m Half-Life 6.02 Hours
   - Half-life | Hours Remaining | Remaining
   - 6.02 | 0.000 | 100%
   - 5.06 | 0.095 | 90%
   - 4.06 | 0.190 | 80%
   - 3.06 | 0.285 | 50%
   - 2.06 | 0.380 | 25%
   - 1.06 | 0.475 | 10%
   - 0.06 | 0.570 | 1%

**Table 5. Table 5. Physical Decay Chart: Tc 99m Half-Life 6.02 Hours
   - Half-life | Hours Remaining | Remaining
   - 6.02 | 0.000 | 100%
   - 5.06 | 0.095 | 90%
   - 4.06 | 0.190 | 80%
   - 3.06 | 0.285 | 50%
   - 2.06 | 0.380 | 25%
   - 1.06 | 0.475 | 10%
   - 0.06 | 0.570 | 1%

**REFERENCES:**


2. External Radiation
   - The specific gamma ray constant for Tc 99m is 0.8mCi 10⁻⁶s⁻¹. The half-life of the gamma emission is 6.02h. The half-life of the radioactivity is 6.02h. The half-life of the radioactivity is 6.02h.

3. Table 2. Radiation Attenuation by Lead Shielding
   - Shield Thickness (mm) | Attenuation
   - 0.06 | 100%<br> 0.095 | 90%<br> 0.118 | 80%<br> 0.25 | 50%<br> 0.5 | 25%<br> 0.75 | 10%<br> 1.5 | 1%<br>

**Table 3. Table 3. Physical Decay Chart: Tc 99m Half-Life 6.02 Hours
   - Half-life | Hours Remaining | Remaining
   - 6.02 | 0.000 | 100%
   - 5.06 | 0.095 | 90%
   - 4.06 | 0.190 | 80%
   - 3.06 | 0.285 | 50%
   - 2.06 | 0.380 | 25%
   - 1.06 | 0.475 | 10%
   - 0.06 | 0.570 | 1%

**Table 4. Table 4. Physical Decay Chart: Tc 99m Half-Life 6.02 Hours
   - Half-life | Hours Remaining | Remaining
   - 6.02 | 0.000 | 100%
   - 5.06 | 0.095 | 90%
   - 4.06 | 0.190 | 80%
   - 3.06 | 0.285 | 50%
   - 2.06 | 0.380 | 25%
   - 1.06 | 0.475 | 10%
   - 0.06 | 0.570 | 1%

**Table 5. Table 5. Physical Decay Chart: Tc 99m Half-Life 6.02 Hours
   - Half-life | Hours Remaining | Remaining
   - 6.02 | 0.000 | 100%
   - 5.06 | 0.095 | 90%
   - 4.06 | 0.190 | 80%
   - 3.06 | 0.285 | 50%
   - 2.06 | 0.380 | 25%
   - 1.06 | 0.475 | 10%
   - 0.06 | 0.570 | 1%
Taking a very practical approach, this book presents a readable source of radiation protection material for anyone working in the radiological and health sciences. It is the first suitable text on the subject for students preparing for careers as radiologic and nuclear medicine technologists, for residents, or for medical health physicists. It is an excellent reference guide for anyone using radiation in the health field, including the physician.

The first section, truly unique for the information presented, consists of radiation protection principles which have general application. It includes a discussion of instruments used in the field of radiation protection both for area and personnel monitoring, as well as a description of SI units for radioactivity, exposure, and absorbed dose. The descriptions of the instrumentation used (survey and personnel monitors), are rarely found elsewhere. The sievert is used for dose equivalent and the maximum permissible dose (MPD) is expressed in those terms. The second section concerns itself with protection from sources of internal radiation. An outstanding chapter in this section includes a discussion of the absorbed dose calculation prepared by the Medical Internal Radiation Dose (MIRD) Committee of the Society of Nuclear Medicine. A chapter is also included on the licensing system for production, transportation, possession, and use of radionuclides as regulated by law. The third section is concerned with protection from sources of external radiation and includes both shielding requirements and absorbed dose calculations.

218 pages, 37 illustrations, paperback, $12.50
Published January, 1979, ISBN: 0-8121-0657-1, L.C. No. 78-23698
NUCLEAR MEDICINE RESIDENCY: Two year program in Nuclear Medicine with two positions available. Requirement for admission is completion of prepost-doctoral training as outlined by the American Board of Nuclear Medicine. Positions offered are in associated medical facilities with over 7,000 scans and 11,000 in-vitro studies yearly. This program is dedicated to the clinical aspect of Nuclear Medicine, with emphasis of technologist and a graduate of a nuclear medicine program. Two full-time Nuclear Medicine physicians direct the training, with the assistance of associated physicians, a radiologist, and the personnel of University Hospital. Placement includes six modern gamma cameras and large modern computing facility. Contact: D. R. Spiegelhoff, M.D., Department of Nuclear Medicine, St. Luke’s Hospital, 2900 W. Oakland Avenue, Milwaukee, WI 53215.

CHIEF TECHNOLOGIST, NUCLEAR MEDICINE. Outpatient laboratories and four hospitals (350 beds). San Francisco Bay area. Complex case load with very active nuclear cardiology program required. Good opportunity experience. Send resume and salary requirements to Malcolm R. Powell, M.D., Suite 908, 350 Parnassus Avenue, San Francisco, California 94117.

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.

NUCLEAR MEDICINE TECHNOLOGIST. Full time openings on day shift now available. Excellent opportunity awaits qualified applicant. Excellent starting salary and benefits. Contact the Employment Office, Baptist Medical Center, 3300 N. W. Expressway, Oklahoma City, Oklahoma 73121 405-949-3101.

NUCLEAR PHARMACIST: Applicants should have some radiopharmaceutical education and pharmacy background. We will provide clinical training if necessary. Salary commensurate with experience. Submit resume to: Pharmacists, Inc., 23572 Coolidge Hwy., Oak Park, Mich. 48237, Attention: Personnel.

RESIDENCY POSITIONS AVAILABLE. The Department of Nuclear Medicine at William Beaumont Hospital (Detroit) offers a two-year AMA approved residency in Nuclear Medicine. The 11,000 square foot, modern department is staffed by four full-time board certified Nuclear Medicine physicians, two radiopharmacists, three physicists, one Ph.D. immunologist and ten technicians. Training is highly clinical in orientation, yet the atmosphere is academic with full access to the William Beaumont research facility. Procedures (35,000 per year) are balanced between inpatient and outpatient. The Department also trains eight Nuclear Medicine technicians yearly in its AMA approved programs. For more information and application forms, contact: Howard Dworckin, M.D., Chief, Nuclear Medicine Department, William Beaumont Hospital, Royal Oak MI 48707.


NUCLEAR MEDICINE RESIDENCY—Extensive basic and clinical base of imaging, in-vitro testing, and therapy in combined University Hospital/V.A. Hospital program. Opportunities for clinical and research positions. Write: W. N. Taylor, D. D., Professor of Radiology and Pathology (Nuclear Medicine), University of Alabama Hospitals, Birmingham, AL 35233. An Equal Opportunity/Affirmative Action Employer.

PHYSICIAN, NUCLEAR MEDICINE. State Univ. of New York at Buffalo has two openings at the Assistant/Associate and Chief level. Good experience with B.S. in N. M. Technology Programs. One position as Chief at the Buffalo General Hospital and one as Associate Chief, Hospital of Buffalo. Large central radiopharmacy and research staff. Nuclear Medicine has full departmental status in the Medical School and in the hospital. Excellent Opportunity Employer. Contact Monta Blau, Ph.D., Chairman, Dept. of Nuclear Medicine, 3495 Bailey Ave., Buffalo, NY 14215.

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 ABRN, a strong patient orientation and expertise in all phases of clinical medicine, including in vivo and in vitro techniques, radiopharmaceuticals, diagnostic radiology, and radionuclide therapy. In addition, the Assistant Chief, Nuclear Medicine Service will have specific responsibilities in radiation education and supervision. Applications from all qualified candidates are welcome. Send resume and an autobiographical letter, should be sent to: Rex B. Shaver, M.D., Chief, Nuclear Medicine Service (115), Veterans Administration Medical Center, 34th Street, and 48th Avenue South, Minneapolis, MN 55417. An Equal Opportunity Employer.

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 preference to BMF, Attn. Chief Care Division, P.O. Box 6437, Columbus, OH. 43292, (603) 787-8710.

SUPERVISOR, NUCLEAR MEDICINE. Excellent opportunity available for registered Nuclear Medicine Technologist with previous experience. Pleasant working conditions at progressive 319-bed general hospital in suburban Denver, just minutes from the mountains. Salary negotiable. Excellent benefits. Please send resume to: Mrs. L. Pattin, Personnel, Swedish Medical Center, 501 E. Hampden, Englewood, Colo. 80110.

NUCLEAR MEDICINE PHYSICIAN needed to share clinical and teaching responsibilities at the Columbia-Presbyterian Medical Center. Should be board eligible or certified in Medicine or Nuclear Radiology. Special Competence in Nuclear Cardiology desirable. An Affirmative Action Equal Opportunity employer. Send resume to: Nuclear Medicine, The Presbyterian Hospital, 622 West 168 Street, New York, New York 10032.

REGISTERED NUCLEAR MEDICINE TECHNOLOGIST needed for 200-bed acute general hospital. Desire experience in cardiac imaging and computations and general nuclear medicine, including fringe benefits. Major expansion program presently underway, scheduled for completion early 1980. Contact for further information: Personnel Department, Billings Deaconess Hospital, P.O. Box 2547, Billings, Montana 59103. (406) 657-4013. An Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST. Needed for a rapidly expanding X-ray department in a progressive acute care hospital. Experience with Mobile Ohio Nuclear Sigma 420 and Ohio Nuclear VIP 450 is desired. Competitive salary and excellent fringe benefits. Reno is located in the heart of the Sierras, thirty miles from Lake Tahoe offering unlimited outdoor recreation such as skiing and backpacking, and excellent cultural events. Reno is located in the heart of the Sierras, thirty miles from Lake Tahoe offering unlimited outdoor recreation such as skiing and backpacking, and excellent cultural events. Reno is located in the heart of the Sierras, thirty miles from Lake Tahoe offering unlimited outdoor recreation such as skiing and backpacking, and excellent cultural events.

POSTDOCTORAL FELLOW to work in area of 3-dimensional nuclear medicine imaging and instrumentation with special emphasis on cardiac applications. Must be citizen, noncitizen national, or admitted for permanent U.S. residency. Position available 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. Non-discriminatory/Affirmative action employer.

CERTIFIED NUCLEAR MEDICINE TECHNOLOGIST needed for busy Cardiology Department to work with Multi-Crystal Gamma Camera, to help in the development of Nuclear Medicine Department of Nuclear Cardiology. Possible opportunities in Clinical Research and Teaching. Address all inquiries to E. Enriquez Leguizamon, M.D., E. McLaughlin Street, Suite 106, Kalamazoo, Michigan, 49001.

NUCLEAR PHYSICIAN. The University of Missouri-Columbia is seeking a board certified or board eligible nuclear physician for July 1, 1979. The successful candidate will fill staff position with imaging and in vitro responsibilities. Background in internal medicine, radiology or pathology is acceptable. Candidates must be prepared to accept full clinical duties and teaching responsibilities. There is ample opportunity for research. Contact: R. Halbusch, M.D., Chief of Nuclear Medicine, Department of Radiology, University Medical Center, 807 Stadium Road, Columbia, Mo. 65212, Tel (314) 882-2541. An Equal Opportunity Employer.

A two year training program in nuclear medicine leading to certification by the American Board of Nuclear Medicine or one year residency leading to certification in nuclear radiology by the American Board of Radiology is offered to group. To be considered for a fully integrated program offered by Vanderbilt University Hospital and the Veterans’ Administrations Hospital in Nashville, Tennessee, candidates must be certified nuclear medicine physicians and eight full-time nuclear medicine Ph.D. participate in the didactic as well as the clinical experience. Program includes three large field scintillation cameras, three small field scintillation cameras, the Proton tomographic scanner, the 1980 digital scanner, the 1980 fluoroscopic 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 postmortem examinations for children and adults.
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 immunohistochemistry 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.

NUCLEAR MEDICINE TECHNOLOGIST. Immediate opening for full time staff technologist in a new primary teaching hospital for School of Medicine. Modern, well-equipped department, competitive salaries, excellent benefit package. Must be registered or registry eligible, must have experience in Nuclear Medicine. Contact: Personnel Department, Health Sciences Center Hospital, P.O. Box 5980, Lubbock, TX 79417. An Equal Opportunity Employer.

PHYSICIAN, NUCLEAR MEDICINE. Opening for staff physician on July 1, 1979 in new university affiliated 460 bed VA Medical Center. Existing full-time staff includes Ph.D. level radiochemist and physicist. Candidate must have well defined research interest and capability and will be expected to carry on active clinical or basic investigative program in addition to sharing teaching and clinical responsibilities. Board certification preferred. Salary based on training and experience. Contact: Norman Poe, M.D., Nuclear Medicine Service, Jerry L. Pettis Memorial Veterans Medical Center, Loma Linda, CA 92357. (714) 825-7084. Ext. 2669. AN EQUAL OPPORTUNITY EMPLOYER.

POSITIONS WANTED

NUCLEAR PHYSICIAN/THERAPEUTIC RADIATION. Board certified in Radiation Therapy; Eligible ABNM; Nuclear cardiology and RIA experience; Available 7/1/79. Reply: Box 202, Society of Nuclear Medicine, 475 Park Avenue South, New York, N.Y. 10016.


TECHNOLOGISTS AVAILABLE. Graduates of the SUNY/Buffalo B.S. in N.M.T. Program will be available for placement in June 1979. The program prepares generalists through comprehensive basic science and clinical training in both imaging and RIA. Contact Ann Stevens, N.M.T. Program Coordinator, 3495 Bailey Ave., Buffalo, NY 14215 (716-838-5889) or Jehuda Steinbach, M.D., Chief, Nuclear Medicine Service, Veterans Administration Medical Center, 3495 Bailey Ave., Buffalo, NY 14215 (716-834-9200 EXT. 340).

University based nuclear radiologist(s) seeks part-time nuclear medicine position in northern New Jersey. Reply Box 300, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

CHIEF NUCLEAR MEDICINE TECHNOLOGIST, ARRT, graduate AMA approved school. Recent Master's Degree, physics concentration. Teaching experience army medical corps veteran. Desire educational co-ordinator/instructor position with progressive institution, pleasant working conditions. Weekends (717) 645-5955.

Where there is HOPE... there is life.

Give to:

PROJECT HOPE

Department A, Washington, D.C. 20007

Volume 20, Number 3

75A
New, from Nuclear Instrument Service & Engineering, comes...\n
NISE, NISER, NISEST
3 NISE WAYS TO GO!

The most practical, economical and reliable way to make consistent high quality hard copies on X-Ray film.

NISE, Inc.
NUCLEAR INSTRUMENT SERVICE & ENGINEERING

Schaap, Veenderhoudt, C.V.
SCHAAP, SCHAAPSTREEK
SWEDEN (TEL. 08/758-98-98)

Schaap and West Germany
SCHAAP, SCHAAPSTREEK
NETHERLANDS (TEL. 06/909-1200)

Japan
KYORITSU MEDICAL ELECTRIC CO. LTD.
31-13 MOTOYODOSHI-MACHI
SHIBUYA-KU, TOKYO 151
JAPAN (TEL. 305-688-2324)

U.S.A., all other countries and O.E.M.
NINE INC.
20TH STATE ROAD
CERPTON, CALIFORNIA 90701
U.S.A. (TEL. 213-960-6788)

FLORIDA

Nuclear Chemistry Supervisor and Medical Technologist for RIA laboratory. Supervisor must have 5 years experience and nuclear chemistry procedures with MT (ASCP) or eligible. Technologist must have 2 years experience with MT (ASCP) or eligible. We are a 280 bed non-profit hospital located in the PALM BEACHES. Excellent salary and benefit package. Call collect or direct resume to: Employment Manager, JFK MEMORIAL HOSPITAL, P.O. Box 1489, Lake Worth, FL 33460, (305) 965-7300. Ext. 3230.

Equal Opportunity Employer

RAIOPHARMACIST

We require a self-motivated pharmacist who can develop and promote programmes provided to our Nuclear Medicine Department as well as provide an efficient day-to-day service.

The position is in a large progressive Pharmacy Department of an 1100 bed teaching hospital. The incumbent will participate in both Pharmacy and Nuclear Medicine Teaching and Research programmes.

Applicants must have a related postgraduate degree preferably supplemented by residency training and recent experience.

Send resumes to: Personnel Officer, Sunnybrook Medical Centre, 2075 Bayview Avenue, Toronto, Ontario, Canada M4N 3M5

LOYOLA UNIVERSITY MEDICAL CENTER
MAYWOOD, ILLINOIS

POSITION AVAILABLE IMMEDIATELY

- Registered Nuclear Medical Technician
- Preferably with computer experience
- Interested in research
- To operate new clinical laboratory for measuring regional cerebral blood flow, using the 133Xenon method
- West Suburban Chicago location
- Pleasant working conditions, newly equipped facilities
- Most current data processing system available, including: Meditronic Inhalation Cerebrograph, and Hewlett Packard 9845 Data Processing Sys.
- Competitive salary and benefits
- Rapidly growing University Medical Center

Please contact Dr. O. Howard Reichman, Professor and Chief, Division of Neurological Surgery, Loyola University Medical Center, 2160 S. First Avenue, Maywood, Illinois 60153. To interview, please phone: (312) 531-3207.
NUCLEAR MEDICINE/ULTRASOUND TECHNOLOGIST

Immediate full-time position available for experienced technologist with dual capability: Nuclear Medicine and Ultrasound. This challenging position is compensated with an excellent salary, benefits, and a working environment in sunny Southern California.

Contact:
A. Hernandez or J. Larson, Div. Mgrs.
Nuclear Medico Services, Inc.
P. O. Box 7689
Van Nuys, CA 91409
(213) 988-7750

RESIDENCY
Two-year approved program offering broad clinical experience including tertiary care and community hospitals, oncology and pediatrics. Ultrasound and CT. Strong basic science teaching, radiation safety, central radiopharmacy and RIA. Opportunity for research.
An intergrated program at State University of New York at Buffalo School of Medicine. Available July 1, 1979. Contact: M.A. Bender, M.D., Program Director, Dept. of Nuclear Medicine, 666 Elm Street, Buffalo, NY 14263 or M. Blau, Ph.D., Chairman, Dept. of Nuclear, 3495 Bailey Avenue, Buffalo, NY 14215.

Cost-saving Innovation for the Hospital Pharmacy

For consistent, accurate delivery of I.V. Additive dosages into the following pharmaceutical containers:
- sterile filled intermittent dose bottles (reconstitution)
- sterile injectable syringes
- liquid oral dose syringes
- partially filled Mini Bag Underfill Viaflex® containers

Advantages
- Extends versatility of Wheaton Unispense automatic dispenser to include packaging of I.V. Additives
- Each tubing assembly individually packaged and pre-sterilized. Disposable. Prevents cross-contamination of drugs
- Adapts to standard I.V. administration sets with vented spikes
- Positive locking of syringe needle within outlet connection
- Minimizes number of perforations through septum of container
- Compact size for use under sterile hood
Send for complete information.

NUCLEAR MEDICINE PHYSICIAN

Nuclear Medicine Physician urgently needed for 450-bed teaching hospital in northern New Jersey. Extremely active department with large computer and busy general nuclear medicine and nuclear cardiology practice. If interested, please respond giving background experience and salary requirements. A general medicine background is preferred, but not absolutely required. Ultrasound experience desirable. Reply to:

Martin F. Sturman, MD
Director of Nuclear Medicine
St. Michaels Medical Center
268 High Street, Newark, NJ 07102

![Wheaton I.V. Additive Pump Chamber Assembly](image)
SNM Annual Meeting 1979: A Preview

The SNM 26th Annual Meeting will be held from June 26-29, 1979 at the Georgia World Congress Center in Atlanta. Two pre-meeting courses will be given on Monday, June 25.

MEETING AT A GLANCE

JUNE 25
- Continuing Education courses (at the Hyatt Regency Atlanta)
  *Cardiovascular Nuclear Medicine
  *Bone Imaging: A Clinical Practicum
- Ice-Breaker Cocktail Party at the Congress Center

JUNE 26
- Formal opening of meeting
- Scientific sessions begin

JUNE 27
- Board of Trustees Meeting (open to entire SNM membership)
- Continuing Education sessions
- SNM Business Meeting

JUNE 28
- Scientific sessions

JUNE 29
- Scientific sessions

*Pre-registration for the meeting and the pre-meeting courses is recommended. (There will be a separate registration fee for the pre-meeting courses. As the two pre-meeting courses will be given simultaneously, only one may be taken.)

NEW SNM AUDIOVISUALS AVAILABLE NOW

The most recent additions to the Society of Nuclear Medicine's audiovisual instruction program are:

SI-14 Radiopharmaceuticals for Tumor and Adrenal Scanning: Samuel Halpern
SI-15 Scintillation Cameras: Bryan Westerman
SI-18 Basic Concepts in Cardiac Anatomy and Physiology: Glen W. Hamilton
SI-21 Perfusion Studies of the Ischemic Heart: Glen W. Hamilton
SI-22 Detection of Acute Myocardial Infarction: B. Leonard Holman
SI-23 Instrumentation for Nuclear Cardiology: Trevor D. Craddock
SI-24 Your Nuclear Medicine Examination: An Audiovisual for Patients (*)

Please send me:

_____ SI-14  _____ SI-22
_____ SI-15  _____ SI-23
_____ SI-18  _____ SI-24
_____ SI-21

Send my order to:

________________________________________________________________________
________________________________________________________________________

COSTS FOR EACH UNIT (except SI-24):
$55.00 for members of SNM
$75.00 for nonmembers

COSTS FOR SI-24:
$65.00 for members
$85.00 for nonmembers
SI-24 also available in 3/4 inch videocassette
$85.00 for members
$110.00 for nonmembers

All orders must be accompanied by check or purchase order. Make checks payable to the Society of Nuclear Medicine, Inc. Costs given include handling and mailing in the United States.
Megaloblastic Anaemia?

Our B₁₂ and Folate kits leave others on the shelf

Our new Vitamin B₁₂ Radioassay kit
combines six important features which give you the advantage over other radioassay and bioassay methods.
- Robust and reliable assay—unaffected by antibiotics.
- Uses liquid reagents, reducing the risk of contamination and maximising convenience.
- Clinical data available on both normal and abnormal patients.
- Rapid assay—only four pipetting steps, results available within 3 hours.
- Fast counting time with the use of the highest specific activity [⁵⁷ Co]cyanocobalamin.
- Similar protocol to our folate kit simplifies operator handling.

New Vitamin B₁₂ and Folate Radioassay kits.

Our established Folate Radioassay kit,
like our new B₁₂ kit, is manufactured to the highest standards. The kit is equally adaptable for both serum and red cell folate and is backed by clinical data. Results are obtainable within 3 hours. The assay is unaffected by antibiotics and utilizes our unique ⁷⁵Se-labelled folate derivative for easy gamma counting.

Further information is available on request.
In the Americas: Amersham Corp., Illinois 60060. Telephone: 312-593-8500.
Computers are here to stay in instrumentation for Nuclear Medicine image processing. And to maintain your department with state-of-the-art instrumentation, you need to understand digital image processing techniques.

You can learn about computers by rummaging through current literature on instrumentation or by evaluating clinical papers utilizing computer systems. But that's time consuming and inconvenient.

You can rely on the commercial manufacturers of computer systems for your comprehension of their instrumentation. But can you really be confident that the information is complete and objective?

Or, you can make use of a training package designed specifically for the newcomer to Nuclear Medicine image processing. Complete with audio-visuals, our orientation introduces computers, terminology, basic concepts in image processing, and the latest Nuclear Cardiology techniques.

We are not associated with any commercial manufacturer of computer systems. Our goal is to educate you on digital processing techniques so that you can ask intelligent questions about computer systems.

Our programs are shipped complete with audio-visual materials (videotape or 35mm slide/cassette), instructor's guide with course outline and examination, and the COMPUTER METHODS textbook published by the C. V. Mosby Company, St. Louis, MO.

To order programs or literature, fill in the form below and return it to COMPUTER METHODS.

<table>
<thead>
<tr>
<th>COMPUTER METHODS Kit.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Videotape . . . . . . .</td>
<td>$450.00</td>
</tr>
<tr>
<td>35 mm Slide/Cassette</td>
<td>96.00</td>
</tr>
<tr>
<td>30 Day Rental Plan:</td>
<td></td>
</tr>
<tr>
<td>Videotape . . . . . . .</td>
<td>$95.00</td>
</tr>
</tbody>
</table>

**Tape Format:**
- [ ] 3/4" "U-Matic"
- [ ] 1/2" "Beta Max"
- [ ] 1/2" VHS

**COMPUTER METHODS SUPPLEMENTS**

P.O. Box 7398 • Ann Arbor • Michigan 48107

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Institution</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Zip</td>
<td></td>
</tr>
</tbody>
</table>
The Heart —
An advance from Mallinckrodt provides an excellent adjunct in the detection of myocardial infarction and the dynamic assessment of cardiac function.

TechneScan® PYP™ Kit (Stannous Pyrophosphate) for preparation of Technetium Tc-99m Stannous Pyrophosphate.

A consistent agent for skeletal imaging, TechneScan PYP is now available for use as an adjunct in the diagnosis of acute myocardial infarction, and for gated cardiac blood-pool imaging. Investigators have found the technetium-99m pyrophosphate scintigraphic study to be a highly useful diagnostic technique for evaluating chest pain of uncertain origin.1

"The gated cardiac blood pool scan permits the calculation of both ejection and regional wall motion from a single examination."2

Mallinckrodt’s TechneScan PYP...a preferred way to detect acute myocardial infarction...an advanced method to dynamically assess cardiac function.

References:

Mallinckrodt, Inc.
P.O. Box 5840, St. Louis, Missouri 63134
See reverse side for brief summary of complete prescribing information.
An advance from Mallinckrodt provides an excellent adjunct in the detection of myocardial infarction and the dynamic assessment of cardiac function.

TechneScan® PYP™ Kit (Stannous Pyrophosphate) for preparation of Technetium Tc-99m Stannous Pyrophosphate.

BRIEF SUMMARY

CLINICAL PHARMACOLOGY

When injected intravenously TechneScan PYP Tc 99m has a specific affinity for areas of altered or false negatives. It is also concentrated in the injured myocardium, primarily in areas of irreversibly damaged myocardial cells.

One to two hours after intravenous injection of TechneScan PYP Tc 99m, an estimated 40 to 70 percent of the injected dose has been taken up by the skeleton and approximately 0.01 to 0.02 percent per gram of acutely infarcted myocardium. Within a period of one hour, 10 to 11 percent remains in the vascular system, declining to approximately 2 to 3 percent twenty-four hours post injection. The average urinary excretion was observed to be about 40 percent of the administered dose after 24 hours.

TechneScan PYP also has an affinity for red blood cells. When administered 30 minutes prior to the intravenous administration of sodium pertechnetate Tc 99m approximately 76 percent of the injected activity remains in the blood pool providing excellent images of the cardiac chambers.

INDICATIONS AND USAGE

TechneScan PYP Tc 99m is a skeletal imaging agent used to demonstrate areas of altered osteogenesis, and a cardiac imaging agent used as an adjunct in the diagnosis of acute myocardial infarction.

As an adjunct in the diagnosis of confirmed myocardial infarction (ECG and serum enzymes positive), the incidence of false positive images has been found to be 5 percent. False negative images can also occur if made too early in the evolution phase of the infarct or too late in the resolution phase. In a limited study involving 22 patients in whom the ECG was positive and serum enzymes questionable or negative, but in whom the final diagnosis of acute myocardial infarction was made, the incidence of false negative images was 23 percent. The incidence of false positive images has been found to be 7 to 9 percent. False positive images have also been reported following coronary by-pass graft surgery, in unstable angina pectoris, old myocardial infarcts and in cardiac contusions.

TechneScan PYP is a blood pool imaging agent which may be used for gated cardiac blood pool imaging. When administered intravenously 30 minutes prior to the intravenous administration of sodium pertechnetate Tc 99m approximately 76 percent of the injected activity remains in the blood pool.

CONTRAINDICATIONS

None.

WARNINGS

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

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

Warning: Preliminary reports indicate impairment of brain scans using pertechnetate Tc 99m which have been preceded by bone scan. The impairment may result in false positives or false negatives. It is recommended, where feasible, that brain scans precede bone imaging procedures.

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

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

The contents of the TechneScan PYP reaction vial are intended for use in the preparation of Technetium Tc 99m Stannous Pyrophosphate. TechneScan PYP may also be reconstituted with sterile, pyrogen-free normal saline containing no preservatives and injected intravenously prior to the administration of sodium pertechnetate Tc 99m.

Sodium pertechnetate Tc 99m solutions containing an oxidizing agent are not suitable for use with the TechneScan PYP Kit.

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

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

PRECAUTIONS

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

Bone Imaging

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

Cardiac Imaging

Patient's cardiac condition should be stable before beginning the cardiac imaging procedure. If not contraindicated by the cardiac status, patients should be encouraged to ingest fluids and to void frequently in order to reduce unnecessary radiation exposure.

Interference from chest wall lesions such as breast tumors and healing rib fractures can be minimized by employing the three recommended projections.

Blood Pool Imaging

TechneScan PYP should be injected by direct venipuncture. Heparinized catheter systems should be avoided.

ADVERSE REACTIONS

None.

HOW SUPPLIED

Catalog Number—094 TechneScan PYP Kit

Kit Contains:

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

Reaction Vial Contains:

12.0 mg sodium pyrophosphate and 3.4 mg stannous chloride (lyophilized).

Hydrochloric acid is added for pH adjustment prior to lyophilization.

5—Radioassay Information String Tags.

Mallinckrodt, Inc.

P.O. Box 5840, St. Louis, Missouri 63134
Does Your Xenon Trap Still TRAP XENON?

The New Xenalarm will monitor it

All activated charcoal packs will eventually fail. The name xenon trap is actually a misnomer, xenon delay system is much more descriptive. When it will fail depends on many variables. When it fails, you need to know. That is what the Xenalarm was designed to do. It will give you an audio/visual alarm when the concentration of Xenon-133 in the exhaust port exceeds $1 \times 10^{-2}$ uCi/ml. It can be added to any manufacturer's xenon trap.

IT SHOULD BE ADDED TO ALL MANUFACTURERS' XENON TRAPS (Except the Radx Model 120 Xenon Trap, which has the alarm already built-in.)

For a demonstration, please call or write

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

(1) Timpe, G. M. Precautions for Avoiding $^{133}$Xe Release From Charcoal Xenon Traps. Journal of Nuclear Medicine Technology Volume 4, Number 4, Pages 208-209.
Clean up image uniformity without covering up clinical information.

If you're now using a Picker Dyna® 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™ Processor, you now get unequaled 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 certainty. 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.
Remember!

Ours is a freeze-dried DTPA that does not require refrigeration and is ready for addition of Tc99m solution. Made with monocalcium trisodium salt, rather than pentasodium salt.

Available in a six pack, each of the six vials contains a sterile, pyrogen-free mixture of 20.6 mg of CaNa₃ diethylenetriaminepenta acetate, 0.210 mg of stannous chloride and HCl and/or NaOH to adjust pH.

Your order is processed on the same day as received. Ask about quantity discounts available on all our kits.
Help your cardiologist study heart kinetics non-invasively with Brattle-gated scintiphotos.

The RAO view shows akinesis of the lower antero-lateral wall and apex; and contraction of the inferior wall and high up the antero-lateral wall. The LAO view shows good contraction posteriorly and akinesis of the septal aspect of the chamber. Patient was injected IV with 20mCi of 99mTc-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 because we stay right with him. Brattles contain an ECG to track heart, a plethysmograph to track respiration, and a tiny computer to deduce systole and diastole times from the heart signal. And because it's all built in, your operator need not be a physiologist.

We don't cover our tracks—
we print them
The panel lights flash whenever the patient reaches the selected phases; and pushing the RECORDER-ON button gets you an ECG tracing marked with breathing and camera-on times. You can verify function before, during and after exposure.

A single pair of axillary electrodes captures both heart and breath
It's easy. And we supply disposable, pre-filled electrodes.

Some Brattles have been in clinical use for over 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
When the subject can't be moved, it helps to have a camera that can.

With the introduction of lighter photographic cameras that enabled man to seek new perspectives from which to take pictures, new horizons in realism were made possible. Searle Radiographics similarly influences technology in the field of nuclear medicine with its extensive line of systems that extend the clinical utility of nuclear cardiology throughout the hospital.

The Scintistore™ Time-compression Data Storage/Retrieval System.
The Gamma/Cor™ RCG Cardiac Probe.
The Scintiview™ Image Control Station.

Versatility and great images. They're the reasons why this is the most complete and efficient nuclear cardiology line available. Find out how our product technology can serve your needs in nuclear cardiology by contacting Searle Radiographics.