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- 20 Sizes—from 830mCi to 16,600mCi.
- 3 Calibration Days—Monday, Tuesday and Thursday.
- Open/Closed Valve—to eliminate possibility of leakage during shipment
- Secondary Shield—can be loaded from top or from side.

#### Easy-to-Use

- Horizontal elution
- Internal saline reservoir—lets you automatically elute, eliminating the need to store
- 5, 10 and 20cc vials allow you maximum flexibility in elution concentration to meet your needs.

#### **Maximum Radiation Protection**

The smallest 5 sizes of the Technetium Tc 99m Generator—830, 1660, 2480, 3310 and 4140mCi—are shielded with lead. The remaining fifteen sizes are shielded with depleted uranium internal shielding. Depleted uranium possesses greater density and therefore offers superior shielding properties for our higher activity Generators. Optimum shielding design minimizes radiation to personnel in work areas, providing maximum protection.



4050 Lakeside Drive, P.O. Box 6950, Richmond, CA 94086

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#### **TECHNETIUM Tc 99m GENERATOR for the Production** of Sodium Pertechnetate Tc 99m

DESCRIPTION: The Technetium To 99m Generator is prepared with fission produced Molybdenum We shall be considered to the control of the contro 99 on the generator column

Each eluate of the generator sho uld not contain more than 0.15 microcurie of the Mo 99 per millicurie Technetium Tc 99m per administered dose at the time of administration, and not more than 10 micrograms of aluminum per milliliter of the generator eluste, both of which must be determined by the user before administration.

Since the eluate does not contain an antimicrobial agent, it should not be used after twelve hours from the time of generator elution

INDICATIONS AND USAGE: Sodium Pertechnetate Tc 99m is used IM ADULTS as an agent for: brain imaging including cerebral radionuclide angiography; thyroid imaging; salivary gland imaging; placerta localization; blood pool imaging including radionuclide angiography; and urinary bladder imaging (direct isotopic cystography) for detection of vesico-ureteral reflux.

Sodium Pertechnetate Tc 99m is used IN CHILDREN as an agent for: brain imaging including cerebral radionuclide angiography; thyroid imaging; blood pool imaging including radionuclide angiography; and urinary bladder imaging (direct isotopic cystography) for the detection of welcounterable radionuclide.

WARMINGS: Radiation risks associated with the use of Sodium Pertechnetate Tc 99m are greater in children than in adults. In general, the younger the child the greater the risk owing to greater absorbed radiation doses and longer life expectancy. These greater risks should be taken firmly into account in all benefit-risk assessments involving childre

PRECAUTIONS: 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 occupational workers.

Since the eluate does not contain an antimicrobial agent, it should not be used after twelve hours from the time of generator elution

Carcinogenesis, Mutagenesis, Impairment of Fertility
No long-term animal studies have been performed to evaluate carcinogenic potential or whether
Technetium Tc 99m may affect fertility in males or females.

Pregnancy Category C nimal reproductive studies have not been conducted with Technetium Tc 99m. It is also not immal reproductive stories are some cause fetal harm when administered to a pregnant w r can affect reproductive capacity. Technetium Tc 99m should be given to a pregnant woman the expected benefits to be gained clearly outweigh the potential hazards. if the expected be

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

Nursing Mothers
Technetium Tc 99m is excreted in human milk during lactation, and therefore formula feedings should be substituted for breast feedings.

Pediatric Use
See IMDICATIONS AND USAGE, DOZAGE AND ADMINISTRATION. See also description of additional risk under WARN

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

The generator should not be used after 16 days from the date and time of calibration

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

ADVERSE REACTIONS: Allergic reactions including anaphylaxis have been reported infrequently following the administration of Sodium Pertechnetate Tc 99m.

HOW SUPPLIED: Sodium Pertschnetzte Tc 99m is supplied as a Molybdenum Mo 99/Technetium Tc 99m generator in sizes from 830 millicuries up to 16,600 millicuries (in approximately 830 millicurie increments) of Molybdenum Mo 99 as of 10:00 P.M. Eastern Time of the day of calibration. The TECHNETIUM Tc 99m GENERATOR consists of:

1) sterile generator, 2) Sodium Chloride injection source, 3) 10 cc sterile evacuated vials, 4) sterile needles, 5) elution vial shield \* 6) finished drug labels. Elution vials in 5 cc and 20 cc sizes are available upon request.

Initial order only

The TECHNETIUM To 99m GENERATOR should not be used after sixteen (16) days from the date

For multidose use, the sluste should be used within 12 hours of the generator elution time. If the eluste is used to reconstitute a kit, the radiotabeted kit should not be used after 12 hours from the time of generator elution or 6 hours after reconstitution of the kit, whichever is earlier.

CINTICHEM INC., Tuxedo, N.Y. 10987 SUBSIDIARY OF MEDI-PHYSICS, INC.

**APRII 1985** 

## New Dynamic Cardiac Phantom Outperforms the Field!

DYNAMIC CARDIAC PHANTOM

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Offers the Most Versatility\*
for Quality Control in
Acquiring and Processing
Gated Radionuclide
Ventriculograms (GRNV)

- Provides excellent simulation of left and right ventricle wall motion and volume changes, with constant background activity, to test gated radionuclide ventriculography hardware and software.
- Allows acceptance and QA testing for data acquisition instruments, data processing software, and overall cardiac systems.
- Renders realistic radionuclide ventriculogram and cardiac volume trace.
- Has adjustable heart rate and ejection fraction levels.
- ■Easy to load and operate; an excellent training aid for all nuclear cardiology personnel.
- \* An article comparing our new Dynamic Cardiac Phantom with other commercially available phantoms appears in the March 1985 issue of JOURNAL OF NUCLEAR MEDICINE TECHNOLOGY, Vol. 13, No. 1, Pgs. 5-9. In the article, "The Use of Phantoms for Quality Control in Gated Cardiac Studies", the authors, Busemann-Sokole and Cradduck, state that our cardiac phantom "produces a good simulation of left and right ventricular wall motion and stroke volume changes, and constant overlying background activity", and "offers the most versatility for routine quality control of the overall system". Copy of article available on request.

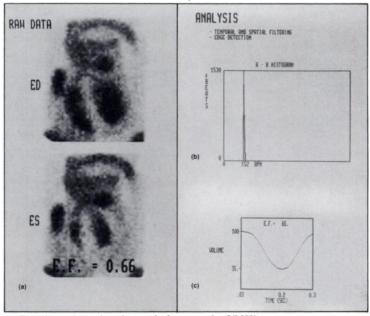
For more information, request Bulletin 368-B

#### **NUCLEAR ASSOCIATES**

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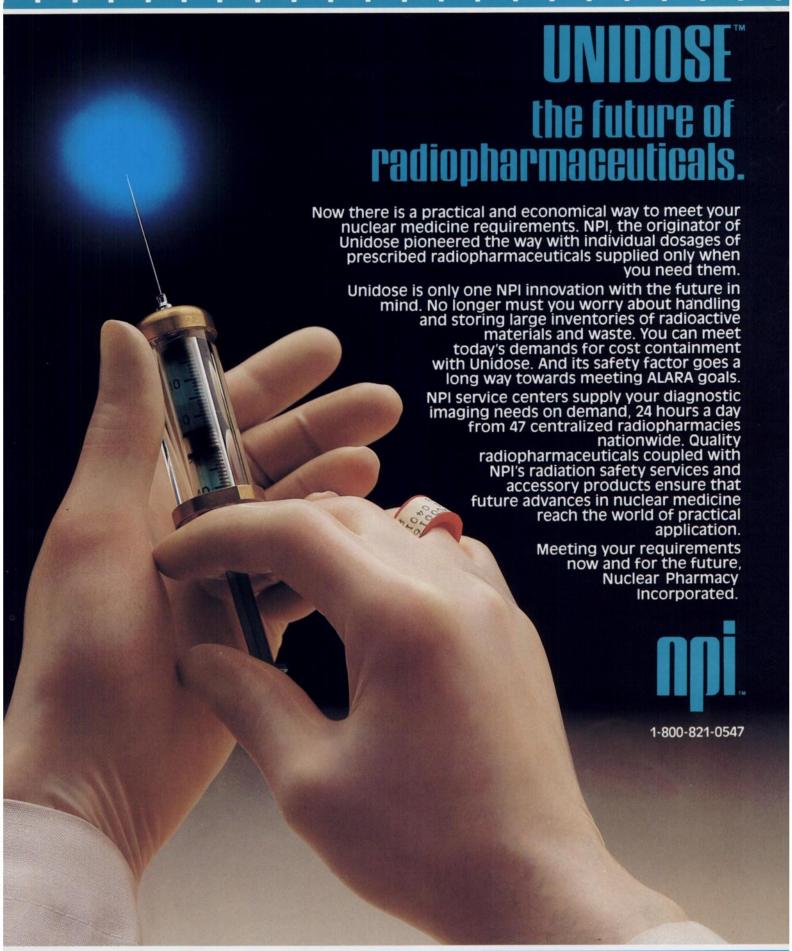
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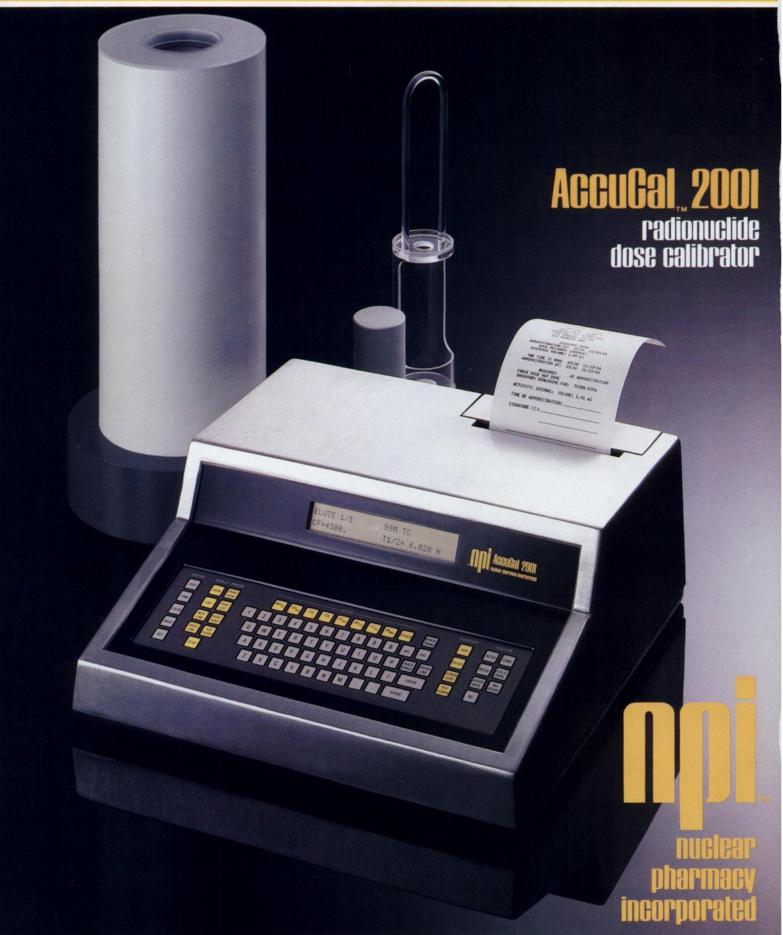
Typical data from operation of the Dynamic Cardiac Phantom:

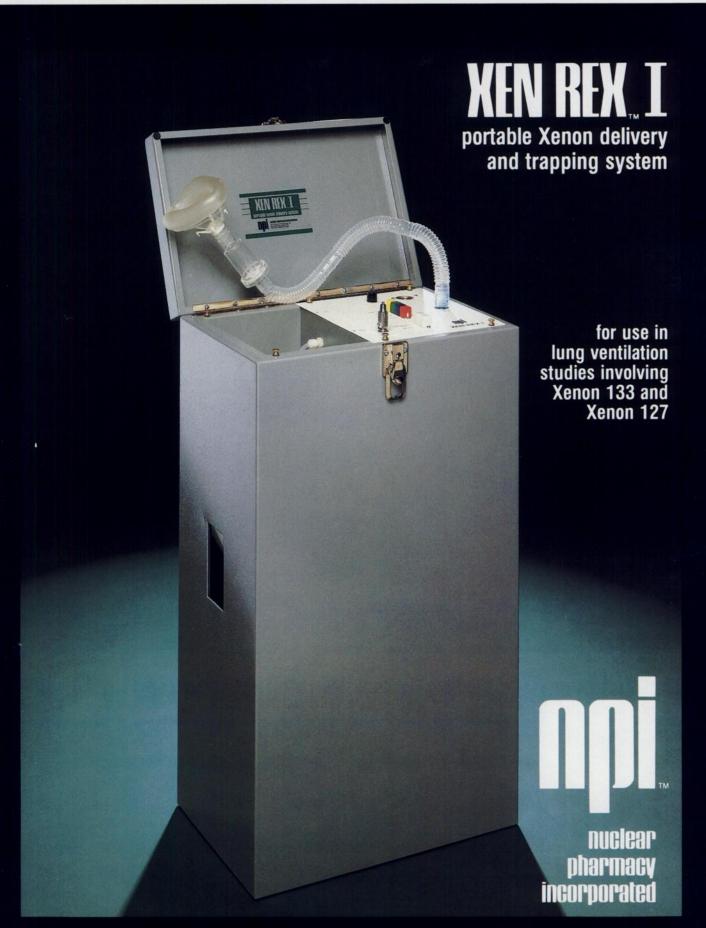


- (a) End diastole and end systole frames of a GRNV series.
- (b) Histogram of R-R time period showing temporal stability.
- (c) Cardiac volume graph from phantom operation.

Circle Reader Service No. 2









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#### CENTOCOR ANTIMYOSIN CARDIAC IMAGING AGENT

## Myoscint may enhance diagnosis, assessment of myocardial infarction

The imaging techniques currently used to evaluate myocardial infarction (MI) have a major drawback: They do not permit differentiation between cardiac necrosis and ischemia in the early hours following infarction.

Thallium-201, for example, concentrates only in normal myocardial cells. The bone scanning agent <sup>99m</sup>Tc-pyrophosphate, on the other hand, is taken up by the ribs as well as by all ischemic cells.

These agents are therefore of little use for differentiating between irreversible necrosis and severe ischemia. Yet the ability to make that distinction—and to make it quickly—could significantly improve management of cardiac patients.

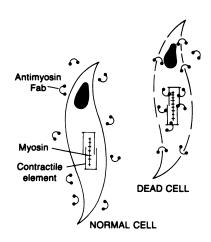
Myoscint,<sup>TM</sup> an imaging agent based on a monoclonal antibody specific to cardiac myosin, may fill this void in cardiac imaging technology.

Because this MAb binds solely to the intracellular myosin that is exposed on cell death, Myoscint concentrates only in necrotic cells (see diagram). It therefore permits precise localization of unsalvageable tissue.

#### Improved MI diagnosis may also result

In addition, Myoscint may permit MI detection and localization in areas of the heart that may otherwise be difficult to interpret.

A recent case demonstrates this capability. A 57-year-old male presented with diffuse chest pain. Although neither ECG nor echocar-diographic examination revealed abnormalities, an elevated CPK indicated a need for further study.

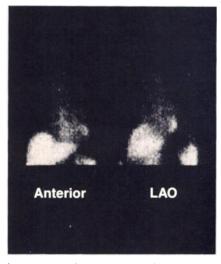


Because it binds exclusively to intracellular myosin—a globulin exposed only upon cell death—Myoscint has demonstrated unprecedented utility for differentiating between cardiac necrosis and ischemia.

Twenty-four hours after being injected with Indium 111-labeled Myoscint DTPA, the patient underwent a nuclear scan. The resulting images clearly demonstrated necrotic tissue in the postero-lateral region, confirming the diagnosis of MI (see images).

#### Myoscint may be useful for nuclear and MR imaging

Myoscint is being evaluated extensively in conjunction with traditional imaging techniques, including early thallium-201 distribution, early and late wall motion cineventriculography, and gated blood pool scanning. This research continues to verify its ef-



Images acquired 24 hours after injection of Indium 111-labeled Myoscint DTPA reveal postero-lateral MI. ECG and echocardiographic studies had failed to detect the infarction.

ficacy for identifying zones of acute myocardial necrosis.

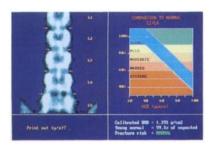
In addition, paramagnetic-labeled Myoscint is undergoing investigation to evaluate its utility in magnetic resonance studies. Results to date indicate that it may indeed be an effective tool for cardiac assessment in the MR suite.

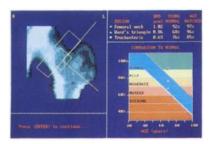
#### Available for research use

Myoscint is now available FOR RESEARCH USE ONLY. If you would like more information on this product, or other biotechnological products under development at Centocor, please call us, toll free.



### LUNAR DP3-XT/AT, The Unique Clinical Solution For Bone Densitometry





Over a decade of research and clinical testing has gone into the LUNAR DP3 dual-photon spine/femur scanners. LUNAR scientists pioneered both single and dual-photon absorptiometry and helped LUNAR become the world's largest manufacturer of bone measurement instrumentation.

LUNAR now offers the IBM-XT and AT\* as options to our acclaimed DP3 scanner. Advanced features of the DP3-XT/AT include:

- -Multi-tasking
- -Automated peaking
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- -Hard-disk storage

LUNAR continues to set the standard for bone measurement. These new features, plus a light-localizer and a bellyband, add to the DP3's proven capability.

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Our customers comprise over 85% of all clinical facilities using dual-photon absorptiometry. They selected the DP3 because LUNAR's exclusive know-how ensures trouble-free, question-free operation and because of distinct advantages such as:

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**Eberline** 



#### CURRENT ISSUES IN NUCLEAR MEDICINE

## Managing Departmental Costs In A Cost Conscious Environment

TI-201...80NE

Efficient departmental management is no longer an elective procedure for nuclear medicine.

In the cost-conscious environment of today's hospital, administrators are looking more carefully at departmental budgets. At the same time, attending physicians are ordering tests more selectively,

basing their decisions both on the diagnostic information they need and the cost-effectiveness of the study.

#### Understanding Your Costs

This means that you are being asked to become more of a businessman, adding terms like "efficiency" and "productivity" to your medical vocabulary. Now you have to know the real operating costs of your department. What, for example, does it cost to perform a bone scan? Or a thallium study? Are most costs attributable to staff? To equipment? Or to supplies? Can changes in scheduling, inventory or procedure mix reduce these costs?

At Du Pont NEN we've developed a computer-based program to help you determine and analyze costs. Then, you can use the results to increase productivity in your department. It's called Financial Management Analysis (FMA) and it's available to all our customers.

> Visit us at the RSNA Show in Chicago at Booth 1128

#### **NEN Medical Products**

FMA—A Management Program For You

Here's how it works. Your Du Pont NEN representative will help you collect such data as costs for personnel, supplies and instrumentation, the number and kind of studies you perform and the time the studies take. Then, this input will be analyzed by the

computer to show your costs per study, how your staff is being utilized and what your total costs are for every category, from film processing to maintenance. The program can even compare your figures with those of other departments at similar hospitals throughout the country. Your representative will present your FMA in a written report, and will review it with you to help you increase the efficiency of your department. Ask your representative about FMA for your department.

And about our other programs to help you meet the challenges

of nuclear medicine in the '80s.

Our goal is Imaging Excellence: enhancing the image of your department while improving the images in your department.





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#### The CAP-MAC™ Moly Assay Canister

A fully shielded method for molybdenum breakthrough assays. The CAP-MAC encloses the vial during "milking" of your technetium generator; during transport to the ionization chamber; during Mo99 and Tc99m activity measurement; and, finally, for safe removal from the chamber. It's safe — and simple.

#### The Vanderbilt Cardiac Phantom (CP-201)

The CP-201 provides unparalleled simulation of left ventricle and atrium geometry. It produces a variable heartbeat rate and assesses ejection fraction. It rotates to allow for exact determinations of wall motion. The Vanderbilt Cardiac Phantom is the new standard in total imaging system evaluation, including gated studies.

Contact the leader: A Capintec sales representative is ready to demonstrate the latest developments in nuclear medicine quality assurance technology.



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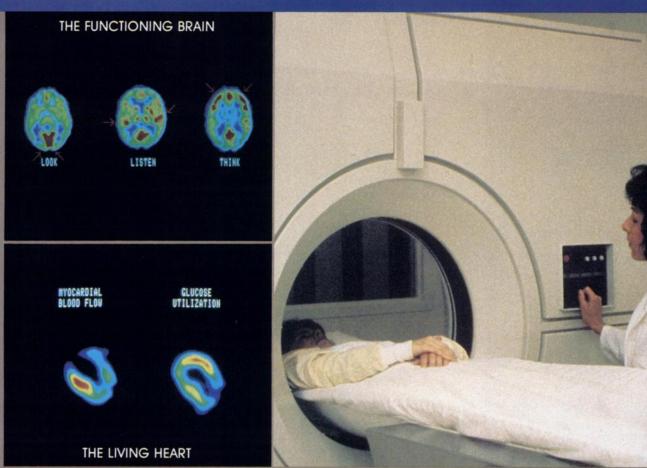
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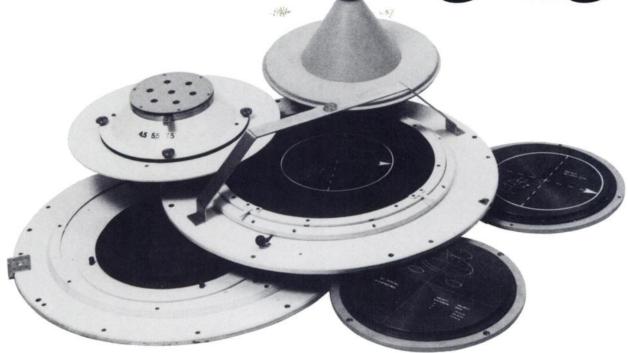
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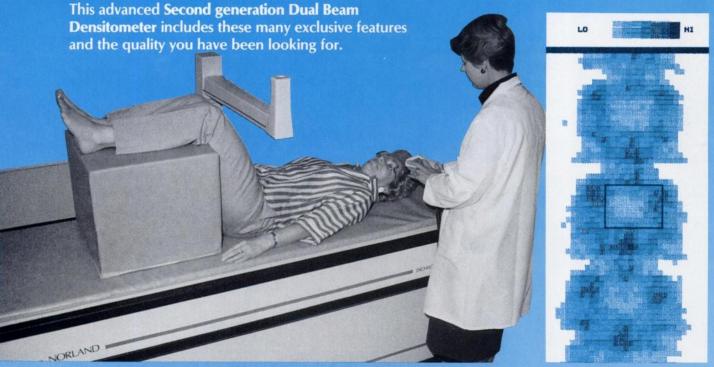
**EDC** manufactures collimators for low, medium and high-energies and for a wide range of sensitivities and resolutions. Your budget for new or replacement equipment will go further when you rely on the EDC collimator specialists.

Send us your requirements and camera model for a price quotation. Need a specific collimator to perform a specific task? Call Product Manager Andy Leask or any of our engineers. EDC can also recore your older collimator for greater efficiency. And EDC delivers, on-time, as promised!



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## NORLAND, THE FIRST NAME IN BONE DENSITOMETERS NOW OFFERS THE NEW 2600 DICHROMATIC



- IBM-PC-XT\* COMPUTER WITH COLOR GRAPHICS DISPLAY plus independent microprocessor to operate the scanner simultaneously while you analyze another patient's data on the IBM-PC. IBM-AT and color printer are also available.
- WHOLE BODY SCANNING TABLE capable of lumbar spine and femoral neck measurements without moving the patient, plus optional Whole Body Calcium software.
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- NEW TECHNIQUE FOR FEMUR NECK SCANS actually scans diagonal to the table axes so the beam moves 90 degrees to the femur neck, providing the most reproduceable and accurate bone density values, with normal patient positioning.
- EXCLUSIVE BONESTAR SOFTWARE SYSTEM includes sophisticated patient data base management capabilities for thousands of data files as well as patient history and statistics. All software is extremely easy to use with menus and IBM's special function keys.
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- PROGRAMMABLE SCANNING SPEEDS from 9.9 cm per second to 0.1 mm per second provide a range of lumbar scanning speeds of 7 minutes to over an hour for maximum spatial resolution.
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EXCLUSIVE DISTRIBUTORS OF NORLAND BONE DENSITOMETERS for the USA and Latin America



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The Norland 2780 single beam densitometer, the most popular system world wide, is now available with advanced software to measure the "5 mm site" of the distal radius recently characterized by Dr. Roy Talmage and colleagues at the University of North Carolina at Chapel Hill, N.C.

In the evaluation of pulmonary perfusion

## IMACROTEC. Technetium Tc 99m Albumin Aggregated Kit

AS



#### More than 90% of particles in optimal 10 to 90 micron range

The average size is 20 to 40 microns... and no particles are greater than 150 microns. You'll get excellent images throughout a full 6 hours after reconstitution. Meets all your lung perfusion evaluation needs...scheduled or stat. Reconstitution time ... only 6 minutes.

#### More than 80% lung uptake for reliable biological efficacy

Low supernatant activity (SA) and very high radiochemical purity (RCP) help assure biological efficacy you can depend on time after time.

Each Macrotec box label includes the average number of particles per vial.

The only MAA product indicated for use in isotopic venography

Toll-Free Technical Customer Service/1-800-257-5181/New Jersey/1-800-582-5913 Please see adjacent page for brief summary.





#### **DESCRIPTION**

Macrotec is a sterile, nonpyrogenic, lyophilized preparation of albumin aggregated. Each 5 ml vial of Macrotec contains 1.5 mg of Albumin Aggregated, 10.0 mg Albumin Human, 0.07 mg (minimum) stannous chloride (SnCl<sub>2</sub>·2H<sub>2</sub>O) and 0.19 mg total tin, maximum (as stannous chloride, SnCl<sub>2</sub>·2H<sub>2</sub>O), 1.8 mg of sodium chloride with trace amounts of sodium acetate, a caetic acid and hydrochloric acid. Macrotec contains no preservatives. The pH of the reconstituted product is between 3.8 and 8.0.

The aggregated particles are formed by denaturation of Albumin Human in a heating and precipitation process. Each vial contains 1-8 million particles, 90% of which are between 10 and 90 microns in size. The average size is 20 to 40 microns; no particles are greater than 150 microns.

Reconstitution of Macrotec with sterile sodium pertechnetate Tc 99m forms an aqueous suspension of Technetium Tc 99m Albumin Aggregated for diagnostic use by Intravenous injection. No less than 90% of the pertechnetate Tc 99m added to the reaction vial is bound to the aggregates at preparation time and remains bound throughout the 6-hour lifetime of the suspension.

#### INDICATIONS AND USAGE

**Lung Imaging** 

Macrotec (Technetium Tc 99m Albumin Aggregated Injection) is a lung imaging agent which may be used as an adjunct in the evaluation of pulmonary perfusion in adults and children. It is useful in the early detection of pulmonary emboli and in the evaluation of the status of the pulmonary circulation in such conditions as pulmonary neoplasm, pulmonary tuberculosis and emphysema.

Isotopic Venography

Macrotec is also indicated for use in isotopic venography as an adjunct in the screening, diagnosis and management of deep vein thrombosis in the lower extremities.

Combined isotopic venography of the lower extremities and the pulmonary vasculature may be performed.

#### CONTRAINDICATIONS

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

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

#### **WARNINGS**

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

#### **PRECAUTIONS**

#### General

In patients with right to left heart shunts, additional risk may exist due to the rapid entry of Albumin Aggregated into the systemic circulation. The safety of this agent in such patients has not been established.

Hypersensitivity reactions are possible whenever proteincontaining materials such as pertechnetate labeled Albumin Aggregated are used in man. Epinephrine, antihistamines and corticosteroids should be kept available for immediate use.

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

The components of the Macrotec (Technetium Tc 99m Albumin Aggregated Kit) are sterile and non-pyrogenic. It is essential to follow directions carefully and adhere to strict aseptic procedures during preparation.

Contents of the vial are intended only for use in the preparation of Technetium Tc 99m Albumin Aggregated Injection and are **NOT** to be administered directly to the patient.

The contents of the kit before preparation are not radioactive. However, after the sodium pertechnetate Tc 99m is added, ade-

quate shielding of the final preparation must be maintained.

The technetium Tc 99m labeling reactions involved depend on maintaining the stannous ion in the reduced state. Hence, sodium pertechnetate Tc 99m containing oxidants should not be employed.

The preparation contains no bacteriostatic preservative. Technetium Tc 99m Albumin Aggregated Injection should be stored at 2-8°C and discarded 6 hours after formulation.

Technetium Tc 99m Albumin Aggregated Injection is a physically unstable suspension and consequently the particles settle with time. Failure to agitate the vial adequately before use may result in non-uniform distribution of radioactive particles.

If blood is drawn into the syringe, unnecessary delay prior to injection may result in clot formation.

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

As in the use of any other radioactive material, care should be taken to minimize radiation exposure to patients consistent with proper patient management, and to minimize radiation exposure to clinical personnel.

#### Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenic potential or whether Technetium Tc 99m Albumin Aggregated Injection affects fertility in males or females.

#### Pregnancy Category C

Animal reproduction and teratogenicity studies have not been conducted with Technetium Tc 99m Albumin Aggregated Injection. It is also not known whether Technetium Tc 99m Albumin Aggregated Injection can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. There have been no studies in pregnant women. Technetium Tc 99m Albumin Aggregated Injection should be given to a pregnant woman only if clearly needed.

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.

#### **Nursing Mothers**

Technetium Tc 99m is excreted in human milk during lactation. Therefore, formula feedings should be substituted for breast feedings.

#### **Pediatric Use**

The lowest possible number of particles should be used in the right-to-left shunting, in neonates and in severe pulmonary disease.

#### **ADVERSE REACTIONS**

Although adverse reactions specifically attributable to the Technetium Tc 99m Albumin Aggregated injection have not been noted, the literature contains reports of deaths occurring after the administration of Albumin Aggregated to patients with pre-existing severe pulmonary hypertension. Instances of hemodynamic or idiosyncratic reactions to preparations of Technetium Tc 99m Albumin Aggregated have been reported.

#### **HOW SUPPLIED**

Macrotec (Technetium Tc 99m Albumin Aggregated) is supplied as a kit containing 10 reaction vials (5 mL size).



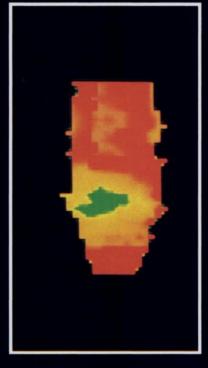
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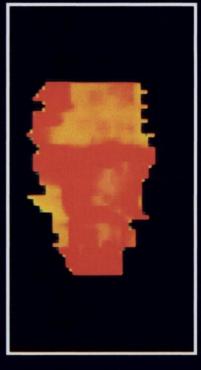
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March 1985

#### QUANTITATIVE, FAST DYNAMIC, CLINICAL IMAGING





LATERAL VIEW Open Bypass To Marginal

**ANTERIOR VIEW LAD Occlusion** 

#### SURFACE DISPLAY OF A 3-D IMAGE

Normal myocardial perfusion in red, red-white Low Flow and myocardial infarction in yellow, green

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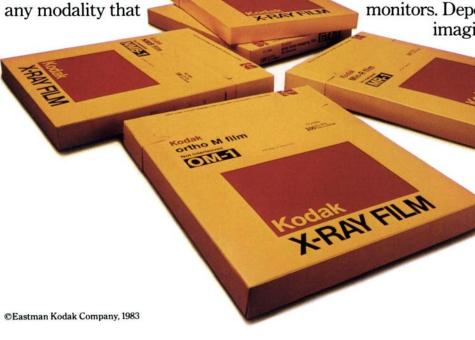
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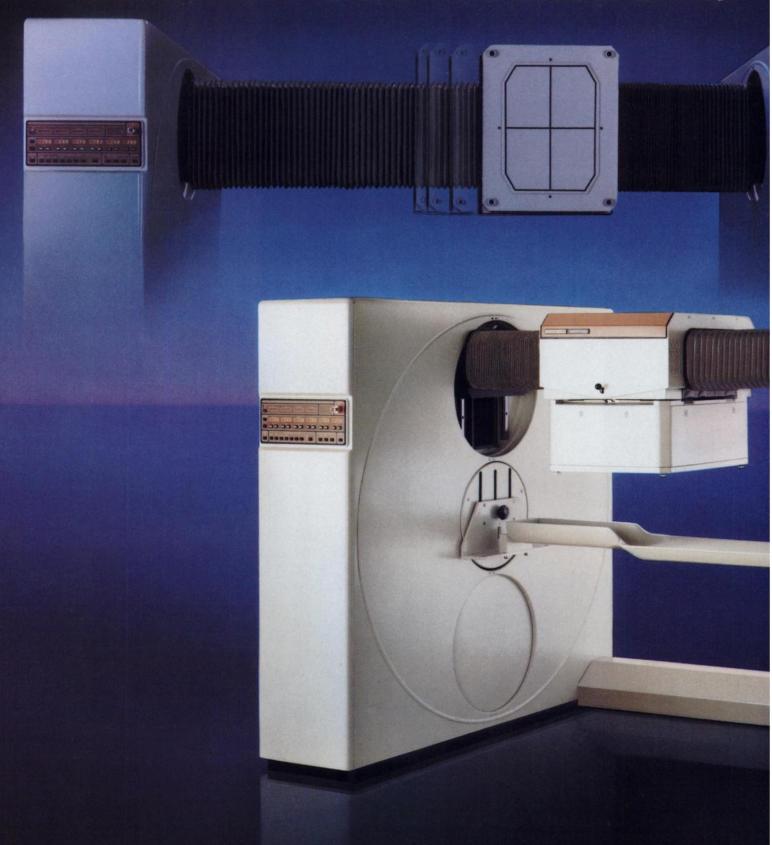
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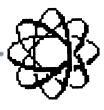
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Washington, D.C., will be the backdrop of our thirty-third Annual Meeting. The meeting includes four days of intensive learning opportunitites interspersed with exciting social events. Sites that are uniquely Washington, D.C., will house our get-togethers.

With our commitment to offering only the very best educational resources available in nuclear medicine, we feel that this meeting will be our finest to date.

#### **SCIENTIFIC PAPERS**

This year's presentation of over 600 scientific papers includes a distillation of the latest advancements and finest work achieved by outstanding scientists and physicians in the field of nuclear medicine. These papers, presented by the original authors, with over 30 subjects to choose from, will provide a unique opportunity for enhancing your knowledge or exploring new avenues in correlative areas of nuclear medicine. Ample time is allotted at these presentations for questions and discussions.

An extensive display of scientific posters and exhibits will augment the presentations.

#### **CONTINUING EDUCATION COURSES**

Refresher and state-of-the-art continuing education courses in chemistry, physics, quality assurance, cardiovascular nuclear medicine, PET, SPECT, and NMR will supply up-to-the-minute approaches and procedures for all clinical settings.

#### **TECHNOLOGIST PROGRAM**

The ever-increasing importance of the role of the nuclear medicine technologist will be explored in our Technologist Program, and over 70 hours of clinical updates wil provide chief and staff technologists with the latest in basic, intermediate, and advanced studies. This program will broaden expertise and enhance the technologist's contributions to nuclear medicine.

#### **EXPOSITION**

More than 1,800 exhibitors from over 90 pharmaceutical and equipment manufacturers will display their latest products in a lively atmosphere. These knowledgeable commercial representatives offer the technical depth our field demands, and they are valuable sources of timely and pertinent information.

#### AUDIOVISUALS, BOOKS, JOURNALS

The Society of Nuclear Medicine is continually adding to its library of audiovisuals, books, and other publications. A stop at the publications booth is well worth the time. Here you will find on display what the society has to offer for year-round educational advancement.

Networking opportunities and job referral boards are available at special locations throughout the meeting as well as membership information at our membership booth.

Registration: \$120 SNM members; \$215 nonmembers

Hotels: \$89 average rate/night

If you need further information, please contact:

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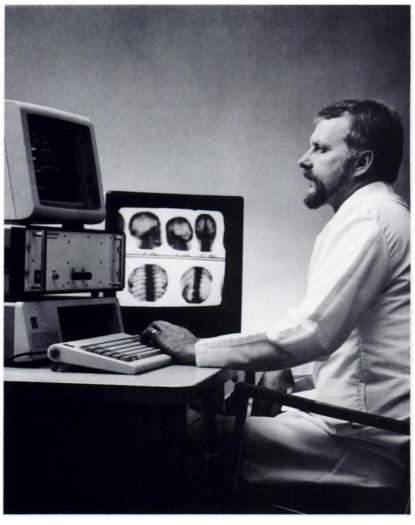
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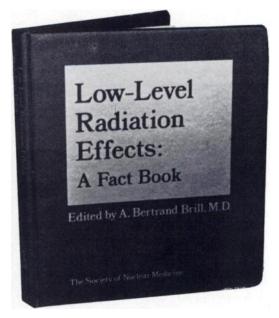
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This book represents a conscientious attempt to provide an unbiased, up-to-date source of knowledge regarding the potential long- and short-term effects of radiation exposure to humans. Because radiation exposure is an important and controversial topic, so much material is available. This fact book contains a concise reference list for readers wishing to obtain additional, or more detailed, information.

Important new sources of information provided the stimulus for publishing the 1985 updates to keep the fact book current. New reports issued by UNSCEAR, ICRP, and NCRP and references to recent publications of findings among Japanese A-bomb survivors have been added.

Available alone, or included with the original document, the 1985 updates will prove indispensable to a wide range of physicians, scientists, engineers, and technologists involved in the field.



"Only when information issued in a publication such as this becomes widespread and understood can rationality prevail in the public's attitude toward lowlevel radiation."

> from the Foreword by Rosalyn Yalow, Ph.D. Nobel Laureate

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- Glossary, Units, and Conversion Factors
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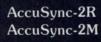
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## **SNM councils**

To satisfy the needs of those individual disciplines within nuclear medicine, The Society of Nuclear Medicine has established special interest Councils that function autonomously within the Society and are open to all interested members.

#### **Academic Council**

The **ACADEMIC COUNCIL** is composed of faculty members of nuclear medicine departments, divisions, or sections in accredited nuclear medicine schools, or in those in AMA approved nuclear medicine residency programs in the U.S. or Canada.

The objectives of the Council are: (1) to promote medical education, research, and patient care related to nuclear medicine; (2) to develop better methods of undergraduate and graduate teaching of nuclear medicine; and (3) to provide a forum for discussion of problems of mutual interest and concern, as well as an informal exchange of ideas and programs. Within the Council there is a subgroup of directors of nuclear medicine residency training programs who confer at least annually with the ABNM on areas of mutual interest.

#### Cardiovascular Council

The CARDIOVASCULAR COUNCIL consists of Society members interested in the performance and application of cardiovascular nuclear medicine procedures. It seeks to provide a forum for discussion and development of cardiac scintigraphic methods in an effort to realize the most beneficial applications. The Council actively seeks individuals who share this goal.

#### **Instrumentation Council**

The **INSTRUMENTATION COUNCIL** promotes the advancement and dissemination of knowledge of instrumentation utilized in nuclear medicine and serves as a resource center in instrumentation for the Society.

#### Computer Council

The **COMPUTER COUNCIL** is made up of Society members who have an interest in computers and their application in the diagnostic, therapeutic, and investigative areas of nuclear medicine. It provides a source of information relating to computer science to the Society membership through its meetings and publications.

#### **Correlative Imaging Council**

The CORRELATIVE IMAGING COUNCIL provides a structure in which clinicians and scientists can develop and disseminate information on the medical and physiological applications of various imaging modalities as they correlate to nuclear medicine.

#### Radioassay Council

The **RADIOASSAY COUNCIL** maintains the scientific, economic, and historic elements of the radioassay discipline within the Society.

### Radiopharmaceutical Science Council

The RADIOPHARMACEUTICAL SCIENCE COUNCIL provides a forum for discussion and dissemination of information relating to the radio-pharmaceutical sciences and promotes and encourages basic radiopharmaceutical research and development within the Society. It publishes a newsletter and holds periodic meetings on special subjects.

If you are interested in joining any or all of the Councils, please contact the Membership Department. The cost for 1986 Council membership is only \$5.00 per council.

The Society of Nuclear Medicine

Membership Department 136 Madison Avenue, New York, NY 10016, (212)889-0717.

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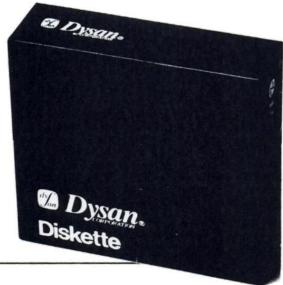
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#### **Classified Advertising**

Policy—The Journal of Nuclear Medicine accepts classified advertisements from medical institutions, groups, suppliers, and qualified specialists in nuclear medicine. Acceptance is limited to Positions Open, Positions Wanted, and Equipment Available. We reserve the right to decline, withdraw, or modify adver-tisements that are not relevant to our readership.

Rates for Classified Listings—\$10.00 per line or fraction of line (approx. 50 characters per line, including spaces). Please allow 28 characters for the first line which will appear in capital letters. Special rates for SNM members on Positions Wanted: \$9.50 per line Most Representations of the State Representation of the State Represen per line. Note: Box numbers are available for the cost of the 2 lines required.

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#### Scientist

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SCIENTIST. UCLA DIVISIONS OF NUCLEAR MEDICINE and Biophysics and Medical Imaging, Department of Radiological Sciences, is recruiting for a scientist, assistant professor level. PhD or equivalent required in physical sciences, engineering, or computer sciences. Entails teaching responsibilities (medical imaging and other topics) in a graduate program in biomedical physics, and for medical students and residents. Involves active par-ticipation in a clinical service including PET, SPECT, and PACS medical imaging networks. Respond with CV to: Michael E. Phelps, PhD, Jennifer Jones Simon Professor and Chief, Division of Nuclear Medicine and Biophysics, Department of Radiological Sciences, UCLA School of Medicine, Los Angeles, CA 90024. EOE.

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NUCLEAR MEDICINE PHYSICIST. The Andre Meyer Department of Physics-Nuclear Medicine of the Mount Sinai Medical Center, New York, is seek. ing a physicist with a doctoral degree, at least 3-5 years experience in nuclear medicine physics, instrumentation in computer applications, and demonstrated skills as a teacher and investigator. Departmental areas of interest include organ modeling (digital image analysis, radiopharmacokinetics, and dosimetry). A program is being developed for a positron imaging facility. Faculty appointment and salary available appropriate to experience level. Interested, qualified candidates should send a CV and letter outlining interests and goals to: Stanley J. Goldsmith, MD, Director, Andre Meyer Department of Physics-Nuclear Medicine, The Mount Sinai Medical Center, One Gustave L. Levy Place, New York, NY 10029. An Equal Opportunity Employer.

NUCLEAR MEDICINE RESIDENCY. The Division of Nuclear Medicine of the Department of Radiology of the New York Hospital-Cornell Medical Center invites applications for its accredited residency program in nuclear medicine beginning July 1, 1986. Requests for information and applications should be directed to: Dr. Salil Sarkar, Program Director, New York Hospital-Cornell Medical Center, 525 East 68th St., New York, NY 10021. An Affirmative Action/Equal Opportunity Employer.

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THE DIVISION OF NUCLEAR MEDICINE OF the Department of Medicine of North Shore University Hospital offers a two-year residency in nuclear medicine. North Shore Univeristy Hospital is an af-filiated teaching hospital of the Cornell University Medical College. The program is comprehensive

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Harvey J. Berger, MD Director, Division of Nuclear Medicine Emory University School of Medicine 1364 Clifton Rd., NE, Atlanta, GA 30322 (404) 727-4843

#### Nuclear Medicine Ultrasound Technologist

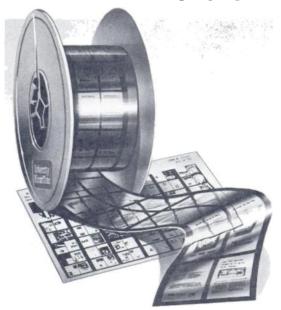
Full-time day, M-F, for a nuclear med/ultrasonologist responsible for full-service nuclear imaging including cardiac and ECT as well as abdominal and OB/GYN ultrasound imaging. Should have CNMT or ARRT (NM) with RDMS preferred and a minimum of 1 yr experience.

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#### STANFORD UNIVERSITY SCHOOL OF MEDICINE Nuclear Medicine Residency Program

Resident positions are available beginning July 1, 1986, for a 2-year program at Stanford University Medical Center and affiliated Veterans' Adm. Medical Center. Patients from the Children's Hospital at Stanford are also studied or treated at the University Hospital. The program, approved by the AMA and satisfying the requirements of the American Board of Nuclear Medicine, includes didactic instruction in radiologic mathematics and physics, radiation safety, dosimetry, electronics, and nuclear medicine instrumentation. A major portion provides practical experience in dynamic and static imaging, computer-assisted manipulation, radioimmunoassay methodology, other in vitro test procedures, and radiopharmacy as part of an integrated patient care program, both diagnostic and therapeutic. Prerequisite for entry into program: 2 years prior training in AMA-approved program in internal medicine, radiology, pathology or pediatrics. Stanford is an Equal Opportunity Affirmative Action Employer. Requests for further information (include CV and reference list) should be directed to:

 ROSS McDOUGALL, MB, ChB, PhD, Professor of Radiology and Medicine Stanford University Medical Center, Stanford, CA 94305



Be prepared, Doctor. More patients will be asking about colorectal cancer. According to an ACS survey\*, many people would like to receive more information about colorectal cancer, and 83% said they would want to be checked for it. Further, they are learning that this cancer can be detected *before* symptoms appear. The present cure rate is 44%. The cure rate *could* be as high as 75%, with early detection and appropriate management.

Ask about the Society's Colorectal Check program of professional and public education for the early detection of colorectal cancer. We're here to help. You can reach us at your local American Cancer Society office or write to our Professional Education Department at National Headquarters, 90 Park Avenue, New York, N.Y. 10016.

"Cancer of the Colon and Rectum: Summary of Public Attitude Survey," Ca 33: 359-365, 1983 (Nov.-Dec.).

This space contributed as a public service.

#### MEDICAL PHYSICIST/TECHNICAL DIRECTOR/NUCLEAR MEDICINE

Research Medical Center has an immediate opening for a medical physicist in the Department of Nuclear Medicine. The Department of Nuclear Medicine is a full service facility with equipment including: Siemens Dual-Headed Rota Camera, Picker Dyna Camera, Searle LFOV, Lunar Bone Densitometer, Informatek Simis III & Simis IV Computer Systems and a CD&A MaxDelta Computer System. Responsibilities include technical and physics support for the Department of Nuclear Medicine as well as hospital radiation safety officer. There are some teaching responsibilities in the Department of Nuclear Medicine, School of Nuclear Medicine Technology. The successful candidate must be knowledgeable of NRC Regulations and licensing procedures. The position also requires computer programming experience. Applicants should have either a Master's or PhD degree with experience in clinical nuclear medicine.



We offer attractive salary and benefit package. Please send resume with salary history to Walter G. Dukestein, MD, Director, Department of Nuclear Medicine, Research Medical, 2316 East Meyer Blvd., Kansas City, MO 64132. EOE



#### NUCLEAR MEDICINE RESIDENCY WITH NMR

The VA Medical Center, Long Beach, affiliated with the College of Medicine at the University of California, Irvine, will have positions in approved AMA Program available July 1986. English language proficiency required (PL 95-201). Program directors: Kenneth P. Lyons, MD, Nuclear Medicine, VA Medical Center; Philip Braunstein, MD, Nuclear Medicine, UCI. Contact:

Norah Milne, MD, Director of Training
Nuclear Medicine Service
VA Medical Center
5901 F. 7th St. Long Reach, CA 90827

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## Educate your patients with... 2 Patient Information Pamphlets

### A Patient's Guide to Nuclear Medicine

Well illustrated, this 16-page pamphlet explains what nuclear medicine is, how the procedures are performed, and how they can help in the early detection of disease.

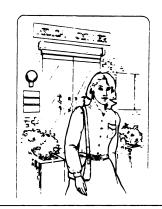
Divided into 3 sections, the guide opens with a general overview of nuclear medicine. A question-and-answer section follows, addressing such topics as safety, the benefits of nuclear medicine procedures, preand post-instructions, and testing of pregnant women and children. The third section explains some of the more commonly performed procedures such as bone, liver, lung, heart, and thyroid uptake scans.

16 pp;  $5^{1/2} \times 8^{1/2}$ ; in 2 colors;

20¢ per pamphlet; minimum order: 100 copies







## Guidelines for Patients Receiving Radioiodine Treatment

Prepared in collaboration with the U.S. Nuclear Regulatory Commission, this 8-page pamphlet answers patients' questions about home care after receiving radioiodine treatment for thyroid conditions.

Easy-to-read language outlines important precautions patients can follow to help reduce radiation exposure to others. It also contains a checklist that physicians can review with their patients to determine which guidelines are appropriate for them and how they should be followed.

8 pp;  $5\frac{1}{2} \times 8\frac{1}{2}$ ; in 2 colors;

30¢ per pamphlet; minimum order: 25 copies

Healthcare professionals in private practice, hospitals, and clinics will find that these pamphlets provide a brief, attractive, and inexpensive way to educate patients and their families about the importance of proper health care.

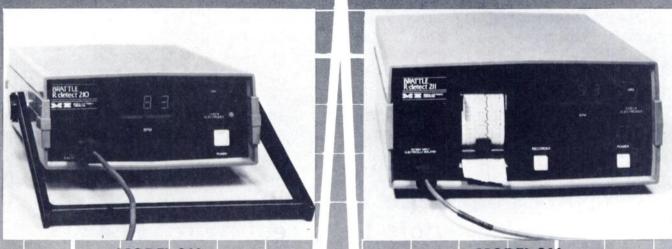
#### ORDERING INFORMATION

Single copies are available for review at \$1.50 each. All prices include postage and handling. Prepayment required in U.S. funds drawn on U.S. banks only. Make checks payable to: The Society of Nuclear Medicine. Prices are in U.S. dollars and subject to change without notice.

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**TECHNETIUM Tc 99m TSC** 

KIT FOR THE PREPARATION OF TECHNETIUM To 99m SULFUR COLLOID INJECTION

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

DESCRIPTION: Each kit contains sufficient material to prepare five (5) formulations. Each formulation consists of a reaction vial containing 0.5 ml 1.0 N hydrochloric acid, and two syringes, one containing a 1.1 ml aqueous solution of 1.9 mg sodium thiosulfate anhydrous and the other containing 5.3 mg gelatin in 2.1 ml of an aqueous buffer solution containing 177 mg sodium acetate anhydrous. All components are sterile and pyrogen-free. When a solution of sterile and pyrogen-free Sodium Pertechnetate Tc 99m Injection is mixed with these components, following the instructions provided with the kit, Technetium Tc 99m Sulfur Colloid Injection is formed. The product so derived is intended for intravenous injection. The precise structure of Technetium Tc 99m Sulfur Colloid Injection is not known at this time. Not less than 92 percent of the radioactivity corresponds to the Technetium Tc 99m (sulfur Colloid Injection is used in adults and children

INDICATIONS AND USAGE: Technetium Tc 99m Sulfur Colloid Injection is used in adults and children as an agent for imaging areas of functional reticuloendothelial cells in the liver, spleen and bone

**CONTRAINDICATIONS: None known.** 

WARNINGS: Although rare, deaths have occurred following intravenously administered gelatin stabilized Tc 99m sulfur colloid. Advanced cardiopulmonary life support systems should be readily available where and when the drug is administered.

PRECAUTIONS:

#### General

The contents of the two syringes, one syringe containing the sodium thiosulfate solution and the second syringe containing the appropriate buffer solution, are intended *only* for use in the preparation of the Technetium Tc 99m Sulfur Colloid Injection and are NOT to be directly administrated by the option of the solution.

preparation of the Technetium Tc 99m Sulfur Colloid Injection and are NOT to be directly administered to the patient.

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

The contents of the kit are sterile and pyrogen-free. It is essential to follow the directions carefully and to adhere strictly to aseptic procedures during preparation. This preparation contains no heaterication corresponding to the procedure of the procedure of the preparation contains no heaterication preparation.

bacteriostatic preservative.

Sodium Pertechnetate Tc 99m solutions containing more than 10 micrograms/ml of aluminum ion should not be used to formulate the Technetium Tc 99m Sulfur Colloid Injection. The Sodium Pertechnetate Tc 99m solution must also be free of oxidizing agents such as peroxides and

Pertectinetate 1: 99m Solution inust also be free of obtouring agents such as peroades and propochlorites.

Technetium Tc 99m Sulfur Colloid Injection is physically unstable, and the particles will settle with time. Failure to agitate the vial adequately before use may result in nonuniform distribution of radioactivity. If there is any delay in administration of the preparation, the syringe should also be gently agitated.

It is also recommended that, because of the increasing probability of agglomeration with aging, a batch of Technetium Tc 99m Sulfur Colloid Injection not be used after six (6) hours from the time of formulation.

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

Technetium Tc 99m Sulfur Colloid Injection, 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 exposure to patients, consistent with proper patient management.

Carcinogenesis, Mutagenesis, Impairment of Fertility
No long term animal studies have been performed to evaluate carcinogenic potential, mutagenic potential, or whether Technetium Tc 99m Sulfur Colloid affects fertility in males or females.

Pregnancy Category C

Animal reproductive and teratogenicity studies have not been conducted with Technetium Tc 99m Sulfur Colloid Injection. It is also not known whether Technetium Tc 99m Sulfur Colloid Injection can cause fetal harm when administered to a pregnant woman, or can affect reproductive capacity. There have been no studies in pregnant women. Technetium Tc 99m Sulfur Colloid Injection should be given to a pregnant woman only if clearly needed.

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.

Nursing Mothers
Technetium Tc 99m is excreted in human milk during lactation. Therefore, formula feedings should be substituted for breast feedings.

De substituted for breast feedings.

ADVERSE REACTIONS: The following adverse reactions have been reported associated with the use of Technetium Tc 99m Sulfur Colloid: cardiopulmonary arrest, seizures, anaphylactic shock, hypotension, dyspnea, abdominal pain, fever, chills, bronchospasm, nausea, vomiting, perspiration, redness, urticaria, numbness, dizziness, and burning at the injection site.

Several deaths and cases of lung and soft tissue uptake other than RES have been reported in association with the use of Technetium Tc 99m Sulfur Colloid (see WARNINGS).

The size and physical-chemical properties of the sulfur colloid particles formed from the components of the kit may determine the biodistribution of the colloid and its uptake by the RES.

Diseases affecting the RES may also after the expected uptake pattern.

HOW SUPPLIED:

#### Kit Contents

- STERILE REACTION VIALS, each containing 0.5 ml 1.0 N hydrochloric acid.
  STERILE SYRINGES, (labeled "A"), each containing 1.9 mg sodium thiosulfate anhydrous in
  1.1 ml aqueous solution.
  STERILE SYRINGES, (labeled "B"), each containing 5.3 mg gelatin in 2.1 ml aqueous buffer
  solution containing 177 mg sodium acetate anhydrous.
  PRESSURE-SENSITIVE LABELS for final preparation of Technetium Tc 99m Sulfur Colloid
- Injection.
  PACKAGE INSERT

Store kit at room temperature: refrigeration not required