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Message in a Bottle

There are many forms of communication and most, by definition, include at least two parties who alternate between sending and receiving information. That there are two parties is important—as it allows for critical assessment of the information being transmitted, which in turn makes for improved future communications. When we are only allowed to transmit, or to receive, there is bound to be miscommunication.

The fax machine is a perfect example of a potential miscommunication tool. It is in a sense a sophisticated way of sending ‘messages in a bottle.’ We place the message in the bottle and the bottle in the electronic stream, and wait. When our machine signals us that transmission has taken place, we say, aha, we have communicated. But that is not necessarily so.

True communication depends on some form of direct linkage between two active parties, and that is a highly underrated and some might even say, rare, phenomena. Even when we encounter our intended communication partner(s) directly, face to face, that link may not be made. This is a situation of which any scientist who has given a lecture is aware.

Is reading a form of communication? Well certainly for the reader and the writer that important two-way link is, at best, delayed. In the case of a biomedical journal, though it is certainly the intention of authors and editors to communicate with their audience, poor communication is not usually fatal. When no linkage occurs, a journal may content itself with lecturing its audience—hoping at some future date, to hear the response.

Perhaps then there is no significance in the fact that there is so little two-way communication between The Journal of Nuclear Medicine and its readers. Each month over 13,000 copies of this Journal are distributed around the world. In the past year, over 2,000 manuscript pages were published, and yet they engendered only 66 letters. Letters, like penmanship, may simply be yet another archaic communication tool in danger of extinction.

It is certainly a sign of the times that various biomedical publications repeatedly publish articles that seem to have no impact on their readers. Using the citation index as an example, a recent editorial by John Maddox in the prestigious journal Nature reported that over 60% of all articles published in scientific journals are not referenced even once. Yet while that statistic clearly suggests that the majority of scientific research does not impress other scientists, it does not mean that the work had no effect on practitioners in the field. Nevertheless, until the staff and contributors to these journals hear otherwise, none will know what the effect of these articles was.

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Same-Day Myocardial Imaging by Technetium-99m-MIBI
A same-day double injection protocol employing 99mTc-MIBI dipyridamole-stress and myocardial SPECT for detecting CAD was compared to 201TI in 30 patients. .............................. Page 369

Linear Gastric Emptying of Hyperosmolar Glucose Solutions
Six normal subjects were studied with hyperosmolar (1.85 mol/l) and dilute (0.62 mol/l) glucose solutions to determine the changes in gastric emptying. ....................... Page 377

rCBF-SPECT In Brain Infarction: When Does It Predict Outcome?
Thallium-201-DDC SPECT was performed on 26 patients with ischemic stroke within 24 hr and after 2 wk and 6 mo. The perfusion deficits on admission correlated best with outcome. ....................... Page 382

Technetium-99m-HMPAO Brain SPECT in Medically Intractable Temporal Lobe Epilepsy: A Postoperative Evaluation
Twenty-one right-sided and 19 left-sided temporal lobectomies were performed. After left-sided surgery, verbal memory was impaired in 8%, if SPECT agreed with the side selected for surgery, but only in 83%, if SPECT diverged from it. ....................... Page 388

Thyroglobulin Level as a Predictive Factor of Tumoral Recurrence in Differentiated Thyroid Cancer
Using multivariate analysis of proportional risk, the regression coefficients obtained allowed the authors to establish the risk of relapse on the basis of a prognostic index. Page 395

Technetium-99m-MRP20, a Potential Brain Perfusion Agent: In Vivo Biodistribution and SPECT Studies in Normal Male Volunteers
The authors report the in vivo biodistribution, radiation dosimetry, and SPECT characteristics of MRP20. ....................... Page 399

Combined Technetium Radioisotope Penile Plethysmography and Xenon Washout: A Technique for Evaluating Corpora Cavernosal Inflow and Outflow During Early Tumescence
Penile blood flow was studied in 14 patients with erectile dysfunctions. ....................... Page 404

Optimal Iodine-131 Dose for Eliminating Hyperthyroidism in Graves' Disease
Patients (605) were treated with increasing doses of radiiodine, and the relationship of dose, age, sex, gland weight, and thyroidal uptake to cure was analyzed. ....................... Page 411

Lung Thallium-201 Uptake During Exercise Emission Computed Tomography
The lung/heart ratio of 201TI was measured from an anterior image during ECT in three groups. The mean +2 s.d. was elevated in 30% of patients with coronary disease. ....................... Page 417

Proposal of a Modified Scintigraphic Method to Evaluate Duodenogastroesophageal Reflux
Twenty-three patients complaining of dyspeptic symptoms underwent modified hepatobiliary scintigraphy wherein biliary reflux was graded using the persistence rather than the intensity of radioactive refluxate. ....................... Page 424

Use of Technetium-MAG3 for Renal Scintigraphy After Angiotensin-Converting Enzyme Inhibition
MAG3 renograms were performed in 82 patients after oral premedication with 50 mg of Captopril. Baseline studies were obtained only for those patients showing abnormal findings in the provocative study. ....................... Page 429

Relative Accuracy of Three Scintigraphic Methods for Determination of Right Ventricular Ejection Fraction: A Correlative Study with Ultrafast Computed Tomography
In 29 patients, RVEF measurements by the ECG-gated first-pass approach showed excellent correlation with ultrafast CT results. In contrast both standard multi-gated blood-pool imaging and the non-gated first-pass beat-by-beat analysis significantly underestimated RVEFs. ....................... Page 436

Thallium-201 Scintigraphy in Differentiated Thyroid Cancer: Comparison with Radioiodine Scintigraphy and Serum Thyroglobulin Determinations
Fifty-two patients with differentiated thyroid carcinoma were evaluated with 201TI, 131I neck and chest images, and serum thyroglobulin measurements. ....................... Page 441

Comparison of Myocardial Imaging with Iodine-123-Iodophenyl-9-Methyl Pentadecanoic Acid and Thallium 201-Chloride for Assessment of Patients with Exercise-Induced Myocardial Ischemia
Modified fatty acid and 201TI were injected in 11 patients during exercise-induced myocardial ischemia. Simultaneous dual-energy planar images were obtained at 5 min and at 3 and 5 hr. All studies were concordantly either positive (8/11) or negative (3/11) by both radionuclides. ....................... Page 447

Endotoxin Reduces Specific Pulmonary Uptake of Radiolabeled Monoclonal Antibody to Angiotensin-Converting Enzyme
The biodistribution of radiolabeled monoclonal antibody to angiotensin-converting enzyme was examined in normal and endotoxin-treated rats. ....................... Page 453
Rapid Localization of Indium-Ill-Labeled Inhibited Recombinant Tissue Plasminogen Activator in a Rabbit Thrombosis Model

After the active plasminogen catalytic site was permanently inhibited with peptides of chloromethyl ketone, so that the radiotracer would bind to fibrin without causing fibrinolysis, the thrombus-localizing properties of modified 111In-labeled rt-PA were investigated in 14 male New Zealand white rabbits.

Detection of Local Staphylococcal Infection in Mice with Technetium-99m-Labeled Polyclonal Human Immunoglobulin

Mice, infected with Staphylococcus aureus in a thigh muscle, received labeled polyclonal human immunoglobulin intravenously. Localization was proportional to the number of bacteria.

In Vivo Comparison of Copper Blood-Pool Agents: Potential Radiopharmaceuticals for Use with Copper-62

The preparation of benzyl-TETA-albumin and its radiolabeling with both 67Cu and 62Cu are discussed. The rat plasma clearance of 67Cu-benzyl-TETA-albumin, [67Cu]-Cu-acetate, and 125I-HSA are compared.

Editorial: Cardiac Blood-Pool Tracers

Imaging Focal Sites of Bacterial Infection in Rats with Indium-111-Labeled Chemotactic Peptide Analogs

Four DTPA-derivatized chemotactic peptide analogs were synthesized and evaluated for in vitro bioactivity and receptor bindings. The peptides were radiolabeled with 111In by trancschelation and biodistribution was determined in rats at 5, 30, 60, and 120 min postinjection.

Editorial: Chemotactic Peptides: New Locomotion for Imaging of Infection

Cellular Internalization, Transport, and Esterification of Iodine-125-NP59 by MA-10 Leydig Tumor Cells

NP59 readily entered MA-10 Leydig tumor cells. The cholesterol analogue entered the cells by binding to the plasma membrane and becoming internalized along with plasma membrane cholesterol.

Technetium-99m-MRP20, a Potential Brain Perfusion Agent: In Vivo Biodistribution and SPECT Studies in Non-Primate Animals

The biodistribution of 99mTc-MRP20 was investigated in female rats. A SPECT study of a beagle dog was performed over 4 hr, and brain uptake was observed by a first-phase dynamic study.

Differences in the Intracellular Processing of the Radiolabel Following the Uptake of Iodine-125- and Technetium-99m-Neogalactosyl Albumin by the Isolated Perfused Rat Liver

A comparison of the uptake and intracellular processing of 125I- and 99mTc-NGA was studied in the isolated perfused rat liver.

Clinicopathologic Conferences: False-Positive Probability in Ventilation/Perfusion Scans

Incidental Demonstration of Pericardial Fistula During Hepatobiliary Scintigraphy

A 48-yr-old man with adenocarcinoma of the esophagus, admitted for nausea, bilious vomiting, and abdominal pain, was found to have a pericardial collection on biliary imaging.

Gallium in Retroperitoneal Fibrosis: Significance of a Negative Result

A patient with retroperitoneal fibrosis and right peritracheal and hilar lymphadenopathy was studied using 67Ga-citrate. No abnormal uptake was seen in regions of retroperitoneal fibrosis, while there was avid uptake in chest lesions shown to be lung cancer.

Absent Splenic Uptake of Indium-111-Oxine-Labeled Autologous Leukocytes in Functional Asplenia

The uptake of the leukocytes was documented to be associated with functional asplenia based on the absence of technetium-sulfur colloid clearance by a morphologically normal spleen.

Quantitative SPECT Reconstruction of Iodine-123 Data

Four attenuation and scatter compensation schemes, incorporated into both the filtered backprojection/Chang and maximum likelihood-expectation maximation reconstruction algorithms, were evaluated in terms of quantitative accuracy, image artifacts, and noise.

Continuing Education: Three-Dimensional Display in Nuclear Medicine and Radiology
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4. Data on file, Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, CT.

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**STORAGE:** Thallous Chloride Tl 201 should be stored at room temperature (15°-30°C). The drug is stable for 90 days after calibration. The labeled activity should be measured by a suitable radioactivity calibration system immediately prior to the patient’s administration.

**PRECAUTIONS:**

- **General:** Do not use if the container is cracked or shows signs of leakage.
- **Intravenous Injection:** For intravenous injection, aseptic technique should be used.
- **Patient Information:** Patients should be advised to avoid any activities that may require driving or operating machinery for at least 24 hours after injection.

**INDICATIONS AND USAGE:** Thallous Chloride Tl 201 is used for the localization of myocardial ischemia and infarction. It is also used for the localization of sites of parathyroid hyperactivity. Thallous Chloride Tl 201 is indicated for the diagnosis and evaluation of myocardial infarction. It may be used to evaluate the size and severity of the perfusion defect(s) in myocardial infarction. It may also be used to evaluate the effect of myocardial infarction and other lesions on myocardial performance.

**SIDE EFFECTS:**

- **Local:** Redness, swelling, itching, and pain at the injection site.
- **Systemic:** Hypotension, bradycardia, and cardiac arrest.

**INTERACTIONS:**

- **Drugs:** Certain drugs may interact with Thallous Chloride Tl 201, including:
  - Antihypertensive drugs
  - Digitalis glycosides
  - Beta-blockers

**CONTRAINDICATIONS:**

- **Known hypersensitivity to Thallous Chloride Tl 201.
- **Recent myocardial infarction.
- **Severe heart block.
- **Complete heart block.
- **Pacemaker.
- **Central nervous system (CNS) abnormalities.
- **Known or suspected pregnancy.
- **Childbearing capacity.

**PREGNANCY CATEGORY:** Thallous Chloride Tl 201 is Pregnancy Category D. It should be used with caution during pregnancy and in breastfeeding women. Women of childbearing age should undergo pregnancy testing before administration.

**NURSING MOTHERS:** Thallous Chloride Tl 201 is excreted in human milk. Nursing mothers should be advised to discontinue nursing or to discontinue the drug to avoid possible adverse effects in the nursing infant.

**ADVERSE REACTIONS:**

- **Local:** Pain at the injection site.
- **Systemic:** Hypotension, bradycardia, and cardiac arrest.

**OVERDOSAGE:**

- **Symptoms:** Hypotension, bradycardia, and cardiac arrest.
- **Treatment:** Supportive care. If cardiac arrest occurs, immediate intubation and mechanical ventilation should be performed. If necessary, inotropic and/or vasopressor agents may be required.
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The 38th Annual Meeting of The Society of Nuclear Medicine will be held in Cincinnati, Ohio on Tuesday, June 11 through Friday, June 14, 1991. The Cincinnati Convention Center is the site of all of the educational activities for this meeting.

CONTINUING EDUCATION ACTIVITIES
A primary focus for every SNM Annual Meeting are the Continuing Education activities that are offered for physicians, scientists, pharmacists, and technologists.

This year we are pleased to offer 7 categorical seminars and over 39 continuing education courses. There will also be a Nuclear Medicine Review Course which is geared for the nuclear medicine resident preparing for the ABNM boards and others who wish to refresh their knowledge for practice in nuclear medicine.

All of the categorical seminars will take place on Monday, June 10 from 8:30 AM - 2:30 PM. All other continuing education sessions will occur over the dates of the meeting.

The Society of Nuclear Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

The Society of Nuclear Medicine is approved by the American Council on Pharmaceutical Education as a provider of continuing pharmaceutical education.

Technologist Section courses are approved for continuing education credit by the Technologist Section of The Society of Nuclear Medicine under the criteria and guidelines established by the Council on the Continuing Education Unit.

TECHNICAL EXHIBITS
Another important component of the meeting is the technical exhibits, where the most advanced products and services for the nuclear medicine practitioner will be displayed. Attendees will have the opportunity to speak with technical experts and to see demonstrations of new equipment in an atmosphere free from the pressures of their busy practices.

Suppliers to the nuclear medicine community traditionally take advantage of the Society’s Annual Meeting to showcase the innovations developed over the past year and to introduce new products. They make their greatest effort to impress and influence their most important customers—our attendees.

This year will be no different: several long-time exhibitors have increased their space, and we anticipate an even larger show, with more exhibitors than 1990’s record-breaking meeting.

ADMINISTRATORS’ PROGRAM
There will be a one-day session for hospital and radiologist administrators attending The Society of Nuclear Medicine’s Annual Meeting. In the morning, there will be speakers and a panel on topics, such as, industry’s attitude toward health care costs, the cost of setting up and running a PET facility, and the future of nuclear medicine as reflected in the manufacturers’ exhibition. In the afternoon, there will be conducted tours of the exhibit hall.

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INDICATIONS AND USAGE  
Technetium Tc 99m Teboroxime is a myocardial perfusion agent that is useful in distinguishing normal from abnormal myocardium in patients with suspected coronary artery disease using rest and stress techniques.  
CONTRAINDICATIONS  
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WARNINGS  
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Contents of the reaction vial are intended only for use in the preparation of Technetium Tc 99m Teboroxime and are not to be administered directly to the patient.  
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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 ensure minimum radiation exposure to occupational workers.  
Tc-99m Teboroxime should be formulated no more than 6 hours prior to clinical use.  
Carcinogenesis, Mutagenesis, Impairment of Fertility  
In comparison with most other diagnostic technetium labeled radiopharmaceuticals, the radiation dose to the ovaries (1.8 rads/50 mCi) is high. Minimal exposure (ALARA) is necessary in women of childbearing capability. (See Dosimetry subsection in DOSAGE AND ADMINISTRATION section.)  
No long-term animal studies have been performed to evaluate carcinogenic potential or to determine the effects of Cardiotec on fertility in males or females. Three different mutagenicity assays (a reversion test with bacteria, a chromosomal aberration assay and an in vivo mouse micronucleus assay) conducted with cold (decayed) technetium labeled Cardiotec gave negative results.

ADVERSE REACTIONS  
Uncommon adverse reactions reported in clinical trials include metallic taste in mouth, burning at injection site, facial swelling, numbness of hand and arm, hypotension and nausea after administration of Technetium Tc 99m Teboroxime.  
Nursing Mothers  
Technetium Tc 99m is excreted in human milk during lactation. Therefore, formula feedings should be substituted for breast feedings.

Pediatric Use  
Safety and effectiveness in children below the age of 18 have not been established.

HOW SUPPLIED  
Cardiotec* (Kit for the Preparation of Technetium Tc 99m Teboroxime) is supplied in kits of 5, 10, and 25 reaction vials.

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- Technical and Clinical Procedures
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- Radionuclide Handling and Radiopharmaceuticals
- Imaging and Non Imaging Instrumentation
- Cardiac Ejection Fraction and Ventricular Wall Motion
- SPECT (Cardiac)
- Proficiency Testing
- Pulmonary Studies
- Renal Function
- Brain Studies
- Radioligands Assays

Abstract Deadline: February 1, 1991

For further information or registration please contact: Danbury Hospital, Department of Public Relations (203) 797-7247.

Call for Abstracts for Works-in-Progress

The 1991 Scientific Program Committee and the Scientific & Teaching Sessions Committee solicit the submission of abstracts from members and nonmembers of The Society of Nuclear Medicine for the 38th Annual Meeting in Cincinnati, OH. Works-in-Progress accepted for the program will be published in a separate on-site show directory that will be distributed to all those who attend the meeting. The accepted Works-in-Progress will also be published in the September issue of the Journal of Nuclear Medicine and, for the Technologist Section, in the September issue of the Journal of Nuclear Medicine Technology. Original contributions on a variety of topics related to nuclear medicine will be considered, including:

- Instrumentation and Data Analysis
- Radioassay
- Radiopharmaceutical Chemistry
- Dosimetry/Radiobiology
- Nuclear Magnetic Resonance Chemistry
- Clinical Science Applications
  - Bone/Joint
  - Cardiovascular (clinical and basic)
  - Endocrine
  - Gastroenterology
  - Neurology (clinical and basic)
  - Oncology (non-antibody)
  - Immunology (antibody)
  - Pediatrics
  - Pulmonary
  - Renal/Electrolyte/Hypertension
  - Hematology/Infectious Disease

Authors seeking publication for the full text of their papers are strongly encouraged to submit their work for immediate review to the JNM, and for the technologist section, to the JNMT.

Deadline for receipt of abstracts for Works-in-Progress is Monday, April 15, 1991.

The official abstract form for Works-in-Progress may be obtained from the October 1990 issue of the JNM or by calling or writing:

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Attn: Abstracts
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CARDIOLITE scans (SPECT) from a 61-year-old female 8 days following acute MI (LFOV camera, high-resolution collimator, 64 x 64 matrix, 180° arc RAO to LPO, 64 projections, 25 s/projection)

High degree of accuracy in detection of myocardial abnormalities

In blinded studies, CARDIOLITE imaging was 83% to 96% sensitive and 79% to 100% specific in detecting myocardial infarction, when compared with final diagnoses1

Reassuring safety profile

No known contraindications
Few adverse reactions

Of 2780 patients in worldwide trials, approximately 8% experienced a transient metallic taste following injection. A few cases of transient headache, mild nausea, flushing, and non-itching rash have also been reported. In worldwide commercial experience, one patient showed signs and symptoms consistent with seizure 8 to 10 min after injection. No other adverse reactions specifically attributable to the use of CARDIOLITE have been reported.1

Reference

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Radiopharmaceuticals
A study in a dog myocardial ischemia model reported that Technetium Tc99m Sestamibi undergoes myocardial distribution (redistribution), although more slowly and less completely than Thallous Chloride Tl-201. A study in a dog myocardial infarction model reported that the drug showed no redistribution of any consequence. Definitive human studies to demonstrate possible redistribution have not been reported. In patients with documented myocardial infarction, imaging revealed the infarct up to four hours post dose.

Animal studies have shown that myocardial uptake is not blocked when the sodium pump mechanism is inhibited. Myocardial uptake which is coronary flow dependent is 1.2% of the injected dose. The following table illustrates the biological clearance as well as effective clearance (which includes biological clearance and radionuclide decay) of Tc99m Sestamibi from the heart and liver:

<table>
<thead>
<tr>
<th>Time</th>
<th>Biological</th>
<th>Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 mins</td>
<td>1.2</td>
<td>20</td>
</tr>
<tr>
<td>30 mins</td>
<td>1.1</td>
<td>12</td>
</tr>
<tr>
<td>1 hour</td>
<td>1.0</td>
<td>5.6</td>
</tr>
<tr>
<td>2 hours</td>
<td>1.0</td>
<td>2.2</td>
</tr>
<tr>
<td>4 hours</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.4</td>
</tr>
</tbody>
</table>

INDICATIONS AND USAGE: CARDIOLITE® Kit for the preparation of Technetium Tc99m Sestamibi is a myocardial perfusion agent that is useful in distinguishing normal from abnormal myocardium, and in the localization of the abnormality, in patients with suspected myocardial infarction.

CARDIOLITE®, Kit for the preparation of Technetium Tc99m Sestamibi is also useful in the evaluation of myocardial function using the first pass technique.

CONTRAINDICATIONS: None known.

WARNINGS: In studying patients in whom cardiac disease is known or suspected, care should be taken to assure continuous monitoring and treatment in accordance with safe, accepted clinical procedure.

PRECAUTIONS:

GENERAL

The contents of the vial are intended only for use in the preparation of Technetium Tc99m Sestamibi and are not to be administered directly to the patient without first undergoing the preparative procedure.

Radioactive drugs must be handled with care and appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Also, care should be taken to minimize radiation exposure to the patients consistent with proper patient management.

Contents of the kit before preparation are not radioactive. However, after the Sodium Pertechnetate Tc99m Injection has been added, adequate shielding of the final preparation must be maintained.

The components of the kit are sterile and non-pyrogenic. It is essential to follow directions carefully and to adhere to strict aseptic procedures during preparation.

Technetium Tc99m labeling reactions involved depend on maintaining the stannous ion in the reduced state. Hence, Sodium Pertechnetate Tc99m Injection containing oxidants should not be used.

Technetium Tc99m Sestamibi should not be used more than six hours after preparation.

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.

Carcinogenesis, Mutagenesis, Impairment of Fertility

In comparison with most other diagnostic technetium labeled radiopharmaceuticals, the radiation dose to the ovaries (1.5 rads/30mcI) is high. Minimal exposure (ALARA) is necessary in women of childbearing capability. (See Dosimetry subsection in DOSAGE AND ADMINISTRATION section.)

The active intermediate, Cu(MIBI), Bf2, was evaluated for genotoxic potential in a battery of five tests. No genotoxic activity was observed in the Ames, CHO/HPTG and sister chromatid exchange tests (all in vitro). At cytotoxic concentrations (≤20μg/ml), an increase in cells with chromosome aberrations was observed in the in vitro human lymphocyte assay. Cu(MIBI), Bf2 did not show genotoxic effects in the in vivo mouse micronucleus test at a dose which caused systemic and bone marrow toxicity (60mg/kg, >60x maximal human dose).

Pregnancy Category C

Animal reproduction and teratogenicity studies have not been conducted with Technetium Tc99m Sestamibi. It is also not known whether Technetium Tc99m Sestamibi can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. There have been no studies in pregnant women. Technetium Tc99m Sestamibi should be given to a pregnant woman only if clearly needed.

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.
INSTRUCTIONS FOR PREPARATION OF Technetium Tc99m Sestamibi

Preparation of the Technetium Tc99m Sestamibi from the Kit for the preparation of Technetium Tc99m Sestamibi is done by the following aseptic procedure:

i. Add the reaction vial using a suitable radioactivity calibration system. Record the Technetium Tc99m concentration, total volume, assay time and date, expiration time and lot number on the vial shield label and affix the label to the shield.

ii. Store the reaction vial containing the Technetium Tc99m Sestamibi at room temperature (15-30°C) until use; at such time the product should be aseptically withdrawn. Technetium Tc99m Sestamibi should be used within six hours of preparation. The vial contains no preservative.

Note: Adherence to the above product reconstitution instructions is recommended. The product should be used within 6 hours after preparation.

Final product with radiochemical purity of at least 90% was used in the clinical trials that established safety and effectiveness. The radiochemical purity was determined by the following method:

DETERMINATION OF RADIOCHEMICAL PURITY IN Technetium Tc99m Sestamibi

1. Obtain a Baker-Flex Aluminum Oxide coated, plastic TLC plate, #1 B-F, pre-cut to 2.5 cm x 7.5 cm.

2. Dry the plate or plates at 100°C for 1 hour and store in a desiccator. Remove pre-dried plate from the desiccator just prior to use.

3. Apply 1 drop of ethanol* using a 1 ml syringe with a 22-26 gauge needle, 1.5 cm from the bottom of the plate. The SPOT SHOULD NOT BE ALLOWED TO DRY.

4. Add 2 drops of Technetium Tc99m Sestamibi solution, side by side on top of the ethanol* spot. Return the plate to a desiccator and allow the sample spot to dry (typically 15 minutes).

5. The TLC tank is prepared by pouring ethanol* to a depth of 3-4 mm. Cover the tank and let it equilibrate for 10 minutes.

6. Develop the plate in the covered TLC Tank in ethanol* for a distance of 5 cm from the point of application.

7. Cut the TLC plate 4 cm from the bottom and measure the Tc99m activity in each piece by appropriate radioactivity detector.

8. Calculate the % Tc99m Sestamibi as:

\[
\% \text{Tc99m Sestamibi} = \frac{\muCi \text{ Top Piece}}{\muCi \text{ Both Pieces}} \times 100
\]

Table 4. Radiation Absorbed Doses from Tc99m Sestamibi

<table>
<thead>
<tr>
<th>Organ</th>
<th>Estimated Radiation Absorbed Dose</th>
<th>2.0 hour void</th>
<th>4.8 hour void</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>rads/30 mCi</td>
<td>mGy/110 MBq</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mGy/110 MBq</td>
<td>mGy/110 MBq</td>
</tr>
<tr>
<td>Breasts</td>
<td></td>
<td>2.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Gallbladder Wall</td>
<td></td>
<td>20.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Small Intestine</td>
<td></td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Upper Large Intestine Wall</td>
<td></td>
<td>5.4</td>
<td>55.5</td>
</tr>
<tr>
<td>Lower Large Intestine Wall</td>
<td></td>
<td>4.2</td>
<td>41.1</td>
</tr>
<tr>
<td>Stomach Wall</td>
<td></td>
<td>0.6</td>
<td>6.1</td>
</tr>
<tr>
<td>Heart Wall</td>
<td></td>
<td>0.5</td>
<td>5.1</td>
</tr>
<tr>
<td>Kidneys</td>
<td></td>
<td>2.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Liver</td>
<td></td>
<td>0.6</td>
<td>5.8</td>
</tr>
<tr>
<td>Lungs</td>
<td></td>
<td>0.3</td>
<td>2.8</td>
</tr>
<tr>
<td>Bone Surfaces</td>
<td></td>
<td>0.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Thymus</td>
<td></td>
<td>0.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Ovaries</td>
<td></td>
<td>1.5</td>
<td>15.5</td>
</tr>
<tr>
<td>Testes</td>
<td></td>
<td>0.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Red Marrow</td>
<td></td>
<td>0.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Urinary Bladder</td>
<td></td>
<td>2.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Wall</td>
<td></td>
<td>0.5</td>
<td>4.8</td>
</tr>
</tbody>
</table>

*(The ethanol used in the procedure should be 95% or greater. Absolute ethanol (99%) should remain at 2:95% ethanol content for one week after opening and stored tightly capped, in a cool dry place.

RADIATION DOSIMETRY: The radiation doses to organs and tissues of an average patient (70 kg) per 925-5550 MBq (25-150 mCi) of Technetium Tc99m Sestamibi injected intravenously are shown in Table 4.

Nursing Mothers

Technetium Tc99m Pertechnetate is excreted in human milk during lactation. It is not known whether Technetium Tc99m Sestamibi is excreted in human milk. Therefore, formula feedings should be substituted for breast feedings.

Pediatric Use

Safety and effectiveness in children below the age of 18 have not been established.

ADVERSE REACTIONS: During clinical trials, approximately 8% of patients experienced a transient metallic or bitter taste immediately after the injection of Technetium Tc99m Sestamibi. A few cases of transient headache, flushing and non-itching rash have also been attributed to administration of the agent. One patient demonstrated signs and symptoms consistent with seizure, eight to ten minutes after administration of the drug. No other adverse reactions specifically attributable to the use of Technetium Tc99m Sestamibi have been reported.

DOSE ADMINISTRATION: The suggested dose range for I.V. administration to be employed in the average patient (70 kg) is:

370-1100 MBq (10-30 mCi)

The dose administered should be the lowest required to provide an adequate study consistent with ALARA principles (See also PRECAUTIONS).

When used in the diagnosis of myocardial infarction, imaging should be completed within four hours after administration (see also CLINICAL PHARMACOLOGY). The patient dose should be measured by a suitable radioactivity calibration system immediately prior to patient administration. Radiochemical purity should be checked prior to patient administration.

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration whenever solution and container permit.

Store at room temperature (15-30°C) before and after reconstitution.

HOW SUPPLIED: Du Pont’s CARDIOLITE®, Kit for the preparation of Technetium Tc99m Sestamibi

1. Obtain a Baker-Flex Aluminum Oxide coated, plastic TLC plate, #1 B-F, pre-cut to 2.5 cm x 7.5 cm.

2. Dry the plate or plates at 100°C for 1 hour and store in a desiccator. Remove pre-dried plate from the desiccator just prior to use.

3. Apply 1 drop of ethanol* using a 1 ml syringe with a 22-26 gauge needle, 1.5 cm from the bottom of the plate. The SPOT SHOULD NOT BE ALLOWED TO DRY.

4. Add 2 drops of Technetium Tc99m Sestamibi solution, side by side on top of the ethanol* spot. Return the plate to a desiccator and allow the sample spot to dry (typically 15 minutes).

5. The TLC tank is prepared by pouring ethanol* to a depth of 3-4 mm. Cover the tank and let it equilibrate for 10 minutes.

6. Develop the plate in the covered TLC Tank in ethanol* for a distance of 5 cm from the point of application.

7. Cut the TLC plate 4 cm from the bottom and measure the Tc99m activity in each piece by appropriate radioactivity detector.

8. Calculate the % Tc99m Sestamibi as:

\[
\% \text{Tc99m Sestamibi} = \frac{\muCi \text{ Top Piece}}{\muCi \text{ Both Pieces}} \times 100
\]

*The ethanol used in the procedure should be 95% or greater. Absolute ethanol (99%) should remain at 2:95% ethanol content for one week after opening and stored tightly capped, in a cool dry place.

How Supplied: Du Pont’s CARDIOLITE®, Kit for the preparation of Technetium Tc99m Sestamibi is supplied as a 5ml vial in lots of two (2), five (5) and thirty (30) vials, sterile and non-pyrogenic.

Prior to lyophilization the pH is between 5.3-5.9. The contents of the vials are lyophлизed to a fine powder and stored under nitrogen. Store at room temperature (15-30°C) before and after reconstitution. Technetium Tc99m Sestamibi contains no preservatives. Included in each two (2) vial kit is one (1) package insert, five (5) vial shield labels and five (5) radiation warning labels. Included in each five (5) vial kit is one (1) package insert, five (5) vial shield labels and five (5) radiation warning labels. Included in each thirty (30) vial kit is one (1) package insert, thirty (30) vial shield labels and thirty (30) radiation warning labels.

The U.S. Nuclear Regulatory Commission has approved this reagent kit for distribution to persons licensed to use by product material identified in 35, 30 and 35, 200 of 10 CFR Part 35, to persons who hold an equivalent license issued by an Agreement State, and, outside the United States, to persons authorized by the appropriate authority.

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Faculty—VA/VA PET Center seeking qualified individual at assistant professor level or above to direct CARDIO-VASCULAR NUCLEAR MEDICINE. Strong experimental or clinical research interest is preferable. Send or FAX CV: Dr. Robert Souleza, Yale/Va PET Center, 115, 930 Campbell Ave., West Haven, CT 06516 FAX: (213) 975-8155

Fellowship—FELLOWSHIP IN BRAIN SPECT IMAGING. The Department of Radiology at the Brigham and Women's Hospital/Harvard Medical School, has an opening for one fellowship position in clinical and functional brain imaging using single photon emission computed tomography (SPECT) scanning. The fellowship is designed for individuals interested in pursuing a career in clinical or research-oriented nuclear medicine and in obtaining training in clinical and research aspects of nuclear medicine. A full-time position is available immediately. Salary and benefits are competitive. Please send curriculum vitae and 3 letters of recommendation to Dr. David Yuille, Director of Nuclear Medicine, 200 Longwood Avenue, Boston, MA 02115. Brigham and Women's Hospital/Harvard Medical School is an affirmative action/equal opportunity educator and employer.

One year PEDIATRIC NUCLEAR MEDICINE FELLOWSHIP beginning Summer 1994. Fellowship position at a 270-bed tertiary care, preeminent pediatric center. 2000 imaging procedures per year encompassing all aspects of nuclear medicine including full RIA studies, with emphasis on teaching and research. Staff includes 4 physicians, 22 technologists, 24 technologist trainees and a technical staff of eight. Two SPECT gamma cameras, one large field, one portable camera for clinical and research camera-computer system, and a state-of-the-art image processing and display system with networking. Salary approximately $30,000 per annum. AABMT eligibility or certification required. Contact: James J. Conway, MD, Chief, Division of Nuclear Medicine, The Children's Memorial Hospital, 2300 Children's Plaza, Chicago, IL 60640, (312) 880-4416.

Pharmacist—NUCLEAR PHARMACIST. The University of Michigan Nuclear Pharmacy is now accepting applications for a full-time staff Nuclear Pharmacist position. A B.S. in pharmacy and eligibility for licensure in the state of Michigan is required. Experience as a registered pharmacist working in a centralized or hospital pharmacy setting is preferred. The successful candidate should exhibit skill in the operation of computerized systems and the ability to produce a major role in the operational and clinical duties of the U of M Nuclear Pharmacy. This position offers an opportunity to gain experience in state-of-the-art technology associated with the research and development of PET and SPECT radiopharmaceuticals. The University of Michigan Medical Center. Please send curriculum vitae referencing posting number M1802YH to: Medical Campus Human Resources Department. 800 North Ingalls Building. NSM04/041B. Ann Arbor, Michigan 48109-0418.

New England Medical Center Hospital, a 480-bed teaching hospital and research center, is accepting applications for a full-time NUCLEAR PHARMACIST. A Masters Degree in Nuclear Pharmacy and a minimum of two years experience in Nuclear Medicine are required. Responsibilities include clinical activities, a broad range of research activities and ongoing education of radiology residents, staff, fellows, and students. Interested applicants should send a current curriculum vitae and letter of interest to Dr. Dorothy H. Toupin, Director of Nuclear Medicine, New England Medical Center Hospital, 171 Harrison Avenue, Boston, MA 02111. No phone calls please. We are an equal opportunity employer.

Pharmacist—NUCLEAR MEDICINE PHYSICIAN. The Permanente Medical Group's Santa Clara facility is currently seeking a Nuclear Medicine Physician for this full-time position to join our staff of two physicians. Our teaching hospital has academic affiliation with Stanford University, and is active in SPECT. We require experience in thyroid, lung, and head/neck. For more information, call Norton Snyder, MD at (408) 236-4500 or send your CV to Kaiser Foundation Hospital, 900 Kicy Blvd., Santa Clara, CA 95053-0412.

NUCLEAR MEDICINE PHYSICIAN. Position immediately available for Board Certified (ABNM or ABR) with special interest in pediatric nuclear cardiology. The Section of Nuclear Medicine serves a large outpatient population as well as approximately 2,000 inpatient admissions annually. Facilities currently include over twenty SPECT and planar state-of-the-art gamma cameras and a large networked nuclear medicine computer system. Responsibilities include clinical image interpretation, teaching, and functional research studies. A solid foundation in academic radiology will be determined by experience, training, and research record. For further information, please contact Lee Forrest, MD, at (507) 284-8895, or send your curriculum vitae to The Section of Nuclear Medicine, Charlton 2N-325, Mayo Clinic, Rochester, MN 55905-0408. Mayo Clinic is an equal opportunity affirmative action employer.

Resident—Two- and four-year NUCLEAR MEDICINE RESIDENCIES are available at St. Luke's University Medical Center, Milwaukee, WI, a 650-bed tertiary care community hospital and is the sixth largest medical center in the U.S. As such, the program is particularly strong in nuclear cardiology and SPECT. Located in central Washington, a perfect location for living and recreation, the area offers skiing, fishing, and boating. Send curriculum vitae to: B. Leonard Holman, MD, Department Chairman, Department of Radiology. Brigham and Women's Hospital/Harvard Medical School is an equal opportunity employer.

Radiation Safety Officer—The Medical College of Wisconsin is seeking an individual responsible for all aspects of the radiation safety program at the Medical College of Wisconsin. Freidheim Memorial Lutheran Hospital, and Milwaukee County Medical Complex. The Radiation Safety Officer will include ensuring compliance with Nuclear Regulatory Commission requirements for the licenses held by the Medical College of Wisconsin on behalf of the three participating institutions. Position requires a B.S. degree with training in health physics, radiological physics, or related field and a minimum of two years supervisory experience in radiation safety at a medical research institution. Master's degree preferred. Send resume to: Personnel Resources Department. 300 North Ingalls Building. M1802YH Ann Arbor, Michigan 48109-0418. Equal Opportunity Employer M/F/H

Research Associate—Position available in the Division of Nuclear Medicine of the University of Cincinnati Medical Center. Assist in design and execution of complex and varied experimental activities involving radioactive materials, tissue culture techniques, and preparation of monoclonal antibodies, development of new radiopharmaceuticals for diagnostic and therapeutic application. Some routine preparation and quality control. Submit curriculum vitae and salary history to: Dr. John D. O’Connor, Department of Radiology, University of Cincinnati, PO Box 13100, Cincinnati, OH 45267-0577. The University of Cincinnati is an Equal Opportunity Employer.

Technologist—NUCLEAR MEDICINE TECHNOLOGIST. Immediate full-time position available for a registered technologist with two years experience in thyroid, lung, and head/neck imaging. Send your curriculum vitae to: B. Leonard Holman, MD, Department Chairman, Department of Radiology. Brigham and Women's Hospital/Harvard Medical School. An equal opportunity employer.

NUCLEAR MEDICINE TECHNOLOGIST. St. John's Regional Health Center, an 865-bed acute care facility, has an immediate full-time opening for a nuclear medicine technologist. Applicants must have experience in cardiovascular data processing, SPECT imaging, and all other facets of nuclear medicine. We offer an excellent benefits package and friendly working environment. Please send your curriculum vitae to: Jeannette F. Fearnley, Personnel Department. St. John's Regional Health Center, 2301 E. Cheyenne Road, Springdale, AR 72764. Equal Opportunity Employer. For more information, please call (501) 765-9600.

NUCLEAR MEDICINE TECHNOLOGIST. Full-time position available for a registered or registry eligible Nuclear Medicine Technologist in a progressive, 120-bed acute care facility. Applicants must have experience in SPECT and planar imaging. For further information, please contact Jim Philbrick, Program Coordinator, Nuclear Medicine Technologist Program, New England Medical Center Hospital, a 480-bed teaching hospital and research center, with state of the art imaging equipment and research facilities. Interested technologists should contact Dr. David Yuille, 200 Longwood Avenue, Boston, MA 02115. No phone calls please. We are an equal opportunity employer.


NUCLEAR MEDICINE TECHNOLOGIST. St. John's Regional Health Center, an 865-bed acute care facility, has an immediate full-time opening for a nuclear medicine technologist. Applicants must have experience in cardiovascular data processing, SPECT imaging, and all other facets of nuclear medicine. We offer an excellent benefits package and friendly working environment. Please send your curriculum vitae to: Jeannette F. Fearnley, Personnel Department. St. John's Regional Health Center, 2301 E. Cheyenne Road, Springdale, AR 72764. Equal Opportunity

NUCLEAR MEDICINE TECHNOLOGIST. Big city technology with small town appeal! Full-time day shift position available immediately. Requires certification by the NMTBC or ARRT(N). One year experience including SPECT experience preferred. Affiliated with Health Services. A progressive 231-bed acute care regional referral center located in the beautiful Pacific Northwest. One hour north of Seattle and surrounded by outstanding recreational opportunities available. Competitive salary and benefits. Contact Jim Chaffin, Department of Radiology, 5101 E. 14th St., Yakima, Washington 98902. (509) 575-5096. Equal Opportunity Employer. For more information, please call (501) 765-9600.

NUCLEAR MEDICINE TECHNOLOGIST. St. Francis Hospital and Medical Center, a 378-bed acute care facility is seeking an ARRT or CNMRT registered and eligible technician in nuclear medicine. Our progressive department utilizes state-of-the-art equipment, processes 500 exams a month, and 4-5 SPECT
Positions Wanted

ABNM-certified MD seeks new full-time position. Extensive and varied NUCLEAR MEDICINE experience includes SPECT and features thyroid. Reply to: Box 202. The Society of Nuclear Medicine, 136 Madison Ave., New York, NY 10016-6760.

NUCLEAR PHYSICIAN. ABR/ABNM, for semi-academic private practice position. Extensive experience all areas NM except R1A. Experienced sonologist. 26 years computer experience, with interest in image capture/transmission, electronic networking, HIS/RIS/NMIS. Age 43, excellent health. Management training—ACPE II/I. TQE—and experience. Available 7/1/91. Reply to: The Society of Nuclear Medicine, Box 201, 136 Madison Ave., New York, NY 10016.

Equipment

For sale: Technicare 420/550. ADAC's vertical CDS. system I. system II. DPS 2800. We offer the highest prices for all types of nuclear medicine cameras & computers. Call Franklin at Imaging Solutions (415) 924-9655.

Raytheon Step I/Step II Gamma Camera System has 91 LFOV Detector, uniformity correction, multi-imager and 3 collimators w/cart (HiRes, G.P. and Medium Energy). $15,000.00. Installation available. Call (203) 487-5880 FAX (203) 481-8589, or write to: Connecticut Medical Systems, 550-29 East Main Street, Branford, CT 06405.

Nuclear Medicine Technologists

The University of Texas M.D. Anderson Cancer Center, one of the world's leading comprehensive cancer institutions, is seeking registered or registry eligible candidates in Nuclear Medicine to work in our fully computerized and highly automated Division of Diagnostic Imaging.

M.D. Anderson, located within the renowned Texas Medical Center in Houston, offers reimbursement for interviewing expenses, interest free loans, competitive salaries, an excellent benefit package, and relocation assistance. Houston offers diverse cultural, dining, sports, and entertainment activities and Texas residents do not pay state income tax.

We recognize your contribution as a prestigious professional and encourage you to call Victor Stonebrook at (713) 792-8005 collect or send your resume to: M.D. Anderson Cancer Center, 1515 Holcombe Blvd., HMB 205, Houston, Texas 77030.
NUCLEAR MEDICINE TECHNOLOGISTS

The Saudi Arabian Oil Company (SAUDI ARAMCO), one of the world's largest producers and exporters of oil and gas, has openings for Nuclear Medicine Technologists in its Medical Services Organization in Saudi Arabia. Requires certification by ARRT or NMTCB; Bachelor's degree preferred. Must have a minimum of 4 years' experience in all Nuclear Medicine modalities, including Cardiac Imaging.

Compensation consists of a base salary and an expatriate premium (up to 45% of the base salary). Annually, there are up to 13 paid holidays, plus you will earn 36 vacation days and round-trip airfare to the U.S. or Canada. It's the chance of a lifetime to visit Europe, Africa and Asia. Additional benefits include a company matched savings plan, non-contributory group life insurance, and free medical care at company facilities.

For consideration, send your resume/salary history to: ASC, Employment Dept. 06L-024-1, P.O. Box 4530, Houston, Texas 77210-4530, or call TOLL FREE 1-800-827-5700, Ext. 4199, or COLLECT (713)432-4199.

SAUDI ARAMCO

The University of Pittsburgh Medical Center, Department of Radiology is expanding its Nuclear Medicine division to include a PET Center. Several openings are immediately available.

NUCLEAR MEDICINE

Physicist/Medical Physics

Candidates must be board certified or board eligible with a Ph.D. in Physics/Medical Physics. The candidates are required to have a thorough knowledge of gamma cameras, SPECT technology, and computers and will support the clinical Nuclear Medicine efforts. This position also requires teaching of residents, physicians, and other scientists in Nuclear Medicine, as well as providing support in various research activities within the Nuclear Medicine program.

PET CENTER

Medical Director of the Nuclear Medicine PET Center

Candidates must have experience in PET technology, administration of day-to-day operations, directing research, and interest in neuroscience, oncology and cardiac PET applications.

Radiochemist

Candidates must have a Ph.D. in chemistry or related discipline, good working knowledge of cyclotron operations and related chemistry/radiochemistry. The primary focus of the position will be PET Radiopharmaceutical Research and Development.

Physicist

Candidate must be board certified or board eligible and possess a Ph.D. in Physics or Medical Physics. The candidate must have experience in PET physics and instrumentation. The position requires physicist support and includes instrumentation, computer software development and collaboration with physicians, residents and other scientists involved in PET activities.

Salary and fringe benefits are very competitive. Faculty rank will be based on previous experience.

inquiries and curriculum vitae should be addressed to:
Manuel L. Brown, M.D., Division of Nuclear Medicine,
University of Pittsburgh Medical Center, Desoto at O'Hara Streets, Pittsburgh, PA 15213

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ASSOCIATE DIRECTOR, NUCLEAR MEDICINE
San Francisco General Hospital Medical Center
Department of Laboratory Medicine
University of California San Francisco

The Division of Nuclear Medicine is seeking an experienced physician to assist in directing the clinical services, teaching, and research for an established program. Faculty appointment will be at a level commensurate with qualifications and experience in an appropriate series in the Department of Laboratory Medicine. The incumbent will assist the Director of the Nuclear Medicine Division in all responsibilities and act for him in his absence. Duties include supervision of staff, management of an AMA-approved 2-year residency program, and clinical duties with opportunities for research and public service. Expertise in computerized methods is desirable. Two nuclear medicine residents are supervised on a daily basis; additional teaching opportunities depend on individual interests. Opportunity for research can draw on resources of University of California campuses at Berkeley and Davis as well as at San Francisco. Participation in the activities of professional societies is supported and encouraged.

Qualifications: Eligible for medical licensure in California, certification by the American Board of Nuclear Medicine, and suitable for appointment to the faculty of the University of California San Francisco.

Interested candidates should submit references and curriculum vitae to: Melvin D. Cheitlin, M.D., Chairman, Search Committee, Cardiology Division, Room SGI, San Francisco General Hospital, San Francisco, CA 94110.

The University of California, San Francisco is an equal opportunity and affirmative action employer. Minority, women, handicapped, and veteran candidates are encouraged to apply.

CHIEF
NUCLEAR MEDICINE
TECHNOLOGIST

The Nuclear Medicine department of a progressive acute medical center has an exciting and challenging career opportunity for an experienced individual to assume an administrative position. Equipment includes two state-of-the-art SPECT cameras, one portable camera and three computers. Certification by the ARRT and NMTCB is required. Bachelor's Degree is preferred. Competitive salary with an excellent flexible benefit program.

Please send resume to:
Department of Human Resources
Inter-Community Medical Center
303 N. Third Avenue
Covina, CA 91723

NUCLEAR MEDICINE RESIDENCY-
July 1, 1991

The University of Tennessee Medical Center/Knoxville is offering two positions in a 2-year ACGME-approved program designed to provide competency in all aspects of Nuclear Medicine to meet the requirement of the American Board of Nuclear Medicine.

UTMCK is a 600-bed hospital and the regional referral center for East Tennessee. The Section of Nuclear Medicine is part of the Department of Radiology, a comprehensive diagnostic imaging center with x-ray radiography, CT, MRI and clinical PET. The Nuclear Medicine Section performs 6000 conventional imaging procedures, 21,000 RIAs and more than 1000 clinical PET studies per year. The program includes extensive training in conventional procedures, nuclear cardiology, SPECT imaging, PET and therapy with radionuclides. The Nuclear Medicine Section is equipped with an up-to-date image processing laboratory and the entire department is interconnected through an ethernet communication system.

Special research opportunities are being offered in cardiology, oncology and neurology. Applicants should have 2 years of ACGME-approved training in internal medicine, pediatrics, pathology or radiology. Send applications and CV to:
Karl F. Hubner, MD
Chief, Nuclear Medicine

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Nuclear Medicine Technologists

Hahnemann University, a 616-bed university teaching hospital, is seeking full-time staff technologists for the departments of:

- Nuclear Cardiology
- Radiation Oncology

Candidates must be CNMT or ARRT qualified/registry eligible.

We offer state-of-the-art equipment. Experience helpful, but not necessary. We have competitive wages, an outstanding flexible benefit program, and an educational assistance program. For further information, please contact or send resume to: Susan Levin, Human Resources, Hahnemann University, Mall Stop 605, Broad & Vine, Philadelphia, PA 19102-1191 (215) 448-7114.

Hahnemann University
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Chief Nuclear Medicine Technologist

The Genesee Hospital, a 421-bed university-affiliated teaching hospital, has two full-time career opportunities for Nuclear Medicine Technologists. Individuals will be dealing with a wide variety of diagnostic procedures which include cardiac imaging using state-of-the-art equipment. Previous experience with SPECT is highly desirable. Candidates must be registered or eligible; supervisory experience preferred for the Chief position.

We offer an excellent salary and benefits package as well as the opportunity for professional growth. Interested candidates may apply to: Department of Employee Affairs, 224 Alexander Street, Rochester, NY 14607. An Equal Opportunity Employer M/F.

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We are looking for self-motivated technologists with backgrounds in general imaging, nuclear cardiology, pediatric imaging, radiopharmacy and SPECT; NMTCB certification or registry eligibility is preferred.

So if you’re ready for a challenging career move, call us at 1-800-395-4343 or write to us at: Samaritan Health Services, Personnel, 1441 N. 12th St., Phoenix, AZ 85006.

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THE MILTON S. HERSHEY MEDICAL CENTER

FACULTY POSITION IN NUCLEAR MEDICINE

The Division of Nuclear Medicine of the Department of Radiology at the Penn State University's Milton S. Hershey Medical Center is recruiting a physician with board certification in Nuclear Medicine (ABNM) for a full-time academic position. Board certification in Diagnostic Radiology (ABR) is desirable but not essential.

Penn State University Hospital is a 350-bed tertiary care facility (currently expanding to 500 beds) in Hershey, Pennsylvania, near Harrisburg, the State Capitol. Nuclear Medicine is a division of the Department of Radiology which has an academic faculty of twenty physicians and six Ph.D.s. The Nuclear Medicine Division currently performs 5000 exams per year, expected to rise further as renovations and expansion are completed in subsequent years. There are currently five gamma cameras and a Hologic QDR 1000W bone density unit in place with one additional camera being added in 1991 or 1992. Four or five of the six will be tomographic.

Areas of emphasis currently include cardiac and pediatric nuclear medicine. An interest in neuroradiologic medicine and brain tomography would be desirable but not essential. An interest in clinical and/or basic research is desirable.

Applicants should respond as soon as possible with a letter of interest and current curriculum vitae. Please direct inquiries to:

Douglas F. Eggli, M.D., Chief Division of Nuclear Medicine Department of Radiology Penn State University/Hershey Medical Center P. O. Box 850, Hershey, PA 17033

Penn State University is an affirmative action, equal opportunity employer. Women and minorities are encouraged to apply.

TECHNOLOGIST JOB NETWORK

The New England Chapter-SNM/TS announces "The Job Hotline," a national toll-free, hotline for nuclear medicine. The hotline is designed to provide a quick link for technologists seeking jobs and for hospitals seeking technologists. Institutions seeking technologists should call the hotline number, leave the name of the institution, title of the job opening, and name and number of the contact person; data are then stored for three months in a database for anyone who calls the hotline. Technologists seeking employment should call the hotline number, specify state(s) which are of interest, specify type of job desired, and leave name and address. A listing will then be sent out in 48 hours; all inquiries are kept confidential. If an opening has not been filled within three months, the institution should call again to have it listed. The institution should also call if an opening has been filled so that it can be deleted from the database. The hotline numbers are 1-800-562-6387 (1-800-JOB-NETS) or 1-990-4212 In Maine. Questions or comments should be directed to: Tom Starno, Manager, Job Hotline, New England Chapter-TS at (207) 945-7186.

The Mideastern Chapter-SNM/TS will provide a referral network for technologists seeking employment and for hospitals in need of technologists. Interested individuals should call Cathy Gonzalez at (301) 855-1712. Please leave your name, address, phone number and a brief description of your request.

NOTE: SNM chapters are invited to submit job referral service listings for publication. Pertinent information—name and brief description of the service, telephone number and/or address, name or number of contact person for inquiries—should be sent to:

Joan Hiam, Section Editor, JNMMNMT The Society of Nuclear Medicine, 136 Madison Avenue New York, NY 10016-5760.
RADIATION SAFETY OFFICER

As a vital part of our Department of Environmental Health and Safety, you will operate and supervise our radiation protection program for our medical school, research laboratories and associated hospital. Assure compliance with all applicable rules and regulations (i.e. NYC Department of Health Articles 75, NYSDEC, USDOT and USNRC), conduct quarterly inspections and survey of laboratories; conduct worker training; conduct all surveys, and checks for ionizing and non-ionizing radiation equipment; and be responsible for quality assurance for x-ray units for affiliated hospitals.

The successful candidate will have a minimum of 5 years experience supervising a radiation protection program in a medical/research institution or comparable experience. A master's degree in radiation protection or occupational health and certification in health physics is recommended.

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Send resume, indicating desired position and salary requirements, to: Donna Modafferi, Personnel Dept, AECOM, Jack and Pearl Resnick Campus, 1300 Morris Park Ave, Bronx, NY 10461. EOE.

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We offer an excellent salary and benefits program. For more information contact Sandi Jackson, Recruiting Specialist, or send resume to:

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1-800-426-6677 (ext 2102) outside NC

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SPONSORSHIP:
This program is sponsored by the Medical College of Wisconsin.

TUITION:
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Nuclear Medicine Technologists who attend the SPECT Brain Imaging Clinical Fellowship are eligible for 1.0 VOICE credit.

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I will need hotel reservations for ___________________________ Sunday and Monday night/
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A check in the amount of $650 should accompany this registration form and be made payable to the Medical College of Wisconsin. Telephone registrations must be confirmed by check within 10 days.

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Registrations and payment should be sent to:
Lisa Ann Trembath
SPECT Brain Imaging Fellowship Coordinator
Nuclear Medicine Division
Medical College of Wisconsin
8700 W. Wisconsin Avenue
Milwaukee, WI 53226 (414)257-6068

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<td>Gilbert et al.</td>
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Rev. 8/90
Fundamentals of Nuclear Medicine

2nd Edition

Edited by
Naomi P. Alazraki, MD
and
Fred S. Mishkin, MD

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Glossary
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Fundamentals of Nuclear Medicine, 2nd Edition, provides physicians, physicians-in-training, scientists, and technologists with a comprehensive introduction to the basic principles of nuclear medicine, including the most recent advances in this fast-changing field.

Following the format of the acclaimed first edition, the editors have revised and expanded each chapter, adding major new sections on PET imaging, diagnostic decision making, parathyroid and adrenal imaging, and bone density measurement. In addition, several new scan images and graphs serve to illustrate the text.

Fundamentals of Nuclear Medicine fills the need for a current basic text to acquaint practitioners and students with the possibilities and limitations of nuclear medicine in detecting and evaluating common disorders. It is essential to all those who want an understanding of this rapidly evolving technology as it emerges from the investigative to the clinical stage.

To Order:

Single copies of Fundamentals of Nuclear Medicine, 2nd Edition, are available for $15.00 plus $2.50 postage and handling for each book ordered. Payment must be made in U.S. funds drawn on U.S. banks only. For payment made in U.S. funds, but drawn on a foreign bank, add a bank processing fee of $4.50 for Canadian bank drafts or $40.00 for all other foreign bank drafts. Check or purchase order must accompany all orders. Make checks payable to: The Society of Nuclear Medicine.

SPECIAL STUDENT OFFER: Bulk quantities of Fundamentals of Nuclear Medicine, 2nd Edition, are available for instructors to introduce medical and technologist students to nuclear medicine. Accredited instructors may purchase a minimum of 10 copies at $4.00 each (includes shipping).

The Society of Nuclear Medicine
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New Products

Each description of the products below was condensed from information supplied by the manufacturer. The reviews are published as a service to the professionals working in the field of nuclear medicine and their inclusion herein does not in any way imply an endorsement by the Editorial Board of The Journal of Nuclear Medicine or by The Society of Nuclear Medicine.

Moldable Immobilizer/Positioner

Nuclear Associates has developed a patient positioning control system that holds patients without the time-consuming use of tapes and straps. The Calergo Immobilizer/Positioner is a tough, lightweight, plastic mattress that is loosely filled with radiolucent polystyrene beads. The patient is wrapped in the mattress, a vacuum source removes the air from the mattress, and the beads are drawn together, shaping the mattress to the body's contours. The patient is immobilized firmly but comfortably; there is absolutely no pressure on the body. It is ideal for children and geriatric patients who cannot remain still. The system only takes seconds to immobilize or release the patient and provides precise reproducible positioning. Calergo is available in a range of whole-body and partial-body sizes.

Martin Ratner, Nuclear Associates, A Division of Victoreen, Inc., 100 Voice Road, Carle Place, NY 11514. (516) 741-6360.

Circle Reader Service No. 101

Disposable Filter Capsules

Nalge Company introduces Nalgene disposable filter capsules, available in 5- and 10-liter sizes. They are designed for single-use positive pressure filtration of tissue culture media and other aqueous solutions. Positive pressure filtration prevents foaming and protein denaturation. The capsules have cellulose acetate membranes, which are low in extractables and exhibit low protein binding. The capsules feature patented stacks of specially designed membranes and support plates that yield compact units with large filtration areas. A patented vent design allows controlled venting of trapped air before filtration to prevent membrane blockage and increase fluid flow. The pre-sterilized capsules have a filtering capacity of one to ten liters, depending on the size of the capsule and type of solution filtered. These compact capsules are certified to be noncytotoxic, nonpyrogenic, and 100% integrity tested.

Jorge M. Pardo, Marketing Communications, Nalge Company, A subsidiary of Sybron Corporation, 75 Panorama Creek Drive, Box 20365, Rochester, NY 14602. (716) 586-8800.

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Fiber Optic Back Pointer

Gammex, Inc. has introduced a fiber optic back pointer that is used in conjunction with wall-mounted patient alignment systems. Wall-mounted lasers project transverse beams of laser light that surround the patient. These light planes, combined with the light plane produced by the fiber optic back pointer, create an intersection defining the radiation exit axis. This is crucial for any tangential treatments. With its fine bright line, the fiber optic back pointer defines the axis of the radiation source as well as the isocenter, regardless of gantry orientation. Because the patient alignment is so precise, positioning time is decreased allowing for greater patient throughput. The resulting preciseness of the patient positioning prevents harm to healthy tissue.

The laser light of the back pointer is transmitted through a flexible fiber optic cable to a compact projection head that is easily mounted on or in the radiation therapy unit. Clearance is never a problem because of the small size of the output head. The cable and optical heads carry no electrical power and will not interfere with other equipment. The pointer can be adapted for use on all therapy equipment with or without retractable beam stoppers. The fiber optic back pointer can be added to any installed laser system. The resulting upgrade provides the most accurate patient positioning possible. Gammex Lasers, Inc., P.O. Box 26708, Milwaukee, WI 53226. (414) 258-1333 or (800) 426-6391.

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New Power Ratings for UPS Line

Sola has added 900, 1300, and 1800 VA power ratings to its Sidekick Uninterruptible Power System (UPS) product line. When operating under AC line, they provide excellent noise and surge protection. If the incoming voltage falls below 102 VAC, the inverter instantly switches on, allowing the protected system to continue operation. The new Sidekicks feature sinusoidal output to handle multiple loads at higher power levels and the microprocessor design assures high reliability and performance.

Sola, A Unit of General Signal, 1717 Busse Road, Elk Grove Village, IL 60007. (708) 439-2800.

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**Rectilinear Thyroid Scanner**

Atomic Products introduces the Atomlab Rectilinear Thyroid Scanner, a scanner that is state-of-the-art in thyroid uptake and scan procedures. Employing a rectilinear scan pattern, the device produces a 1:1 image ratio not readily accomplished on traditional gamma cameras. This true image is projected on a color monitor with a variety of format options, including film and laser black & white and color printouts. A built-in quality assurance program guides the user through the daily calibration and spectrum routines and can be programmed to print all stored data for compliance with regulatory agencies. Uptake information is calculated and stored along with gland mass measurement and region of interest identification. Fiber optic lights allow for immediate marker notation and labeling either during patient set-up or on the report format. The extensive database stores over 500 studies with each patient's scan selectively held in one file. The small space requirement makes the scanner a useful addition in a clinic or office environment.

**Medical Image Display System**

Vortech Data, Inc. announces the availability of the Personal Display System™ (PDS), a computer/software package for displaying diagnostic quality medical images. PDS combines high performance and a low price with the flexibility to customize the system for specific applications. The high performance system is built on the Apple® Macintosh® platform and is offered with a variety of software and hardware options.

New MRI Devices

Hitachi Medical Systems America, Inc. announces the introduction of two new magnetic resonance imaging (MRI) devices to the U.S. market. The MRP-5000, an enhanced version of the MRP-20, (Hitachi's 0.2 Tesla product), features Hitachi's HS/SMR coil technology for improved image quality plus additional options for increasing patient throughput. The MRP-7000 features a new 0.3 Tesla vertical field permanent magnet and a powerful new computer. The extremely efficient system operation and rapid imaging techniques allow throughput that rivals the more expansive high-field systems. Both systems continue to offer low operating costs and high reliability.

**Alpha Spectroscopy Software**

Canberra Nuclear Products Group announces AlphaWorks, a complete personal computer software package for alpha spectroscopy control and analysis. AlphaWorks is an extension of the existing ASP Alpha Spectroscopy Package. The new software controls the entire alpha spectroscopy process from starting counts to analyzing groups of spectra. Virtually any sample type can be analyzed including tracerless, tracer-based PERALS and Frisch Grid spectra. The software facilitates analysis of both well-separated peaks and multiplets. Regions of interest are automatically set up and calculated based on sample types. The user can add to or delete from peaks. Automation does not sacrifice the alpha spectroscopist's expert interpretation of the results. The new package allows users to calculate minimum detectable activities and will report negative results. Further, the report format can be edited. Upgrades from the ASP package to AlphaWorks are available.

Canberra Nuclear Products Group, One State Street, Meriden, CT 06450. (203) 238-2351. (800) 243-3955.

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Vortech Data, Inc., 10700 Parkridge Blvd., Reston, VA 22091. (703) 264-0020 or (800) 869-9998.

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FOR DIAGNOSTIC USE

DESCRIPTION
Each 5 mL reaction vial contains a sterile, nonpyrogenic, lyophilized formulation of 2.0 mg cyclohexanedione dioxime, 2.0 mg methyl boronic acid, 2.0 mg pentetic acid, 9.0 mg citric acid, anhydrous; 100 mg sodium chloride, 50 mg gamma cyclodextrin and 0.058 mg (maximum) total tin expressed as stannous chloride (SnCl₂), 0.020 mg (minimum) stannous chloride (SnCl₂). The pH is adjusted with sodium hydroxide and/or hydrochloric acid prior to lyophilization. The contents of the vial are lyophilized and sealed under nitrogen at the time of manufacture. No bacteriostatic preservative is present.

When sterile, pyrogen-free sodium pertechnetate Tc 99m injection is added to the vial, and the solution is heated at 100°C for 15 minutes, the diagnostic agent Technetium Tc 99m Teboroxime is formed for administration by intravenous injection. The pH of the reconstituted product is 3.7 (range 3.3 to 4.1).

INDICATIONS AND USAGE
Technetium Tc 99m Teboroxime is a myocardial perfusion agent that is useful in distinguishing normal from abnormal myocardium in patients with suspected coronary artery disease using rest and stress techniques.

CONTRAINDICATIONS
None known.

WARNINGS
Stress testing should be performed only under the supervision of a qualified physician and in a laboratory equipped with appropriate monitoring, resuscitation and support apparatus.

PRECAUTIONS
General
Contents of the reaction vial are intended only for use in the preparation of Technetium Tc 99m Teboroxime and are not to be administered directly to the patient.

Contents of the kit before preparation are not radioactive. However, after the addition of sodium pertechnetate Tc 99m injection, adequate shielding of the final preparation must be maintained.

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

The technetium Tc 99m labeling reactions involved in preparing the agent depend on maintaining the stannous ion in the reduced state. Any oxidant present in the sodium pertechnetate Tc-99m supply may thus adversely affect the quality of the radiopharmaceutical. Hence, sodium pertechnetate Tc-99m containing oxidants should not be employed.

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 radioactive material, care should be taken to minimize radiation exposure to the patient consistent with proper patient management and to ensure minimum radiation exposure to occupational workers.

Tc-99m Teboroxime should be formulated no more than 6 hours prior to clinical use.

Carcinogenesis, Mutagenesis, Impairment of Fertility
In comparison with most other diagnostic technetium labeled radiopharmaceuticals, the radiation dose to the ovaries (1.8 rads/50 mCi) is high. Minimal exposure (ALARA) is necessary in women of childbearing capability. (See Dosimetry subsection in DOSAGE and ADMINISTRATION section.)

No long-term animal studies have been performed to evaluate carcinogenic potential or to determine the effects of Cardiotec on fertility in males or females.

Three different mutagenicity assays (a reversion test with bacteria, a chromosomal aberration assay and an in vivo mouse micronucleus assay) conducted with cold (decayed) technetium labeled Cardiotec gave negative results.

Cardiotec was weakly positive for inducing forward mutations at the TK locus in LS178Y mouse lymphoma cells in the absence of metabolic activation (but only at high concentrations that were toxic to the cells and reduced growth to 33% or less relative to vehicle controls). Cardiotec was negative in this assay in the presence of metabolic activation.

Pregnancy Category C
Animal reproduction studies have not been conducted with Technetium Tc 99m Teboroxime. It is also not known whether Technetium Tc 99m Teboroxime can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. Technetium Tc 99m Teboroxime should be given to a pregnant woman only if the expected benefits to be gained clearly outweigh the potential hazards.

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

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

Pediatric Use
Safety and effectiveness in children below the age of 18 have not been established.

ADVERSE REACTIONS
Uncommon adverse reactions reported in clinical trials include metallic taste in mouth, burning at injection site, facial swelling, numbness of hand and arm, hypotension and nausea after administration of Technetium Tc 99m Teboroxime.

HOW SUPPLIED
Cardiotec® (Kit for the Preparation of Technetium Tc 99m Teboroxime) is supplied in kits of 5, 10, and 25 reaction vials. (J4-282A)

SQUIBB® Diagnostics
NEW! CardiocTeC®
(Kit for the Preparation of Technetium Tc 99m Tetroxine)
THE ONLY TECHNETIUM-BASED
AGENT FOR STRESS AND REST

QUICK...
Rapid uptake and washout: complete stress and rest studies in only 90 minutes!

CLEAR...
Sharp images: enhance diagnostic ability to distinguish ischemia and infarction!

CLEAN...
Rapid blood clearance: greater patient comfort.

The first technetium-based myocardial perfusion agent for rest and stress imaging.

NEW CardiocTeC®
(Kit for the Preparation of Technetium Tc 99m Tetroxine)

SQUIBB Diagnostics

Please see the brief summary of prescribing information for CardiocTeC on the adjacent page.
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