Radioiodine is trapped by the thyroid and organified in the synthesis of thyroxine.\textsuperscript{1,4} 99\textsuperscript{m}TcO\textsubscript{4}– is trapped, but not organified, by the thyroid. Consequently, Tc99m activity does not always indicate the physiologic condition of the thyroid.

Radioiodine clearly demonstrates the “cold” nonfunctioning nodules that may be associated with malignant thyroid tumors. Such nonfunctioning nodules have appeared “hot” or “cold” on images obtained with Tc99m, necessitating a confirmatory radioiodine scan.\textsuperscript{2,3}

Radioiodine thyroid imaging is preferred to Tc99m for investigation of patients with possible retrosternal thyroid tissue or in those patients whose images are unsatisfactory with Tc99m due to poor radionuclide concentration.\textsuperscript{4}

\textsuperscript{1Steinbach, HL, Kundy, D, Moss M, et al: A comparison of three agents in thyroid uptake and scintigraphy. Scientific Exhibit, Society of Nuclear Medicine, Philadelphia, June 16-20, 1975.}
\textsuperscript{2Arnold, J. et al: 99\textsuperscript{m}Tc-Pertechnetate Thyroid Scintigraphy in Patients Predisposed to Thyroid Neoplasms by Prior Radiotherapy to the Head and Neck. Radiology 115:653-657, June 1975.}
\textsuperscript{4Arnold, JE, Pinsky, S: Comparison of 99\textsuperscript{m}Tc and 123\textsuperscript{i} for Thyroid Imaging. J. Nucl. Med., 17:261, 1976.}
A female patient presented palpable nodes in the right side of the neck. A scan was performed with 20mCi of Technetium 99m (above left) which revealed an essentially normal scan. A 100µCi I 123 (above right) scan imaged a "cold" nodule in the lower right lobe of the thyroid and also imaged iodine concentrating tissue in the lymph nodes. The I 123 scan ruled out a diagnosis of lymphoma, but confirmed a diagnosis of thyroid carcinoma. Surgery revealed a follicular adenocarcinoma of the thyroid gland with extensive lymph node metastasis.
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“Tc-99m-MDP with ascorbate had a higher affinity for hydroxylapatite than did MDP without ascorbate.”

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Technetium Tc 99m Medronate Kit

BRIEF SUMMARY OF PRESCRIBING INFORMATION

indications and usage
Technetium Tc 99m Medronate may be used as a bone imaging agent to delineate areas of altered osteogenesis.

contraindications
None known.

warnings
This class of compound is known to complex cations such as calcium. Particular caution should be used with patients who have, or who may be predisposed to, hypocalcemia (i.e., alkalosis).

This radiopharmaceutical drug product should not be administered to children, to pregnant women, or to nursing mothers, unless the expected benefit to be gained outweighs the potential risk.

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

precautions

• general
Technetium Tc 99m Medronate as well as other radiopharmaceuticals, 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.

To minimize radiation dose to the bladder, the patient should be encouraged to void when the examination is completed and as often thereafter as possible for the next 4-6 hours.

This preparation contains no bacteriostatic preservative. Technetium Tc 99m Medronate should be formulated within six (6) hours prior to clinical use.

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

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

• pediatric use
Safety and effectiveness in children have not been established.

• adverse reactions
No adverse reactions specifically attributable to the use of Technetium Tc 99m Medronate have been reported.

how supplied
Union Carbide’s Technetium Tc 99m Medronate Kit is supplied as a sterile, pyrogen-free kit containing 5 vials.

Each 10 ml vial contains 10 mg medronic acid, 0.17 mg (minimum) stannous chloride (maximum stannous and stannic chloride 0.29 mg), and 2 mg ascorbic acid. The pH has been adjusted to 4-8 with either HCl or NaOH prior to lyophilization. Following lyophilization, the vials are sealed under a nitrogen atmosphere.

Product #17500502 Multidose vial shield with cap and retainer ring available separately.

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Adds up to a complete Xenon ventilation system

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The RADX Ventil-Con II, recognized worldwide as the leading Xenon rebreathing system, was the first to offer:
- Automatic O₂ replenishment
- In-line autoclavable bacteriological filter
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- Shielding equivalent to 1/8" lead
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The Ventil-Con design limits dead space to less than 25 ml, and has less than 0.2 in/H₂O resistance to normal breathing. Xenon trap with exhaust port detector/alarm is built in.

Now RADX is the first to develop the Vent-Al an accessory for the Ventil-Con, for performing Xenon studies on respirator patients. The Vent-Al may be field installed on any Ventil-Con or factory installed in a Xena-Con. Vent-Al provides electronically variable breaths/minute and breathing volumes.

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Ruth High
(12 years experience)
My department visually verifies the results of the automated reader to assure that the readings on every film are highly accurate.

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Well tolerated by patients, it provides excellent images

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For orders call:
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(In Missouri, 314-895-2405 collect)

See brief summary on following page.

THE MALLINCKRODT COMMITMENT to Nuclear Medicine

MALLINCKRODT, INC., Post Office Box 5840, St. Louis, MO 63134
CONTRAINDICATIONS

Elimination

0.5 activity per mg of Tc-99m albumin. Technetium Tc-99m albumin preparations should not be administered to persons under the age of 18, to pregnant women or to nursing mothers unless the expected benefits are gained outweigh the potential risks.

The risk of hypersensitivity reaction in nature, of women of childbearing capability should be performed during the first few (approximately 10) days following the onset of menstruation.

PRECAUTIONS

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

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

The labeling reactions involved in preparing Technecium Tc-99m MAA kit 99mTc may result in the final contents adequately before use may result in a non-homogenous suspension with a resulting non-uniform distribution of radioactivity in the lung. It is also recommended that the early probability of aging with a batch of Technecium Tc-99m albumin aggregated preparation may not be used after eight hours from the time of reconstitution.

The contents of the vial are under a nitrogen atmosphere and should be protected from any air. During storage with pertechnetate Tc-99m, the contents of the vial may be mixed by gentle swirling to avoid changes in particle size.

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

ADVERSE REACTIONS

The literature contains reports of deaths occurring after the administration of aggregated albumin patients with pre-existing severe pulmonarv conditions. Instances of hemodynamic or ischemic reactions to preparation of technetium Tc-99m albumin aggregated injection have been reported.

Hypersensitivity reactions are possible whenever protein-containing materials such as technetium Tc-99m albumin aggregated injection are used in mammalian, amphibian, and avian and/or constrictor agents should be available for use.

DOSE AND ADMINISTRATION

The recommended intravenous dose range for the average patient (70 kg) is 1 to 4 milliliters. The volume of the dose may vary from 0.1 to 0.6 milliliters.

The recommended number of aggregated albumin particles to be administered per dose is 200,000 to 300,000,000,000.

NOTE: When large milliliter size generators are used, the eluate (yielding 3 to 4 mCi) should be diluted to 100 milliliters or less with normal saline.

Before use, such eluates should be diluted with sterile, non-pyrogenic saline to ensure that at least 0.1 mCi of sodium pertechnetate Tc-99m solution is added to each reaction vial.

The number of particles available per milliliter dose of Technecium Tc-99m MAA varies corresponding to the physical decay of technetium Tc-99m while it has the particles available in any specific dose may be estimated from the following table.

PARTICLES/DOSE x 10^6

(X = 8 x 10^8 PARTICLES/VIAL)

<table>
<thead>
<tr>
<th>mCi Tc-99m</th>
<th>added dose</th>
<th>1 mCi</th>
<th>2 mCi</th>
<th>3 mCi</th>
<th>4 mCi</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0.40</td>
<td>0.80</td>
<td>1.20</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>0.27</td>
<td>0.54</td>
<td>0.81</td>
<td>1.08</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>0.16</td>
<td>0.32</td>
<td>0.48</td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>0.13</td>
<td>0.26</td>
<td>0.39</td>
<td>0.52</td>
<td></td>
</tr>
</tbody>
</table>

*The particles per milliliter dose will increase in relation to the physical decay of Tc-99m such that at six hours (one half-life) after preparation, the values in the table will increase by a factor of two.

Dosages in right-to-left cardiac shunt the number of aggregated albumin particles administered per dose should be reduced to the minimum feasible.

The patient should be monitored by a suitable radioactivity calibration system for total radioactivity immediately prior to administration. It is also recommended that the radiological purity be checked for any signs of contamination. Residual particles by repeated inversion of the system immediately prior to injection Technecium Tc-99m MAA kit may be injected intravenously without aspirating, over a 20 to 30-second interval with the patient in the supine position. If blood is driven into the system, any unnecessary delay prior to injection may lead to clotted formation in the system. Do not flush the system before or during administration. For optimum results, lung imaging should begin as soon as possible after injection. The Technecium Tc-99m MAA kit may not be injected through intravenous tubing because of the occasional observation of 'hot spots' in the lung.

Radiation Dosimetry

The estimated absorbed radiation doses from an intravenous injection of 6 mCi (225 MBq) Technetium Tc-99m MAA is shown in Table 4.

Table 4. Absorbed Radiation Dose

<table>
<thead>
<tr>
<th>Tissue</th>
<th>(abs/IV mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lungs</td>
<td>1.044</td>
</tr>
<tr>
<td>Liver</td>
<td>0.116</td>
</tr>
<tr>
<td>Spleen</td>
<td>0.012</td>
</tr>
<tr>
<td>Kidneys</td>
<td>0.252</td>
</tr>
<tr>
<td>Throat</td>
<td>0.032</td>
</tr>
<tr>
<td>Radiation</td>
<td>0.544</td>
</tr>
<tr>
<td>Ovary</td>
<td>0.306</td>
</tr>
<tr>
<td>Testis</td>
<td>0.028</td>
</tr>
<tr>
<td>Total Body</td>
<td>0.048</td>
</tr>
</tbody>
</table>

Table 5. Method of Calculation: A Schema for Absorbed Dose Calculations for Xenon-135 Negative Distributed Radionuclides, Supplement No. 1 to MIRD Pamphlet No. 10 (1968)

HOW SUPPLIED

Technecium Tc-99m MAA Kit

Catalog No. 503

Kit Contains:

- 3 Injection Vials for the preparation of Technecium Tc-99m Albumin Aggregated Injection

<table>
<thead>
<tr>
<th>Vial Contents</th>
<th>(Microcuries of Technecium Tc-99m MAA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vial 1</td>
<td>2.0 mg Aggregated Albumin</td>
</tr>
<tr>
<td>Vial 2</td>
<td>0.5 mg Albumin</td>
</tr>
<tr>
<td>Vial 3</td>
<td>120 μg Stammmium Chloride (Dehydrate)</td>
</tr>
</tbody>
</table>

Hydrochloric Acid or Sodium Hydroxide is added for adjustment. Each Vial contains 0.1 to 3.0 microcuries of Technecium Tc-99m MAA contains no preservatives, after reconstitution it should be stored at +5°C in the refrigerator. Each package included in each package is one (1) package insert and 5 radioactivity information tabs.

DIRECTIONS

Procedures:

SOLUTIONS OF SODIUM PERTECHNETATE Tc-99m Which CONTAIN OXIDIZING AGENTS (i.e., sodium hypochlorite or hydrogen peroxide) SHOULDN'T BE USED.

Solutions obtained from the following technetium-99m generators will be obtained and found to be acceptable for use with Technecium Tc-99m MAA kit 99mTc Ultra-Technecke Generator. New England Nuclear's Techetium Generator and Sportiv's Minitec' Generator are acceptable solutions of technetium-99m. Experience has demonstrated that they are compatible with Technecium Tc-99m MAA kit.

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

PROCEDURE

NOTE: The radioactive material should be shielded at all times during preparation.

1. Allow a 'cooling' period of 15-20 minutes after the radioactive material is removed from the refrigerator and approximately 5 minutes are allowed for the contents to come to room temperature.

2. After “cooling” — Radioactive Material! long tubing to reaction vial. Using a Pasteur pipette, add a total shield filled with a lid and having a wall thickness of at least 0.1 mm. Do not remove reaction vial from shield before it is exposed to laboratorv or other personnel. Use adequate shielding to perform the injection.

4. Sodium pertechnetate Tc-99m solution (5-10 mCi) is added to the Technecium Tc-99m MAA, in choosing a convenient technique, Technecium Tc-99m MAA is prepared for intravenous administration, and radioactivity decay must be taken into account. The recommended maximum amount of technetium Tc-99m to be added to the Technecium Tc-99m MAA is 60 milliliters. The user has demonstrated that they are compatible with Technecium Tc-99m MAA kit.

5. The reaction vial is gently agitated for a few seconds and allowed to sit for 5-10 minutes.

6. Calculate the radioactivity concentration of the Technecium Tc-99m MAA kit and fill in the appropriate information on the string tag.

Pulse radiography, the difference in the reaction vial should be gently agitation sufficient to effect homogenous suspension of the final dose. The Technecium Tc-99m MAA kit should be used for vascular injection at "2° to "1°C" when not in use and discard after 8 hours from the time of recombination.

This reagent kit is approved for use by persons licensed by the U.S. Nuclear Regulatory Commission pursuant to Sections 35.14 and 35.100 Group III of "40 CFR 35" or under licenses of Agreement States.

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St. Louis, MO 63134
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(Technetium Tc 99m)
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Easy to operate
— After a few simple preparations, Minitec elutes automatically and quickly. Subsequent elutions are even simpler. — Small-volume, high-concentration eluates give maximum flexibility for varying applications.

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— Express ground transportation and special air system assure on-time deliveries.

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— Specially trained Technical Associates and Squibb Technical Customer Service provide prompt personal attention when needed.

See next page for brief summary.

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— Saturday-calibrated generators delivered Monday a.m.

See us at the SNM show in Las Vegas at Island E
MINITEC®
Technetium Tc 99m
GENERATOR

DESCRIPTION: Minitec (Technetium Tc 99m) Generator consists of a specially designed lead-shielded alumina column containing adsorbed fission-produced Mo 99. Tc 99m, the short-lived daughter of Mo 99, is obtained as sterile sodium pertechnetate Tc 99m by periodic elutions of the generator with an isotonic saline solution.

INDICATIONS AND USAGE: Sodium pertechnetate Tc 99m is indicated in ADULTS as an agent for brain imaging including cerebral radionuclide angiography, thyroid imaging, salivary gland imaging, placenta localization, and blood pool imaging including radionuclide angiography. (For use of sodium pertechnetate Tc 99m as a diagnostic radiopharmaceutical in CHILDREN, consult package insert.)

CONTRAINDICATIONS: None known.

WARNINGS: Radionuclides should not be administered to patients who are pregnant or to nursing mothers unless the expected benefit to be gained outweighs the potential hazards.

Since sodium pertechnetate Tc 99m is excreted in human milk during lactation, formula-feedings should be substituted for breast-feedings.

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.

Radiation risks associated with the use of sodium pertechnetate Tc 99m are greater in children than in adults and, 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 children.

IMPORTANT: Since material obtained from the generator may be intended for intravenous administration, aseptic technique must be strictly observed in all handling. Only the eluent provided should be used to elute the generator. Do not administer material eluted from the generator if there is any evidence of foreign matter.

PRECAUTIONS: In the use of any radioactive material, care should be taken to insure minimum radiation exposure to the patient and occupational workers consistent with proper patient management. At the time of administration the solution should be crystal clear.

ADVERSE REACTIONS: No adverse reactions specifically attributable to the use of sodium pertechnetate Tc 99m have been reported.

For full prescribing information, consult package insert.

HOW SUPPLIED: Minitec (Technetium Tc 99m) Generator is available in potencies of 220, 440, 880, 1330, 1770, or 2220 millicuries Mo 99 at calibration time. The generator is supplied with vials of sterile, nonpyrogenic eluent; a sterile needle adapter assembly and evacuated sterile collecting vials. Other accessories including lead shields, reference standard solutions, and a whole vial assay kit are available on request for use with the Minitec (Technetium Tc 99m) Generator.

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5 Includes 2 pamphlets: "Distribution of absorbed dose around point sources of electrons and beta particles in water and other media"; and "Absorbed fractions for small volumes containing photon-emitting radioactivity." ($1.50)
6 Includes pamphlet 9: "Radiation dose to humans from "Se-75." ($1.00)

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All available MIRD pamphlets and supplements for only $25.00 plus $4.00 for shipping and handling.

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<tr>
<td>1 ($5.25)</td>
<td>3 ($1.50)</td>
<td>$25.00 plus</td>
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A superior new bone scanning agent

Osteoscan-HDP represents a significant technological advance in bone scanning agents. Its unique new active ingredient, hydroxymethylene diphosphonate (HDP), provides higher bone uptake than MDP-based agents for clear, definitive scans and excellent lesion detection.

Bone uptake superior to MDP
HDP shows unusually high adsorption to bone. In a clinical comparison, Osteoscan-HDP averaged 21% higher bone uptake than the MDP-based agent.¹

Rapid blood clearance
No bone agent clears the blood faster. Only 6% of Osteoscan-HDP remains in the blood two hours after injection.² Osteoscan-HDP’s rapid blood clearance contributes to the overall quality of the image and permits flexibility in scheduling patient scans from 1 to 4 hours post-injection.

Scan data:
The two scans above are of a 52-year-old female patient with lower back pain. Scan: normal. Instrument: GE MaxiCamera™ 61; information density: 600 counts/cm²; dose 20 mCi; dose to image time: 3.5 hr.

References:
Unexcelled image quality³
Osteoscan-HDP's high bone uptake and rapid blood clearance permit clear visualization of skeletal detail even in difficult-to-scan elderly patients.

See for yourself
To order Osteoscan-HDP, or for further information, call or write Procter & Gamble, Professional Services, P.O. Box 85507, Cincinnati, Ohio 45201, (513) 977-5547.

High lesion sensitivity
HDP offers a high tumor-to-normal bone ratio. This results in high resolution scans capable of demonstrating subtle skeletal metastases and fractures with no sacrifice in overall image quality.

Scan data:
The two scans above are of a 59-year-old female patient with breast cancer. Scan: abnormal deposits of radionuclide present in dorsal and lumbosacral spine. Instrument: GE MaxiCamera™ 535; counts: 2000K; dose 20.1 mCi; dose to image time: 3 hr.

Please see the following page for a brief summary of prescribing information.
NUCLEAR MEDICINE REVIEW SYLLABUS
Peter T. Kirchner, M.D., Editor

The rapid growth of clinical nuclear medicine poses a formidable challenge to the physician who wants to maintain a high level of competence in all areas of nuclear medicine. To help the physician meet this challenge, the Society of Nuclear Medicine has prepared the NUCLEAR MEDICINE REVIEW SYLLABUS, a comprehensive review of the major scientific and clinical advances that have occurred since the early 1970's.

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The NUCLEAR MEDICINE REVIEW SYLLABUS has chapters on:
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- Gastroenterology
- Instrumentation
- Genito-Urinary System
- Radiation Effects and Hematology-Oncology
- Radiation Protection
- Pulmonary
- Cardiovascular
- Radioisotopes
- Central Nervous System
- Skeletal System
- Endocrinology

This highly readable guide to current practice was prepared by more than fifty recognized authorities, with each chapter written by acknowledged experts in the field.

The NUCLEAR MEDICINE REVIEW SYLLABUS will prove valuable to the practicing physician who wants to keep in touch with current clinical practice in all aspects of nuclear medicine. Those seeking certification will find the SYLLABUS extremely useful as a tool for final review.

Copies are available now at $30.00 each (plus $2.50 per copy for postage and handling). All orders must be prepaid or accompanied by a purchase order. Checks must be in U.S. funds only. Order from: Book Order Dept., Society of Nuclear Medicine, 475 Park Avenue South, New York, NY 10016.

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INDICATIONS AND USAGE
OSTEOSCAN-HDP (Technetium Tc99m Oxidronate Kit) is a diagnostic skeletal imaging agent used to demonstrate areas of altered osteogenesis.

CLINICAL PHARMACOLOGY
During the 24 hours following injection, Technetium Tc99m-labeled OSTEOSCAN-HDP is rapidly cleared from blood and other non-osseous tissues and accumulates in the skeleton and urine. In humans, blood levels are about 10% of the injected dose at one hour post-injection and continue to fall to about 6%, 4% and 3% at 2, 3 and 4 hours respectively. When measured at 24 hours following its administration, skeletal retention is approximately 50% of the injected dose. OSTEOSCAN-HDP exhibits its greatest affinity for areas of altered osteogenesis and actively metabolizing bone.

CONTRAINDICATIONS
None known.

WARNINGS
This class of compounds is known to complex cations such as calcium. Particular caution should be used with patients who have, or who may be predisposed to hypocalcemia (i.e., alkalosis).

PRECAUTIONS
General
Contents of the vial are intended only for use in the preparation of Technetium Tc99m Oxidronate and are NOT to be administered directly to the patient. Technetium Tc99m Oxidronate should be formulated within eight (8) hours prior to clinical use. Optimal imaging results are obtained one to four hours after administration. Technetium Tc99m Oxidronate as well as other radioactive drugs, must be handled with care, and appropriate safety measures should be used to minimize radiation exposure to the patients consistent with proper patient management. Radiopharmaceuticals should be used only by physicians who are qualified by specific training 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.

To minimize radiation dose to the bladder, the patients should be encouraged to drink fluids and to void immediately before the examination and as often thereafter as possible for the next four to six hours.

Carcinogenesis, Mutagenesis, Impairment of Fertility
No long-term animal studies have been performed to evaluate carcinogenic potential or whether Technetium Tc99m Oxidronate affects fertility in males and females.

Pregnancy — Category C
Animal reproduction studies have not been conducted with Technetium Tc99m Oxidronate. It is also not known whether Technetium Tc99m Oxidronate can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Technetium Tc99m Oxidronate 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 capacity should be performed during the first few (approximately 10) days following the onset of menses.

Nursing Mothers
Technetium Tc99m is excreted in human milk during lactation, therefore formula feedings should be substituted for breast feedings.

Pediatric Use
Safety and effectiveness in children have not been established.

ADVERSE REACTIONS
Although adverse reactions have not been reported that are specifically attributable to the use of Technetium Tc99m Oxidronate, allergic dermatological manifestations (erythema) have been infrequently reported with similar agents.

DOSEAGE AND ADMINISTRATION
General Instructions
The recommended adult dose of Technetium Tc99m-labeled OSTEOSCAN-HDP is 1 to 2 mCi with a range of 10 to 20 mCi. The activity of each dose should be measured by a suitable radiation calibration system just prior to administration. The dose should be given intravenously by slow injection. For optimal results imaging should be done 1-4 hours post-injection.

HOW SUPPLIED
OSTEOSCAN-HDP is supplied as a lyophilized powder packaged in vials. Each vial contains 2.0 mg oxidronate sodium and 0.15 mg stannous chloride as active ingredients, and 0.56 mg gentamic acid as a stabilizer. Kits containing 5 or 30 vials are available. The NDC number for this product is NDC 37000-403-01. The drug can be stored at room temperature both prior to and following reconstitution with ADDITIVE-FREE sodium pertechnetate Tc99m.

For additional product information, call (513) 977-5547 or write: Procter & Gamble, Professional Services, P.O. Box 171, Cincinnati, OH 45201.
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Quick-change elution needle reduces risk of contamination for greater patient safety.

A fresh needle every time you elute helps insure sterility. Mallinckrodt generators have a unique, quick-change system that makes it easy. Each generator comes with 6 sterile-packed, pyrogen-free needles. After eluting, just remove the old needle and insert the new, leaving the protective cap in place. That way, your generator is always ready to supply sterile eluate. And if a needle is damaged, you can change it in seconds...no waiting for a whole new needle assembly to be delivered and installed, no disruption of your schedule.

For more information, call your Mallinckrodt representative or this toll-free number:

800-325-3688 (In Missouri, 314-344-3880 collect)
For technical assistance it's 800-325-5181
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For technical assistance it's 800-325-8181
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THE

MALLINCKRODT COMMITMENT

to Nuclear Medicine

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Xenon

Xenon Xe 133

How you like it
When you like it
MPI Xenon Xe 133 is now available in four product configurations—from unit dose to bulk:

- Ventilation Study System (V.S.S.)
- 10 mCi vials
- 20 mCi vials
- 1.3-1.7 Ci ampules (crushable and breaksealed)

MPI Xenon Xe 133 delivery and calibration schedule—utmost convenience and optimal product use:

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<td>V.S.S.</td>
<td>Monday</td>
<td>Thursday</td>
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<tr>
<td>10 &amp; 20 mCi vials</td>
<td>Monday</td>
<td>Thursday</td>
</tr>
<tr>
<td>1.3-1.7 Ci Ampules</td>
<td>Monday</td>
<td>Prior Friday</td>
</tr>
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</table>

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

**Xenon Xe 133-V.S.S.** For the study of pulmonary ventilation.

**Xenon Xe 133 Gas Ampule & MPI Xenon Xe 133 Gas Vial.** For the study of pulmonary ventilation and assessment of cerebral blood flow.

**DESCRIPTION:** The Xenon Xe 133-Ventilation Study System consists of a sealed frangible capsule containing 10 millicuries; 20% of Xenon Xe 133 gas at calibration time and date with less than 1% carrier xenon in air. Xenon Xe 133 Gas vials is supplied as a carrier-free gas in concentrations of 10 to 50 mCi/ml, per milliliter of gas for inhalation. Xenon Xe 133 Gas Ampeule is supplied as a carrier-free gas in 4 ml crushable or break-sealed glass ampule in concentrations of 0.43 to 0.33 Curie/ml. Xenon Xe 133 is produced by fission of Uranium-235. It is chemically and physiologically related to elemental xenon, a non-radioactive monoatomic gas which is physiologically inert except for anesthetic properties as high doses.

**CONTRAINDICATIONS:** None known.

**WARNINGS:** Xenon Xe 133 should not be administered to children or to patients who are pregnant, or to nursing mothers unless the benefits to be gained outweigh the potential hazards. Ideally, examinations using radio-pharmaceuticals, 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. Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus.

There are no well-controlled studies in pregnant women which allow any conclusions as to the safety of Xenon Xe 133 for the fetus. Xenon Xe 133 should be used in pregnant women only when clearly needed.

Concentrated Xenon Xe 133 gas supplied in ampule must be diluted to the activity range appropriate to the route of administration.

**PRECAUTIONS:** Xenon Xe 133 gas as well as other 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. Exhaled Xenon Xe 133 gas should be controlled in a manner that is in compliance with the appropriate regulations of the government agency authorized to license the use of radionuclides. Xenon Xe 133 gas delivery systems, i.e., respirators or spirometers, and associated tubing assemblies must be leakproof to avoid loss of radioactivity into the laboratory environment specifically protected by exhaust systems. Xenon Xe 133 adheres to some plastics and rubber and should not be allowed to stand in tubing or respirator containers for such unrecognized loss of radioactivity from the dose for administration may render the study non-diagnostic.

**ADVERSE REACTIONS:** Adverse reactions specifically attributable to Xenon Xe 133 have not been reported.

**HOW SUPPLIED:** Each Ventilation Study System (V.S.S.) contains Xenon Xe 133 in a sealed frangible capsule containing 10 millicuries 20% at calibration time and date stated on the label. Each Xenon Xe 133 Gas ampule is supplied in 4 ml crushable or break-sealed ampules containing 1.7 to 1.3 Curies. Each Xenon Xe 133 Gas vial contains 10 or 20 mCi of gas.

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Volume 22, Number 5 41A
The newspaper of nuclear medicine —

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The finest R-wave Triggering device available for computerized gated cardiac studies.

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- Trigger Pulse LED
- Unlimited Heart Rate Capability
- Trigger Control
- Digital CRT Monitor
- ONE YEAR WARRANTY

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- Computer is gated only on the R-Wave. High amplitude T-waves are ignored.
- Provides permanent record of patient ECG. Insures proper lead placement.
- Indicates R-R Interval or Heart Rate during stress studies.
- Monitors presence of output signals to the computer.
- Both Heart Rate display and R-trigger pulses have unlimited tracking capability during stress studies.
- Provides desired setting of R-wave amplitude discrimination.
- Visual monitoring of ECG and R-wave trigger.
- ONE YEAR WARRANTY

MODEL

AccuSync-V

R-Trigger pulse output, ECG output, Heart Rate/ R-R int., Strip Chart Recorder, Digital CRT Monitor and Isolation Amplifier for patient safety.

AccuSync-I

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NEW...BRH Test Pattern
Allows comprehensive evaluation of gamma camera performance

A single transmission image of this new test pattern provides precise data for any gamma camera's

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- Field Uniformity
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See the article entitled "BRH Test Pattern for the Evaluation of Gamma Camera Performance", by Peter Paras, Gerald J. Hine and Ralph Adams, in this issue of the Journal of Nuclear Medicine.

VICTOREEN
NUCLEAR ASSOCIATES
(516) 741-6360
Diagnosis: normal ventilation, abnormal perfusion — pulmonary embolism

Imaging information:
- Instrument: Picker Model 4/15 Gamma Camera
- Dose: 15 mCi Xenon 133; 3 mCi PULMOLITE
- Information density: 1,000 counts/cm²; 2,000 counts/cm²

Xenon Xe 133 Gas (CALIDOSE™) Dispensing System
PULMOLITE™
- Technetium Tc 99m Aggregated Albumin Kit

Please see following page for brief prescribing information.

SEE US AT THE SNM SHOW IN LAS VEGAS AT ISLAND "K"
**INDICATIONS:** Inhalation of xenon Xe 133 gas has proved valuable for the evaluation of pulmonary function and for imaging the lungs. It may also be applied to assessment of cerebral flow.

**CONTRAINDICATIONS:** To date, no known contraindications to the use of xenon Xe 133 gas have been reported.

**WARNINGS:** This radiopharmaceutical should not be administered to pregnant or lactating women unless the benefits to be gained outweigh the potential hazards.

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

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

**PRECAUTIONS:** As in the use of any other radioactive material care should be taken to insure minimum radiation exposure to the patient, consistent with proper patient management, and to insure minimum radiation exposure to occupational workers. Expired xenon Xe 133 gas should be controlled in a manner that is in compliance with the appropriate governmental agency regulations.

Xenon Xe 133 adheres to some plastics and rubber and should not be allowed to stand in tubing or respirator containers. Such unrecognized loss of radioactivity from the dose for administration may render the study nondiagnostic. Xenon Xe 133 gas delivery systems, i.e. respirators or spirometers, and associated tubing assemblies must be leakproof to avoid loss of radioactivity into the laboratory environs not specifically protected by exhaust systems.

**ADVERSE REACTIONS:** To date, no adverse reactions based on the use of xenon Xe 133 gas have been reported.

**DOSEAGE AND ADMINISTRATION:** Xenon Xe 133 gas is administered by inhalation from closed respirator systems or spirometers. The suggested activity range employed for inhalation by the average adult patient (70kg) is:

- Pulmonary function including imaging: 2.30 Mci in 3 liters of air.
- Cerebral blood flow: 10.30 Mci in 3 liters of air.

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

**HOW SUPPLIED:** The xenon Xe 133 gas is supplied as part of the Calidose® system, consisting of 2 ml unit dose vials and the Calidose dispenser® for shielded dispensing.

Normally vials containing either 10 or 20 Mci/vial, packed up to 5 vials per shield tube, are supplied. Vial sets containing up to 100 Mci/vial are available.

Catalog Number NRP-127  *Patent Pending  *JO 127 July 1975, Rev 1

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### PULMOLITE™

**Technetium Tc 99m Aggregated Albumin Kit**

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

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

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

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

Theoretically, the intravenous administration of particulate material such as aggregated albumin may be a source of emboli that may reduce blood flow. While this effect is probably physiologically insignificant in most patients the administration of aggregated albumin is possibly hazardous in acute cor pulmonale and other states of severely impaired pulmonary blood flow. This radiopharmaceutical preparation should not be administered to children or to pregnant or lactating women unless the expected benefits to be gained outweigh the potential risks.

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

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

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

The contents of the vial are sterile and non-pyrogenic. It is essential that the user follows the directions carefully and adhere to strict aseptic procedures during preparation of the radiodiagnostic Technetium Tc 99m aggregated albumin is physically unstable and as such the particles will settle with time. Failure to mix the vial contents adequately before use may result in non-uniform distribution of radioactivity.

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

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

 Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m aggregated albumin should be used in pregnant women only when clearly needed. It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken while a patient is on a drug since many drugs are excreted in human milk.

Safety and effectiveness in children have not been established.

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

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

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

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

**DOSEAGE AND ADMINISTRATION:** The recommended intravenous dose range for the average adult patient (70kg) is 1 to 4 millicuries. The volume of the dose may vary from 0.2 to 1.3 ml.

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

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

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

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

Each vial contains 3.6-6.5 x 10⁴ aggregated albumin particles.

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

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

This reagent kit is approved for use by persons licensed by the U.S. Nuclear Regulatory Commission pursuant to Section 35.14 and 35.100 Group III of 10 CFR 35 or under licenses of Agreement States.

Catalog Number NRP-415  August 1976

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**NEN New England Nuclear**

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50A THE JOURNAL OF NUCLEAR MEDICINE
Bone

Diagnosis: hypertrophic pulmonary osteoarthritis

Imaging information:
- Instrument: GE MaxiCamera™ 535
- Scan time: 2.5-3.0 hours postinjection
- Acquisition time: 6 minutes/view

OSTEOLITE™
Technetium Tc 99m Medronate Sodium Kit (MDP)

New England Nuclear®

Please see following page for brief prescribing information.

SEE US AT THE SNM SHOW IN LAS VEGAS AT ISLAND "K"
OSTEOLITE
Technetium Tc 99m Medronate Sodium Kit (MDP)

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

CONTRAINDICATIONS: None known.

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

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

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

Technetium Tc 99m medronate sodium, as well as any radioactive agent, must be handled with care. Once sodium pertechnetate Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to the patient.

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

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

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m medronate sodium should be used in pregnant women only when clearly needed. It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: None reported.

DOSE AND ADMINISTRATION: The recommended dose for the average 70kg adult patient is 15mCi with a range of 10-20mCi. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

Optimal imaging results are obtained within one to four hours after administration.

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

The vial contains no bacteriostat.

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

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

Medronate Disodium — 10mg

Statistical Chloride Dihydrate — 0.85mg

The pH is adjusted to between 7.0-7.5 with hydrochloric acid and/or sodium hydroxide solution. The contents of the vial were lyophilized under nitrogen.

Storage at room temperature (15-30°C). Included in each five (5) vial kit is one (1) package insert and six (6) radiation labels. Included in each thirty (30) vial kit is one (1) package insert and thirty-six (36) radiation labels.

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

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

Catalog Number NRP-420 (5 vial kit)

Catalog Number NRP-420C (30 vial kit)

April 1978

GLUCOSCAN
Technetium Tc 99m Glucoplate Sodium Kit

APPLICATIONS AND USAGE: Technetium Tc 99m Glucoplate Sodium is used for brain imaging.

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

CONTRAINDICATIONS: None known.

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

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

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

PRECAUTIONS: Technetium Tc 99m Glucoplate Sodium, as well as any radioactive agent, must be handled with care. Once sodium pertechnetate Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to the clinical personnel.

Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

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

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

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

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m Glucoplate Sodium should be used in pregnant women only when clearly needed. It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

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

DOSE AND ADMINISTRATION: The recommended dose for the average (70kg) adult patient is 10-20 millicuries for both renal and brain imaging.

Technetium Tc 99m Glucoplate Sodium is intended for intravenous administration only.

Technetium Tc 99m Glucoplate Sodium should be used within six hours after aseptic reconstitution with sodium pertechnetate Tc 99m. For optimal results, this time should be minimized. The reaction vial contains no bacteriostat.

Optimal results for both renal and brain imaging are obtained one hour after administration.

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

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

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

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

Glucoplate Sodium — 200mg

Maximum Tn — 0.07mg

Stannous Chloride (min.) — 0.06mg

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

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

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

Catalog Number NRP-180 (5 vial kit)

Catalog Number NRP-180C (30 vial kit)

August 1978

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THE JOURNAL OF NUCLEAR MEDICINE
Kidney

Diagnosis: pyelonephritis of right upper pole

Imaging information: Instrument: Ohio Nuclear Sigma 410 Gamma Camera
Counts/image: 800 K for first postflow images, then same time for succeeding images

Dose: 15 mCi GLUCOSCAN

GLUCOSCAN™
Technetium Tc 99m Gluceptate Sodium Kit

Please see preceding page for brief prescribing information.
SEE US AT THE SNM SHOW IN LAS VEGAS AT ISLAND "K"
INDICATIONS AND USAGE: Technetium Tc 99m Gluceptate Sodium is used for brain imaging.

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

CONTRAINdications: None known.

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

Ideally, examinations should be performed with techni-pharmaceuticals — especially those elective in nature — of a woman of childbearing capability should be performed during the first ten days following the onset of the menses.

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

PRECAUTIONS: Technetium Tc 99m Gluceptate Sodium, as well as any radiopharmaceutical, must be handled with care. Once sodium pertechnetate Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to clinical personnel.

Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

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

The use of bacteriostatic sodium chloride as a diluent for sodium pertechnetate Tc 99m may adversely affect the biologic distribution of the prepared agent and thus should be avoided.

No long term animal studies have been performed to evaluate carcinogenic potential. Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m Gluceptate Sodium should be used in pregnant women only when clearly needed. It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

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

DOSEAGE AND ADMINISTRATION: The recommended dose for the average (76kg) adult patient is 10-20 millicuries for both renal and brain imaging.

Technetium Tc 99m Gluceptate Sodium is intended for intravenous administration only.

Technetium Tc 99m Gluceptate Sodium should be used within six hours after aseptic reconstitution with sodium pertechnetate Tc 99m. For optimal results, this time should be minimized. The reaction vial contains no bacteriostatic agent.

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

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

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

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

- Gluceptate Sodium — 200mg
- Stannous Chloride — 0.07mg
- Sodium Chloride — 0.06mg

To adjust pH to 6.0, mix the contents of the vial with 2.5ml of sterile water for injection, USP. This results in a concentration of 100mg/ml of sodium pertechnetate Tc 99m.

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

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

Catalog Number NRP-180 ($2.50 5 vial kit)
Catalog Number NRP-180C ($30.00 30 vial kit)

August 1978
**Brain**

Diagnosis: arteriovenous malformation

Imaging information: **Instrument:** Ohio Nuclear Series 100 Gamma Camera  
**Scan time:** 90 minutes post-injection  
**Counts:** 400 K

**GLUCOSCAN**  
Technetium Tc 99m Glucopectate Sodium Kit

Dose: 15 mCi GLUCOSCAN

Please see preceding page for brief prescribing information.

SEE US AT THE SNM SHOW IN LAS VEGAS AT ISLAND "K"
Thallium imaging in acute myocardial infarction

Lewis C. Becker, MD
Associate Professor of Medicine
Director, Nuclear Cardiology
The Johns Hopkins Medical Institutions
Baltimore, Maryland

One of the most significant findings to come from our clinical research over the past several years has been the observation that thallium-201 imaging, performed early after onset of symptoms, can reliably distinguish high-risk and low-risk groups of hemodynamically stable patients with acute myocardial infarction. The value of such a prognostic indicator in the management of acute MI is evident. Patients determined to be at low risk could be ambulated earlier and perhaps discharged sooner than in current practice; in the future, such patients might be placed early in a progressive-care-type unit rather than be maintained in the more expensive coronary care unit.

Patients at higher risk might be found to require more intensive monitoring for even longer periods than today. And following discharge, these patients could justifiably be subjected to much closer and long-lasting followup. Most important, reliable identification of patients at high risk would permit earlier initiation of aggressive treatment directed at limiting the extent of infarction.

Predicting mortality

Our recently reported study1 covered 42 consecutive patients determined by conventional means (history, ECG, serum creatine kinase) to have suffered an acute MI. These were Killip class I or II patients—the largest group of MI patients, and those normally considered to be at relatively low risk. All 42 patients were admitted within 12 hours of onset of chest pain, and underwent thallium imaging within 15 hours of onset.

The thallium images—in the anterior, 40° LAO, and 60° LAO views—were interpreted both subjectively and by a computer-assisted quantitative technique.2 For each interpretive approach, scores for all views were summed to give a total "defect score"—the lower the score, the smaller the area of thallium defect, with a total defect score of 7 corresponding to reduction in thallium uptake involving approximately 40% of the left ventricle in at least two views. The total defect scores were then correlated with the patients' subsequent clinical course and with other clinical indices believed to have prognostic value—previous history of MI, anterior location of MI, alveolar infiltrates on admission, peak CK greater than 1,000 IU/liter, age, and sex.

Of the 42 patients, 35 survived the initial hospitalization. These survivors were followed for 6 to 20 months after discharge.

What were our results? Nonsurvivors had significantly larger thallium defects than survivors. The mean score for nonsurvivors was 14.3 vs 2.3 for survivors. In the 13 patients with a score greater than 7—ie, 40% or more involvement—the inhos- pital mortality was 46%; at 6 months it was 62%; and at last followup (mean 9 months) it was 92%. In the group of patients with a total defect score less than 7, the inhospital mortality was 3%; at 6 months and at last followup, it was, respectively, 7% and 7%.

These data conclusively showed that the thallium study performed within hours of admission could identify apparently stable MI patients at high-risk for mortality. In addition, when we compared the predictiveness of the thallium score with the other clinical indices—history, MI location, enzymes, etc—singly and in combination, the thallium study was significantly better.

We were, of course, very excited by our results. But, because this was a retrospective study, we felt it important to validate the findings prospectively. Over a 6-month period, we studied more than 90 consecutive patients admitted to the CCU with documented or strongly suspected MI. We applied the same scoring system and same dividing line (score 7)—and confirmed our ability to use thallium imaging to distinguish between high-risk and low-risk groups. The mortality rates of the two groups were almost identical to those established in the earlier retrospective study.
**Irreversible damage and reversible ischemia**

We believe the thallium study accurately predicts prognosis in MI patients because the size of the defect reflects the total hypoperfused mass of the left ventricular myocardium—both infarcted and ischemic areas. We know from observations of other investigators that the thallium defect tends to diminish with time after an acute MI. Thus the image recorded immediately after admission will show a larger defect than those recorded on serial followup over subsequent days. Our own pathologic studies have demonstrated that large thallium defects seen on post-MI images may be associated with small areas of infarction on postmortem examination.

Together, these findings strongly support the concept that areas of reduced or absent thallium on the initial post-MI images represent both ischemia and infarction, and that the "filling-in" seen on followup imaging represents resolution of ischemia due to resolution of coronary artery spasm or enlargement of coronary collaterals. Thus, the post-MI study identifies myocardium irreversibly damaged by the acute event, myocardium damaged by previous infarction, and surrounding areas of severe ischemia that are at risk for necrosis either immediately or at some future time.

**Clinical implications**

In our patients, the highest percentage of in-hospital deaths was due to sudden pump failure—possibly due to the large total volume of compromised myocardium. Post discharge deaths were generally related to a new ischemic event. In both of these high-risk groups, the thallium study might have helped in patient management decisions. For those patients who died while in the hospital, more aggressive support might have been indicated; those whose deaths occurred posthospitalization might have been identified as candidates for coronary artery bypass.

**References**


Please see following page for brief summary of prescribing information.
Thallous Chloride TI 201

INDICATIONS AND USAGE: Thallous Chloride TI 201 may be useful in myocardial perfusion imaging for the diagnosis and localization of myocardial infarction. It may also be useful in conjunction with exercise stress testing as an adjunct in the diagnosis of ischemic heart disease (atherosclerotic coronary artery disease).

CONTRAINDICATIONS: None known.

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

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

Thallous Chloride TI 201, as all radioactive materials, must be handled with care and used with appropriate safety measures to minimize external radiation exposure to clinical personnel. Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

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

DOSE AND ADMINISTRATION: The recommended adult (70kg) dose of Thallous Chloride TI 201 is 1-1.5mCi. Thallous Chloride TI 201 is intended for intravenous administration only.

For patients undergoing resting thallium studies, imaging is optimally begun within 10-20 minutes after injection. Several investigators have reported improved myocardial-to-background ratios when patients are injected in the fasting state, an upright posture, or after briefly ambulating.

Results with thallium imaging performed in conjunction with exercise stress testing appear to be obtained if the thallium is administered when the patient reaches maximum stress and when the stress is continued for 30 seconds to one minute after injection. Imaging should begin within ten minutes post-injection since target-to-background ratio is optimum by that time. Several investigators have reported significant decreases in the target-to-background ratios of lesions attributable to transient ischemia by two hours after the completion of stress testing.

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

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

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

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electrical pharmacology
Following intravenous administration, the pertechnetate ion distributes in the body similarly to the iodide ion, but it is not readily trapped in the thyroid gland. Sodium Pertechnetate Tc 99m tends to accumulate in intracellular lesions, with exclusion from the neovascularity or an altered blood-brain barrier. It also concentrates in the thyroid gland, stomach and choroid plexus.
After intravascular administration, it remains in the circulatory system for sufficient time to permit blood pool, organ perfusion, and major vessel studies. It gradually equilibrates with the extracellular space. A fraction is promptly excreted via the kidneys.

indications and usage
Sodium Pertechnetate Tc 99m is used in patients as an agent for: brain imaging including cerebral radionuclide angiography; thyroid imaging; salivary gland imaging; placenta localization; and blood pool imaging including radionuclide angiography.
Sodium Pertechnetate Tc 99m is used in children as a drug for imaging including cerebral radionuclide angiography; thyroid imaging; and blood pool imaging including radionuclide angiography.

contraindications
None known.

warnings
Radiation risks associated with the use of Sodium Pertechnetate Tc 99m are greater in infants than in adults and, 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 into account in all benefit-risk assessments involving children.
This radiopharmaceutical preparation should not be administered to patients who are pregnant or to nursing mothers unless the expected benefits to be gained outweigh the potential hazards.

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

precautions
Sodium Pertechnetate Tc 99m, as well as other radiopharmaceuticals, must be handled with care and appropriate safety measures should be used to minimize external radiation exposure to both personnel and persons in the vicinity. Also, care should be taken to minimize radiation exposure to patients consistent with proper patient management.

Pregnancy Category C: animal reproductive studies have not been conducted with Sodium Pertechnetate Tc 99m. It is also not known whether Sodium Pertechnetate Tc 99m can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. Sodium Pertechnetate Tc 99m should be given to a pregnant woman only if clearly needed. It is not known whether this drug is excreted in human milk. As a general rule, nursing mothers should not be undertaken while a patient is on a drug since many drugs are excreted in human milk.
The generator should not be used after 16 days from the date and time of calibration. At time of administration, the solution should be clear crystal.

adverse reactions
No adverse reactions have been reported with the use of this radiopharmaceutical.
dosage and administration
Sodium Pertechnetate Tc 99m is usually administered by intravenous injection, but may be given orally. The dosage employed varies with each diagnostic procedure.
The suggested intravenous dose range employed for various diagnostic indications are as follows:

IN AVERAGE ADULT (70kg) PATIENTS:

Brain imaging 10 to 20 millicuries
Thyroid gland imaging 1 to 10 millicuries
Salivary gland imaging 1 to 5 millicuries
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Blood Pool Imaging 10 to 30 millicuries

IN PEDIATRIC PATIENTS:

Brain imaging: 140-280 microcuries/kg body weight. A minimum dose of 3-5 millicuries should be employed if cerebral radionuclide angiography is performed as part of the brain imaging procedure.

A minimum dose of 3-5 millicuries should be employed if radionuclide angiography is performed as part of the blood pool imaging procedure.

NOTE: Up to 1 gram of pharmaceutical grade potassium perchlorate in a suitable buffer can be given orally prior to administration of Sodium Pertechnetate Tc 99m for bone imaging. When Sodium Pertechnetate Tc 99m is given orally, the administration of potassium perchlorate is especially important for minimizing the absorbed radiation dose to the thyroid gland.

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

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.

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

NUCLEAR MEDICINE TECHNOLOGIST. Boston, MA. Full-time position for registered technologist, 1-3 yrs experience preferred. St. Elizabeth’s is a major teaching hospital affiliated with Tufts School of Medicine and offers excellent benefits and competitive starting salary. Our modern facility has 3 gamma cameras, portable LEM, LFOV and Standard FOV, a PHO/CON for emission tomography, 2 ADAC Computers, and a digital x-ray system. For additional information write: Supervisor of Nuclear Medicine, St. Elizabeth’s Hospital, Brighton, MA 02135; or call (617)787-2000, ext. 2080 or 2282.

REGISTERED NUCLEAR MEDICINE Technologist. Full-time opening for registered nuclear medicine technologist in expanding 167-bed hospital. Salary commensurate with experience. Excellent fringe benefits package. Submit resume to: Personnel Director, Box 340, Cookeville, TN 38501; or call Allison (collect) (615)528-2541, ext. 140. An Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST for new, 600-bed, university hospital providing excellent facilities and opportunities for continued learning. Registered in nuclear medicine or graduate AMA approved nuclear medicine program. Equal opportunity employer. Excellent fringe benefits. Contact Mr. J. Wader, University of Illinois Hospital, 1740 W. Taylor St., Chicago, IL 60612. Tel: (312)399-6231.

NUCLEAR MEDICINE TECHNOLOGIST. Immediate opening, full-time position available for a registered or registry eligible nuclear medicine technologist. 286-bed, acute-care facility located in the Valley of the Sun—Phoenix area—Arizona. Full range of in vivo procedures, 2 gamma cameras with computer, good salary, and employee benefits. Apply to Personnel Department, Methodist Hospitals of Phoenix, W. Brown Rd., Mesa, AZ 85201; or call (602)834-1211, ext. 2834.

NUCLEAR MEDICINE TECHNOLOGISTS, Ft. Lauderdale, Florida. Nuclear Medicine Pharmacy Department, VA Medical Center. A 400-bed, acute-care facility has positions available for registered or registry eligible technologists in its expanding nuclear medicine program. Equal opportunity, affirmative action, Title IX, Section 504, VA Employer. For information write: Personnel Administration, Nuclear Medicine Department. The department contains six scintillation cameras, a MDS computer, RIA department, and radiopharmaceuticals. Excellent starting salary and benefits. Inquire to Chief Technologist, Department of Nuclear Medicine, VA Medical Center, 4000 SW 7th Ave., Ft. Lauderdale, FL 33313; (305)735-6000.

NUCLEAR MEDICINE TECHNOLOGIST. Full-time position available for nuclear medicine technologist in a 365-bed, acute-care hospital. We have a modern, well-equipped lab, including two cameras and a computer. This individual should be trained in all imaging and quality control procedures, must be able to calibrate and operate two hardened routine radiopharmaceuticals, must be a graduate of an approved training program in Nuclear Medicine Technology and registered or eligible for registry. A background in ultrasound and nuclear cardiology is a plus. We offer an excellent salary and an attractive fringe-benefit package. Interested candidates should contact Sandra Eliot, Personnel Director, St. Joseph Community Hos- pital, 3100 E. Fletcher Ave., Tampa, FL 33612. Or call (813)971-6000.

NUCLEAR MEDICINE TECHNOLOGISTS. University Hospital, a 700-bed, general/ acute-care facility has positions available for certified technologists with at least one year’s experience in nuclear organ imaging and related procedures. Located midway between the mountains and the beaches, University Hospital offers an excellent salary and fringe-benefit package, including 22 days per year of paid time off, health and life insurance, and 100% tuition reimbursement. Write or call: Employment Office, University Hospital, 1350 Walton Way, Augusta, GA 30910. (404)724-5436. An Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST. 400-bed, acute-care facility on Florida’s gulf coast seeks registered or registry eligible nuclear medicine technologist for our expanding Nuclear Medicine Department. Full range of imaging and radioimmunoassay procedures performed; equipment includes Raybeen LFOV and Technicare (Ohio) portable cameras. MDS computer system, and fully automated RIA, Contact: Personnel Dept., Fort Myers Community Hospital, P.O. Box 7146, Fort Myers, FL 33901; (813)939-8551.

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NUCLEAR MEDICINE TECHNOLOGIST.

Full-time position available for registered technologist in nuclear medicine. Expanding facility with exceptional growth potential for the right person. Good salary range and employee benefits. Call Rick Stewart, Greater Bakersfield Memorial Hospital, Bakersfield, CA. Area code (805)327-1922 ext. 248 E.O.E.

NUCLEAR MEDICINE TECHNOLOGIST.

An expanding, 454-bed hospital needs a nuclear medicine technologist (ARRT, ASCP, or CNMT). The department is equipped with a Siemens LEOV, Whole Body Imager, and O/N Mobile Camera with computer. The stationary cameras are connected to an MDS computer. The department is staffed with four technical and four nontechnical personnel. Excellent salary, working conditions, and fringe-benefit program. Send resume or call Human Resource Department, Baptist Medical Center, P.O. Box 10100, Montgomery, AL 36198; (205)288-2100, Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST.

Full-time position available in a 150-bed, fully accredited hospital. Board certified or board eligible in Nuclear Medicine. Position requires proficiency in both imaging and RIA. Board certified or board eligible in Medical Technology also preferred. The Tennessee Valley is famed for its climate. Gatlinburg, TN, is a beautiful community situated within minutes of Old Hickory Lake. Many colleges and universities are located in this area. Resumes from all qualified candidates are welcomed and should be sent to Summer Memorial Hospital, P.O. Box 829, Gallatin, TN or call John Craig, Chief of Nuclear Medicine at (615)452-4210, ext. 579. An Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST.

Registered or eligible registered St. Anthony Hospital, 301 W. Homer Street, Michigan City, IN 46360. Phone (219)870-6581, Ext. 264. 8 A.M. to 4:30 P.M. Equal Opportunity Employer.

NUCLEAR MEDICINE/ULTRASOUND Technologist, Miami, Florida. Excellent opportunity for a registered, nuclear medicine technologist with some ultrasound experience. Imaging and procedures only. Full-time position. Facilities include Raytheon Step I & II System, Searle PH-EGamma IV, MDS A+ Computer, and Picker Digital Ultrasound Scanners. We are a 300-bed hospital with a rapidly growing department. Outstanding benefits. Salary negotiable. Please send résumé to Charlotte Lovett, Chief Nuclear Medicine Technologist or Personnel Office, Virginia Hospita, 955 NW 3rd St., Miami, FL 33129. Phone: (305)345-8000, ext. 3121.

REGISTERED NUCLEAR MEDICINE Technologist. Challenging position for registered technologist in a progressive department of a 560-bed, acute-care, general, teaching hospital. Full range of imaging and nuclear cardiology procedures performed. Equipment includes two Siemens and one G.E. Data Camera and Informatek Computer system. Excellent working hours and location. Spartanburg General Hospital is located in the rolling Piedmont section of SC among the foothills of the Blue Ridge Mountains, approximately 3 hours from Atlanta, and 4 hours from Myrtle and Charleston beaches. Send resumes to: Linda Wilson, Spartanburg General Hospital, 101 East Wood St., Spartanburg, SC 29303. EOE.

NUCLEAR CARDIOLOGY TECHNOLOGIST.

We have a unique opportunity for a registered nuclear medicine technologist with extensive nuclear cardiology experience, including stress, stress gated and gated studies. Responsibilities include research and clinical work. Cedars-Sinai is the West's largest not-for-profit medical center, located adjacent to Beverly Hills. We provide an excellent salary and benefit package in addition to the opportunity to work in a stimulating state-of-the-art environment. Please submit resume or call 213/855-5521 for more information. Cedars-Sinai Medical Center, 8723 Alden Drive, Los Angeles, CA 90048.

NUCLEAR MEDICINE TECHNOLOGIST.

Position available for an ARRT or CNMT registered/registry eligible technologist to work in the world's largest private hospital. Practicing your specialty in our modern, fully equipped lab is a true adventure. Over 3500 procedures monthly with duties to include routine imaging and/or cardiac procedures. Competitive salary and excellent benefits offered. For further information call or write Nell Tracy, Professional Recruiter, Baptist Memorial Hospital, 899 Madison Ave, Memphis, TN 38146, (901)322-5090 (collect) Equal Opportunity Employer M/F/H.

NUCLEAR MEDICINE TECHNOLOGIST.


NUCLEAR MEDICINE TECHNOLOGIST.

Registered or registry eligible nuclear medicine technologist for full-time position in a 314-bed hospital in southeast Oklahoma. Experience in nuclear cardiology procedures desirable. This progressive and dynamic department offers ultrasound, CT, as well as Nuclear Medicine services, 2 Gamma Cameras, dual-probe scanner, and clinical computer, etc. We offer an excellent benefit package and competitive salaries. Equal Opportunity Employer. Contact: Personnel Department, Jane Phillips, Episcopal Memorial Medical Center, Bartlesville, OK 74003; (918)333-7200, ext. 261.

NUCLEAR MEDICINE TECHNOLOGIST.

We are seeking staff technologists for our 500-bed Medical Center in Central Illinois. Proficiency required in imaging instrumentation procedures and radiopharmaceutical preparation. No in vitro experience required. The Department of Nuclear Medicine is equipped with the latest in stationary and mobile camera systems and computer capabilities. We offer excellent benefits and salary ($17,495-$20,606) with additional compensation for hours and emergency call coverage. Send resume in confidence to: Employment Manager, Methodist Medical Center, 300 W. E. Glen Oak Ave., Peoria, IL 61636. (309)672-5554. Equal Opportunity Employer.

POSITIONS WANTED

NUCLEAR MEDICINE SPECIALIST. Ph.D.; M.D.: Board certified; considerable administrative experience; strong Hematology background; desires academic or clinical position with research and teaching. Reply Box 500, Society of Nuclear Medicine, 475 Park Ave., New York, NY 10016.

NUCLEAR PHYSICIAN WITH OWN equipment and lab wants to relocate. Unusual opportunity for enterprising hospital. East or west coast preferred. Reply Box 501, Society of Nuclear Medicine, 475 Park Ave., New York, NY 10016.


NUCLEAR MEDICINE PHYSICIAN completing two-year residency in June 1981 seeks hospital or private group practice. Board eligible in general internist. Extensive training in nuclear cardiology, computer techniques, thyroid imaging and treatment, as well as the usual diagnostic imaging. Reply Box 503, Society of Nuclear Medicine, 475 Park Ave., New York, NY 10016.

CHIEF TECHNOLOGIST-CNMT, B.S., ARRT(RT). Eleven years experience supervising in all phases of imaging in vitro technology. Planning and organizing an established NM dept. Seeks position in Chicago metropolitan or suburbs. Reply Box 504, Society of Nuclear Medicine, 475 Park Ave., New York, NY 10016.

NUCLEAR MEDICINE PHYSICIAN. Board certified, presently hospital department head, over 60 publications, strong hematology background, desires position combining clinical, teaching, and research activities. Reply Box 505, Society of Nuclear Medicine, 475 Park Ave., New York, NY 10016.

FOR SALE

RAYTHEON DUAL DETECTOR SCANNER. Model NO. 625C, Serial NO. S107. For inforrnation, call (516)255-2527 or write Department of Radiology, Mercy Hospital, Rockville Centre, New York 11570.

SNM ANNUAL MEETING Placement Service

The Society of Nuclear Medicine Annual Meeting Placement Service is accepting applications from employers and job seekers. The Service is open to SNM members for $5.00, non-members for $15.00 and to employers for $25.00. "Job Applicant" and "Position Description" applications will be accepted for the following positions: Nuclear Medicine Physician, Technologist, Scientist and Corporational. The Placement Service is designed to bring prospective employers and employers together through personal interviews. It presents a unique opportunity for registrants to look through a collection of applications, meet on a one-to-one basis and develop important career contacts for present and future use.

Applications may be obtained at the Placement Service Office which will be located in the Las Vegas Convention Center, Room K-1, Las Vegas, Nevada, June 16-19, 1981.

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JUNIOR FACULTY OPENING

The Department of Radiological Sciences at the University of California, Irvine, College of Medicine announces a junior faculty opening in the Division of Nuclear Medicine (Philip Braunstein, M.D., Director of Nuclear Medicine).

Applicants should be ABNM certified or eligible and a radiology background is preferred. Position primarily involves clinical and teaching responsibilities in an expanding department with two computers, performing full range of in vivo procedures, including nuclear cardiology. Research encouraged.

Applications from all qualified candidates are welcome. UCI is an equal opportunity employer. Applications, including a curriculum vitae and copies of any publications, should be sent to:

Richard M. Friedenberg, M.D., Professor and Chairman, Dept. of Radiological Sciences, Univ. of California, Irvine, College of Medicine, 101 City Dr. South, Orange, California 92668.

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NUCLEAR PHARMACY SERVICES

NUCLEAR PHARMACISTS

We are one of the leaders in this exciting field and now have positions available nationwide for managers and staff nuclear pharmacists. We are especially interested in R.Ph.’s for the northeast & midwest area.

We offer the best incentive programs for managers, excellent fringe benefits and salaries commensurate with experience.

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25721 Coolidge
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OR CALL 313-543-8400 EOE

NUCLEAR MEDICINE TECHNOLOGIST

Interesting and challenging positions are available in one of the most advanced scanning departments in the Southeast. Openings involve both general diagnostic and cardiovascular nuclear medicine. Salaries and benefits package commensurate with high standards of Miami Heart Institute.

Call COLLECT or WRITE:
Personnel Department
MIAMI HEART INSTITUTE
4701 N. Meridian Avenue
Miami Beach, Florida 33140
(305) 674-3100
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NUCLEAR MEDICINE TECHNOLOGIST

Come to Connecticut and YALE-NEW HAVEN HOSPITAL for an exceptional and challenging full time staff position in our Nuclear Medicine Dept.

If you are registered or registry-eligible and have broad experience and training in all phases of nuclear medicine procedures, then this may be the opportunity you’ve been looking for.

We offer an excellent, stimulating, and diversified work environment as well as an outstanding compensation package, which includes a competitive starting salary, paid medical insurance coverage, an innovative and flexible paid time-off program, extended sick benefits plan (short-term disability), long-term disability, pension plan, tax shelter annuity program, employee educational assistance program and many other benefits.

If you are interested in becoming a member of the Nuclear Medicine staff or our progressive, acute care medical center hospital, then please respond in confidence to Mrs. Zannette Moore, Personnel Administration-J2.

YALE-NEW HAVEN HOSPITAL
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THE JOURNAL OF NUCLEAR MEDICINE
NUCLEAR MEDICINE TECHNOLOGIST
Immediate full-time position available for a Registered or Certified Nuclear Medicine Technologist in a modern 358-bed general acute-care hospital. Emphasis on Nuclear Imaging, Stress Thallium Myocardial Imaging and Graded Stress Cardiac Blood Pool Studies.
Equipment: Two 10" Ohio Nuclear Cameras, Ohio Nuclear LFOV and Rectilinear Scanner and Multi-terminal Ohio Nuclear 450 VIP Computer System.
Good salary and fringe benefits. Contact: Doug Cheatham, Wadley Hospital, 1000 Pine Street, Texarkana, TX 75501. (214) 794-7334.

1982 RESIDENCIES IN NUCLEAR MEDICINE

The Department of Radiology at Harvard Medical School invites applications to its two- and one-year residency programs in nuclear medicine and nuclear radiology for 1982.
Further requests should be directed to S. James Adelstein, M.D., Ph.D., Director, The Joint Program in Nuclear Medicine, Department of Radiology, Harvard Medical School, 25 Shattuck Street, Boston, MA 02115.
An Affirmative Action/Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST
We are currently seeking a full-time Registered or Registry-eligible Nuclear Medicine Technologist. Full range of in vivo procedures. We are a 304-bed acute care hospital with an active cardiovascular imaging section. Competitive salary and excellent benefits. Enjoy sunny southern California where beaches and mountains are within close driving distance.

Apply to:
MADELINE TAYLOR
EMPLOYMENT COORDINATOR
St. Jude Hospital and Rehabilitation Center
101 E. Valencia Mesa Drive
Fullerton, California 92634
or call (714)992-3924

NUCLEAR MEDICAL TECHNOLOGISTS
Don't Choose One... Choose Three.

Located on Florida’s Gold Coast, our three-hospital system is expanding its Nuclear Medicine Departments at all three facilities.
Day positions for registry or registry eligible technologists; experience in nuclear imaging and R.I.A. preferred. Nuclear cardiology experience a plus.
Excellent salary and benefits including new flexible personal leave program, 100% tuition reimbursement, etc. Send resume to:
District Personnel
NORTH BROWARD HOSPITAL DISTRICT
1625 Southeast Third Ave.
Ft. Lauderdale, FL 33316

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DIGITAL EQUIPMENT CORPORATION
has an immediate opening for a nuclear medicine technologist. Applicant must have some programming experience in Fortran, Basic or Macro-11, and some knowledge of operating systems (preferably RT-11). Candidate must be willing to travel. BA or BS degree required. Send resume to CAPS, c/o Digital Equipment Corporation, 27 Hudson Road, Sudbury, Massachusetts 01776.

NUCLEAR MEDICINE TECHNOLOGIST
Immediate opening in a community teaching hospital 18 miles west of Boston for a Registered or Registry Eligible Technologist. Full range of in vivo procedures, 3 gamma cameras and MDS computer system. Department active in cardiovascular imaging procedures. Imaging experience preferred.
Send resumes to Personnel Department, Framingham Union Hospital, 226 Union Avenue, Framingham, MA 01701.

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NUCLEAR MEDICINE TECHNOLOGIST

Ball Memorial Hospital, East Central Indiana's major referral center and progressive health care facility has an immediate opening for a Nuclear Medicine Technologist. Must be ARRT and/or NMTCB certified or eligible.

We are a 600-plus bed hospital offering an excellent cultural, educational and living environment, adjacent to Ball State University. Our new complete multi-million dollar expansion program includes new facilities for our Nuclear Medicine Department. Our equipment includes 3 cameras and a new MDS multi-terminal computer system.

Excellent salary and full program of benefits.

COME GROW WITH US! Please send resume to James Funk, Personnel Office or call to arrange a personal interview. (317) 747-3007.

BALL MEMORIAL HOSPITAL
2401 University Ave.
Muncie, IN 47303
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JNM CLASSIFIED PLACEMENT SERVICE SECTION

This section in the Journal of Nuclear Medicine contains "Positions Open," "Positions Wanted," "For Sale," and "Equipment Wanted" listings. Non-display "Positions Wanted" ads by members of the Society are billed at 70¢ per word for each insertion with no minimum rate. Non-display "Positions Wanted" ads by non-members and all non-display "Positions Open," "For Sale" and "Equipment Wanted" ads by members and nonmembers are charged at 90¢ per word. Display advertisements are accepted at $150 for ¼ page, $205 for ½ page, $325 for ¾ page, and $560 for a full page.

Closing date for each issue is the 1st of the month preceding publication. Agency commissions and cash discounts are allowed on display ads only. Box numbers are available for those who wish them.

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

Journal of Nuclear Medicine
475 Park Avenue South
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THE JOURNAL OF NUCLEAR MEDICINE
THE SMALL CAMERA WITH THE HIGH I.Q.

It's called the Intelligent Video-Imager, because it has digital selection and memory storage of brightness, contrast and exposure settings for up to four film types or video signals. And a microprocessor that controls raster line elimination, remote operation and the photometer system.

It's small in size but big on benefits. Like raster line elimination, which yields increased vertical information density and image dynamic range. Obsine light fall off correction, providing exceptionally uniform light transmission, is a special feature of an optical system specifically designed for video photography.

It can automatically self-diagnose, self-calibrate before every exposure, and record single frame images without freeze frame. A series of interlocks and operator feedback functions prevent common errors like leaving the dark slide in the cassette. Rugged enough for prolonged mobile use. You don't even have to warm it up.

Space limitations? The Intelligent Video-Imager can mount in a standard rack—it's just 10 1/2 " high x 16 1/2 ” wide x 22 ” deep. Available in 1, 4, 6, or 9 image formats, all with our new proprietary ultra-high-resolution, flat-faced monitor to insure excellent image quality.

Worldwide sales and service. For more information, call us at (201) 767-1750, or toll-free, (800) 526-0274, or write Matrix Instruments, 230 Pegasus Avenue, Northvale, New Jersey 07647. Telex: 135131
No knobs, no meters, no errors
The spartan panel above tells the second-best part of our story. If you want to photograph peak systole, press the SYSTOLE button. If, say, you want systole only at full expiration, press the EXPIRATION button as well. If only breathing is relevant, don't press the heart button.

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

Brattles lock onto patients — and stay locked on
It doesn't matter if the patient's heart rate and breathing depth change while he's under the collimator because we stay right with him. Brattles contain an ECG to track heart, a plethysmograph to track respiration, and a tiny computer to deduce systole and diastole times from the heart signal. And because it's all built in, your operator need not be a physiologist.

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

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

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

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

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