Nuclear Pacific introduces two new ways to see what you’re getting into.

Now, from the same company that developed the first syringe shield with total visibility, two safe, total visibility vial shields.

In addition to eliminating shielding leakage each unit provides:

- 360 degree visibility for fast, certain syringe filling.
- Assured safety from Nuclear Pacific’s own Hi-D®

**Specifications:**

<table>
<thead>
<tr>
<th>Isotope</th>
<th>Activity in Vial</th>
<th>Exposure of Surface of Vial Shield</th>
<th>Attenuation Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 mCi</td>
<td>116 mC</td>
<td>10 mV/HR</td>
<td>8.000</td>
</tr>
<tr>
<td>NRC (1) 430 mC</td>
<td>NCRP (2) 578 mC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67 Ga</td>
<td>0.98 mC</td>
<td>10 mV/HR</td>
<td>1.00</td>
</tr>
<tr>
<td>NRC (1) 35 mC</td>
<td>NCRP (2) 47 mC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>131 I</td>
<td>0.25 mC</td>
<td>10 mV/HR</td>
<td>0.50</td>
</tr>
<tr>
<td>NRC (1) 10 mC</td>
<td>NCRP (2) 12 mC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$225 ea., F.O.B. Seattle.

(1) NRC max permissible dose—hands—18.75 rems/quarter
(2) NCRP Report No. 39 Max permissible dose—hands—25 rems/quarter

Both above converted to 8 hours/day. 60 days per quarter.

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Name

Title

Institution/Department

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City State Zip

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Transverse-Section Brain Imager
...adds a third dimension to nuclear imaging.

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- Improved resolution and information density over conventional radionuclide imaging.

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* Trade mark 0825
The choice: The Raytheon XL-91

The 520-bed Abington Memorial Hospital in Abington, PA, outside Philadelphia, has added a new Raytheon XL-91 gamma camera to its new wing. And right from start-up the XL-91 has been producing images of superior resolution, with much greater patient accessibility and operator convenience than other equipment.

The reasons for the XL-91's success at Abington are clear. At 16½ inches the XL-91 provides the widest undistorted field of view of any gamma camera. The XL-91's exclusive Autocomp circuitry achieves ±2% uniformity and — with as many as four memories — permits users to calibrate to four different isotopes or collimators.

Patient comfort, operator convenience, superior high resolution images. No wonder Abington Memorial had the XL-91 working a full patient schedule just days after delivery. And outstanding customer acceptance of the XL-91—such as at Abington Memorial—is the reason Raytheon has had to expand its sales and service coverage greatly. From coast to coast, wherever you are, Raytheon is now near you.

If you'd like more information on the XL-91, write or phone Raytheon Company, Medical Electronics, 70 Ryan Street, Stamford, CT 06907. Telephone: 800-243-9058. We will put you in touch with your nearest Raytheon sales engineer.

The Raytheon XL-91...the 91-tube image maker.
The package is new. The quality is traditional.
It speaks plain English.
You don’t have to learn a computer language to operate the ADAC Clinical Data System. You do the whole thing in plain, uncomplicated English. It’s as easy as “hunt and peck” on a typewriter.

Even more important, ADAC delivers the highest resolution available today for quantitative organ function analysis. Our exclusive 512 x 512 display matrix and 64 shades of gray gives you images nearly identical to original analog scintiphotos.

And our exclusive software “refocus” capability increases the resolution of your scintillation camera by 30% or more to delineate hard-to-detect abnormalities.

The ADAC Clinical Data System provides every feature you’d expect in the finest diagnostic instrument of its kind. And at a surprisingly low cost.

An actual demonstration is the only way you can fully appreciate the clear superiority of the ADAC Clinical Data System for nuclear medicine.

To arrange for one at a convenient location near you, please write or phone collect.

Mallinckrodt research has now developed a formula that combines the quality features of our frozen TechnetScan MAA product with the convenience of lyophilization. Our goal was to match—as closely as possible—particle-size range and consistency specifications that had been established with the frozen process. In our search we were determined not to compromise current product performance or specifications of our frozen product for the sake of convenience.

The introduction of Mallinckrodt’s TechnetScan MAA—Lyophilized—represents the successful conclusion of our search for a specially designed freeze-dry process.

No need to freeze. Simply refrigerate for these same quality features.

Safety . . .
TechnetScan MAA is very well tolerated. Effective lung excretion half-life is approximately 3.8 hours—virtually complete biological excretion occurs in about 24 to 48 hours. Although the possibility exists, there is, to date, no evidence of antibody formation.

Increased Shelf Life . . .
The expiration date of each TechnetScan MAA lyophilized kit is now one year after date of manufacture. This extended shelf life permits the convenience of larger inventories plus the cost savings of buying in quantity.

Reliable Consistency . . .
Reconstitution does not affect either particle quality or size distribution. The particle size does not change after the addition of pertechnetate solution. There is no tendency for the particles to hydrate and increase in size after labeling. WE ENCOURAGE MICROSCOPIC EVALUATION AND COMPARISON!

Controlled Particle-Size Range . . .
Specifications require that not less than 90% of the particles be 10 to 90 microns in size, with not more than 10% below 10 microns, and none greater than 150 microns. Our investigations indicate that, typically, 90% of the TechnetScan MAA particles are in the 10-40 microns range. This controlled particle size range, plus the fact that there is no tendency to agglomerate, results in good images of lung perfusion.

High Tagging Efficiency . . .
The tagging efficiency experienced with the TechnetScan MAA kit is remarkably consistent, always at or near 100% conversion of pertechnetate to labeled MAA, with no loss of the label for up to 24 hours.

Easy Preparation . . .
Preparation of TechnetScan MAA Tc-99m is easy.
1. Allow five minutes to reach room temperature.
2. Add Tc-99m.
3. Agitate gently.
4. Wait fifteen minutes for high tagging efficiency.
That’s all!

Economy . . .
The TechnetScan MAA Kit doesn’t need expensive accessory equipment. Up to 15 adult patients can be scintigraphed from the preparation of a single vial of TechnetScan MAA. This helps reduce the procedure cost per patient.

For those who were acquainted with the frozen product, we give our assurance of continued satisfaction; for those who were unable to use frozen TechnetScan MAA because of storage considerations, we invite your evaluation of our lyophilized formula. For further information contact your Mallinckrodt representative.

Consult package insert for complete prescribing information, a summary of which follows the next page.
TechneScan® MAA KIT

AGGREGATED ALBUMIN (HUMAN) KIT (Lyophilized)
Catalog No. 093
Store at 2°C – 8°C
The ice is out at Mallinckrodt.

THE QUALITIES YOU LIKED IN OUR FROZEN PRODUCT ARE ALL HERE IN ITS LYPHILIZED SUCCESSOR.

**TechneScanMAA LYPHILIZED**

(AGGREGATED ALBUMIN (HUMAN))

Multi-Dose Kit for the Preparation of Technetated (Tc 99m) Aggregated Albumin (Human)

Diagnostic—For Intravenous Use

**DESCRIPTION**

The TechneScan MAA 10-milliliter vial contains a sterile, pyrogen-free, lyophilized mixture of 2.0 milligrams of aggregated albumin (Human), 120 micrograms of stannous chloride dihydrate, 80 milligrams of lactose, 24 milligrams of succinic acid and 1.4 milligrams of sodium acetate.

TechneScan MAA is prepared from albumin that was nonreactive when tested for hepatitis B antigen (HBsAg) by radioimmunoassay. Each vial contains approximately 8 ± 2 x 10^8 aggregated albumin particles. The particle size distribution of the aggregated albumin is such that no less than 90 percent are 10 to 90 microns in size. Typically, approximately 90 percent are within the 10 to 40 micron range. There are no aggregated albumin particles greater than 150 microns in size. Reconstitution of TechneScan MAA with sterile, non-pyrogenic sodium pertechnetate Tc 99m provides an aqueous suspension of technetium Tc 99m aggregated albumin, with a labeling efficiency of 90 percent or greater.

**INDICATIONS AND USAGE**

TechneScan MAA Tc 99m is indicated only for scintigraphic imaging of the lungs as an adjunct to other diagnostic procedures whenever information about pulmonary circulation is desired.

**CONTRAINDICATIONS**

TechneScan MAA Tc 99m should not be administered to patients with severe pulmonary hypertension.

The use of TechneScan MAA Tc 99m 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 of TechneScan MAA Tc 99m.

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

This radiopharmaceutical preparation should not be administered to persons under the age of 18, to pregnant women or to nursing mothers unless the expected benefits to be gained outweigh the potential risks.

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

**PRECAUTIONS**

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

The contents of the TechneScan MAA 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 TechneScan MAA Tc 99m depend upon maintaining tin in the reduced state. Any oxidants present in the sodium pertechnetate Tc 99m may thus adversely affect the quality of the preparation. Hence, sodium pertechnetate Tc 99m containing oxidizing agents is not suitable for preparation of TechneScan MAA Tc 99m.

The contents of the TechneScan MAA vial are sterile and pyrogen free. It is essential that the user follow the directions carefully and adhere to strict aseptic procedures during preparation of the radiopharmaceutical.

**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 patient (70 kg) is 1 to 4 millieuries. The volume of the dose may vary from 0.4 to 1.6 ml.

The recommended number of aggregated albumin particles to be administered per dose is 200,000-1,200,000 with the suggested number being approximately 600,000.

**HOW SUPPLIED**

Catalog Number 093 TechneScan MAA Kit (Lyophilized)

Kit Contains: 5—Aggregated Albumin (Human) Reaction Vials (1 ml each)—for the preparation of Technetated (Tc-99m) Aggregated Albumin (Human)

Reaction Vial Contains (in lyophilized form):

- 2.0 mg Aggregated Albumin (Human) (8 ± 2 x 10^8 particles)
- 120 μg Stannous Chloride Dihydrate
- 80 mg Lactose
- 24 mg Succinic Acid
- 1.4 mg Sodium Acetate
- Hydrochloric Acid or Sodium Hydroxide is added for pH adjustment.

Each vial contains 8 ± 2 x 10^8 aggregated albumin particles.

TechneScan MAA contains no preservatives; after reconstitution, the shielded vial should be stored at 2° to 8°C.

Included in each package is one (1) package insert, 5 radiation labels and 5 radioassay information string tags.
“Make the best available better!”

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

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

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

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

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Whatever size or shape your medical images may take, there's a Dunn 600 Series Video Display Camera to take the picture. We were the first to develop and refine the concept of multiple image hard copy on x-ray film. A bright idea we've since patented. And we're still the best. Because it takes a lot more than a multitude of format choices, push buttons, and flashing lights to make a Dunn Camera. It takes quality components like our high resolution, high linearity, custom modified Conrac video monitors. Exclusive features like our flash card data entry, remote camera operation, Spot Meter Exposure System, front panel Master Brightness Control, and control logic to prevent double exposures. Flexibility of design that lets you either shelf mount the camera or use it as a space-saving pedestal. Options like video inverters, and character generators you can hold in the palm of your hand. And optics like our very high quality Schneider lens with electronic shutter. But most of all, it takes years of experience, proven units in the field, and our people who manufacture, service and back up what we sell. That's what it takes to make a Dunn Camera. And nobody can take that away from us.
Bone Scanning Kit

Technetium Tc 99m Pyrophosphate Tin Kit

- Three (3) Hour Formulation Time
- Six (6) Month Shelf Life
- Six (6) Vials Per Kit
- Room Temperature Storage
- Freeze Dried
- Nitrogen Covered Inert Atmosphere

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(415) 837-1321 (Inside California)

General Radioisotope Products
San Ramon, California 94583
A subsidiary of Bio-Dynamics, Inc.
Indianapolis, Indiana 46250
Bone Scanning Kit

Technetium Tc 99m Pyrophosphate Tin Kit
For Diagnostic Use

Description
Each reaction vial contains 15.0 mg Sodium Pyrophosphate and 0.30 mg Stannous Chloride; the product does not contain a preservative. The pH of the product is adjusted with Sodium Hydroxide or Hydrochloric Acid prior to lyophilization. At the time of manufacture, the air in the vial is replaced with a Nitrogen Gas atmosphere. When sterile, Pyrogen-free Sodium Pertechnetate Tc 99m is added to the vial, a Technetium Tc 99m Pyrophosphate Tin Complex is formed. The precise structure of the Technetium Tc 99m Pyrophosphate Tin Complex is unknown at this time.

Administration is by intravenous injection for diagnostic use. The product as supplied is sterile and Pyrogen-free.

Technetium Tc 99m decays by isomeric transition with a physical half-life of 6.03 hours. The principal photon that is useful for detection and imaging studies is listed in Table I.

Table I. Principal Radiation Emission Data

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Mean % Disintegration</th>
<th>Mean Energy [keV]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma-2</td>
<td>87.9</td>
<td>140.5</td>
</tr>
</tbody>
</table>


External Radiation
The specific gamma ray constant for Tc 99m is 0.8 R/mC-hr at 1 cm. The first half value layer is 0.2 mm of Pb. To facilitate control of the radiation exposure from milliCurie amounts of this radionuclide, the use of a 2.7 mm thickness of Pb will attenuate the radiation emitted by a factor of 10,000.

Table II. Radiation Attenuation by Lead Shielding

<table>
<thead>
<tr>
<th>Shield Thickness [Pb] mm</th>
<th>Coefficient of Attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td>2.7</td>
<td>10</td>
</tr>
<tr>
<td>3.6</td>
<td>25</td>
</tr>
<tr>
<td>4.5</td>
<td>50</td>
</tr>
</tbody>
</table>

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

Table III. Physical Decay Chart: Tc 99m, half-life 6.03 hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Fraction Remaining</th>
<th>Hours</th>
<th>Fraction Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>0*</td>
<td>1.00</td>
<td>10</td>
<td>0.317</td>
</tr>
<tr>
<td>1</td>
<td>0.891</td>
<td>11</td>
<td>0.302</td>
</tr>
<tr>
<td>2</td>
<td>0.795</td>
<td>12</td>
<td>0.252</td>
</tr>
<tr>
<td>3</td>
<td>0.708</td>
<td>18</td>
<td>0.126</td>
</tr>
<tr>
<td>4</td>
<td>0.631</td>
<td>24</td>
<td>0.063</td>
</tr>
</tbody>
</table>

*Calibration Time

Clinical Pharmacology
Following intravenous administration of Technetium Tc 99m Pyrophosphate Tin solution, skeletal uptake occurs as a function of blood flow to bone and bone efficiency in extracting the complex. Bone mineral crystals are generally considered to be hydroxyapatite, and the complex appears to have an affinity for the hydroxyapatite crystals in bone.

Clearance of the radioactivity from the blood is quite rapid with skeletal uptake and urinary excretion being the principal mechanisms of clearance. At two hours following intravenous injection, approximately 95% of the injected dose is localized in bone, at four hours approximately 10% of the dose remains in the vascular system, decreasing to about 7% percent at 24 hours. The average urinary excretion was observed to be about 38% of the administrated dose after eight hours, increasing to an average of about 44 percent at 24 hours. A minimum amount of uptake has been observed in soft-tissue organs, most notably the kidneys.

Indications and Usage
Technetium Tc 99m Pyrophosphate Tin Complex may be used as a bone imaging agent to delineate areas of altered osteogenesis.

Contraindications
None known.

Warnings
Technetium Tc 99m Pyrophosphate Tin should not be administered to patients who are pregnant, or to nursing mothers unless the benefits of being gains outweigh the potential hazards. Ideally, examinations using radiopharmaceuticals, especially those electively in nature, of a woman of child-bearing capability should be performed during the first few (approximately 10 days following the onset of menses.

It is reported that false-positive or false-negative brain scans may result when brain scans using Sodium Pertechnetate Tc 99m are performed after a bone scan has been done using an agent containing Stannous ions, e.g., a Pyrophosphate bone agent. This is thought to be due to the interaction of Tc 99m with Stannous ions inside red blood cells. Therefore, in those cases where both brain and bone scans are indicated, the brain scan should be performed first, if feasible. Alternatively, another brain imaging agent, such as Tc 99m DTPA, may be employed.

The contents of the reaction vial are intended only for use in the preparation of Technetium Tc 99m Pyrophosphate Tin solution and are not to be directly administered to the patient. Any Sodium Pertechnetate Tc 99m solution which contains an oxidizing agent is not suitable for use with the Technetium Tc 99m Pyrophosphate Tin Kit.

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

Precautions
Technetium Tc 99m Pyrophosphate Tin solution, 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 must be taken to minimize radiation exposure to the patient consistent with proper patient management.

Both prior to and following administration of Technetium Tc 99m Pyrophosphate Tin solution, the patient should be encouraged to drink fluids and to void as often as possible thereafter to minimize radiation exposure to the bladder and background interference during imaging.

Technetium Tc 99m Pyrophosphate Tin solution must be used within 3 hours of reconstitution.

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 Pyrophosphate Tin should be used in pregnant women only when clearly needed.

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

Safety and effectiveness in children have not been established.

Adverse Reactions
No adverse reactions specifically attributable to the use of Technetium Tc 99m Pyrophosphate Tin have been reported.

Dosage and Administration
The suggested dose range for intravenous administration to be employed in the average patient (70 kg) is 1 to 15 milliCuries Technetium Tc 99m labeled Pyrophosphate Tin.

Technetium Tc 99m Pyrophosphate Tin solution is injected intravenously over a 10- to 20-second period. Imaging may be started at one hour after administration; however, for optimal results, bone imaging should be performed two to four hours following administration.

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

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

Technetium Tc 99m Pyrophosphate Tin is prepared by adding 1 ml of Sodium Pertechnetate Tc 99m solution to the vial and shaking gently. Shielding should be utilized when preparing the Tc 99m Pyrophosphate Tin.

Radiation Dosimetry
The effective half-life was assumed to equal the physical half-life for all calculated values. The estimated absorbed radiation doses to an average patient (70 kg) from an intravenous injection of a maximum dose of 15 milliCuries of Tc 99m Pyrophosphate Tin are shown in Table IV.

Table IV. Absorbed Radiation Dose

<table>
<thead>
<tr>
<th>Tissue</th>
<th>To 99m Pyrophosphate Tin [mCi/15 milliCurie]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skeleton</td>
<td>0.52</td>
</tr>
<tr>
<td>Bone Marrow</td>
<td>0.54</td>
</tr>
<tr>
<td>Kidneys</td>
<td>0.42</td>
</tr>
<tr>
<td>Liver</td>
<td>0.18</td>
</tr>
<tr>
<td>Total Body</td>
<td>0.14</td>
</tr>
<tr>
<td>Bladder</td>
<td>0.87</td>
</tr>
<tr>
<td>Testes</td>
<td>0.06</td>
</tr>
<tr>
<td>Ovaries</td>
<td>0.10</td>
</tr>
<tr>
<td>3 hour void</td>
<td></td>
</tr>
<tr>
<td>6 hour void</td>
<td></td>
</tr>
<tr>
<td>12 hour void</td>
<td></td>
</tr>
</tbody>
</table>

*At dose of highest uptake may be a factor of 10 higher.

If patient voids frequently after radiopharmaceuticals are administered, this dose will be reduced slightly.


How Supplied
A. 8 sterile immediate drug containers each containing: (Lyophilized).

- 15.0 mg Sodium Chloride
- 0.30 mg Stannous Chloride
- HCI or NaOH to adjust pH
- Nitrogen Gas

B. 6 radiotracey string labels for the immediate drug container.

C. 6 radioactivity labels for the lead shield.

D. 1 package insert.

E. 1 instruction card.

Storage
Store the Technetium Tc 99m Pyrophosphate Tin solution between 2° and 8°C. Use the radioactive complex within 3 hours after reconstitution.

Preparation
Do not use if there is a reason in the immediate drug container or if air is injected into the container when the dose is withdrawn. Formulate within 3 hours prior to clinical use.

1. Fix the string radioactivity label to the neck of the immediate drug container.

2. Add 0.5 ml of Stannous Chloride solution containing radioactive Sodium Pertechnetate Tc 99m and withdraw an equal volume of Nitrogen Gas. Do not allow air to enter the container. Do not use the Technetium Tc 99m solution if it contains foreign material.

3. Disperse and mix well by gently shaking the container in the shield for 30 seconds to one minute.

4. Measure and record the Tc 99m radioactivity and calibration data on the string radioactivity label and on the shield radioactivity label. Enter the time of expiration in the space provided and fix the label to the shield.

5. Maintain adequate shielding of the Technetium Tc 99m Pyrophosphate Tin at all times.

This reagent kit is approved by the California Department of Health for distribution to persons licensed pursuant to Sections 35.14 and 35.100, Group III of 10 CFR 35, or under equivalent licenses of Agreement States.
Radx has now programmed its new Meletron to read its own calibration factors. The Meletron programmable microprocessor allows you to check each of the Isotope Selector Keys for proper multiplication factors.

Radx employs direct mathematical manipulation for the various radionuclides (other dosecalibrators vary the resistance to alter the signal from the ionization chamber to the digital meter) and these factors can now be recalled from memory and displayed on the digital readout. Since each radionuclide has a finite and discrete mathematical factor, the ability to recall and display this factor (as triggered by the Isotope Selector Key) will remove any doubt concerning this aspect of dosecalibration.

Area radiation can also be monitored by the new Meletron. With the key out, “Background – Error” will flash when the radiation level exceeds approximately 2.0 mR/hr (with an unshielded unit).

Area monitoring is standard on Meletron; an extra cost option on other dosecalibrators.

Hard copy data of your radionuclide calibrations is another RADX first. The Melecord prints, time, date, volume, calibration, patient dose, radionuclide — plus it calculates and then prints the volume to administer. Easy compliance with NRC requirements is also assured by Melefile, the RADX record keeping system which provides data cards, tab cards and a compact file to keep them in.

Obsolescence is eliminated. The Meletron employs the latest in microprocessor technology. The highly reliable microprocessor is readily programmable to perform a wide variety of functions. Further program modifications may be added to your unit in the field, as they are developed.

For a permanent solution to your dosecalibration and record-keeping problems, call RADX — the innovators in nuclear medicine. RADX, P. O. Box 19164, Houston, Texas 77024, 713/468-9628.

Melétron & Melécord . . . your key to accurate dosecalibration and error-free records.
Dependable bone
Excellent in vitro stability
Greater than 98% labeling efficiency 8 hours after preparation. Osteoscan contains sodium ascorbate, an antioxidant that inhibits action of radiolysis by-products and oxidants capable of causing complex breakdown and resultant soft tissue visualization.

Compatible with all types of technetium
Delivers consistently high-quality scans, using either instant or generator technetium.

Plus these other Osteoscan benefits
- very low tin level to minimize potential for liver visualization and for interference with subsequent brain scans
- rapid blood clearance
- high target-to-nontarget ratio
- diphosphonate’s P-C-P bond for excellent in vivo stability

For further information about Osteoscan, please contact: Arnold Austin, Technical Manager, Professional Services Division, Procter & Gamble (513) 977-8547.

In Europe, contact: Philips-Duphar B.V., Cyclotron and Isotope Laboratories, Petten, Holland.

See following page for a brief summary of package insert.
Brief summary of Package Insert. Before using, please consult the full Package Insert included in every kit.

DESCRIPTION
Each vial of OSTEOSCAN contains 5.9 mg disodium etidronate and 0.16 mg stannous chloride as active ingredients. Upon addition of ADDITIVE-FREE 99mTc-pertechnetate, these ingredients combine with 99mTc to form a stable soluble complex.

ACTIONS (CLINICAL PHARMACOLOGY)
When injected intravenously, 99mTc-labeled OSTEOSCAN has a specific affinity for areas of altered osteogenesis. Areas of bone which are undergoing neoplastic invasion often have an unusually high turnover rate which may be imaged with 99mTc-labeled OSTEOSCAN.

Three hours after intravenous injection of 1 ml 99mTc-labeled OSTEOSCAN, an estimated 40-50% of the injected dose has been taken up by the skeleton. At this time approximately 50% has been excreted in the urine and 6% remains in the blood. A small amount is retained by the skeleton. The remainder of 99mTc-labeled OSTEOSCAN excreted in the feces is below the level detectable by routine laboratory techniques.

INDICATIONS
OSTEOSCAN is a skeletal imaging agent used to demonstrate areas of altered osteogenesis.

CONTRAINDICATIONS
None.

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

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

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

The 99mTc-generator should be tested routinely for molybdenum breakthrough and aluminum. If either is detected, the eluate should not be used.

PRECAUTIONS
Both prior to and following 99mTc-labeled OSTEOSCAN administration, patients should be encouraged to drink fluids. Patients should void as often as possible after the 99mTc-labeled OSTEOSCAN injection to minimize background interference from accumulation in the bladder and unnecessary exposure to radiation.

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.

ADVERSE REACTIONS
None.

DOSAGE AND ADMINISTRATION
The recommended adult dose of 99mTc-labeled OSTEOSCAN is 1 ml with a total activity of 10-15 mCi. 99mTc-labeled OSTEOSCAN should be given intravenously by slow injection over a period of 30 seconds within eight (8) hours after its preparation. Optimum scanning time is 3-4 hours postinjection.

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

TECHNETIUM-99M DTPA(TIN)
Brief summary of package insert. Before using, please consult the full package insert included in every kit.

DESCRIPTION
The kit contains 10 vials, each vial containing 5 mg sterile, pyrogen-free Sodium salt of Diethyleneetriamine-pentaacetic Acid (DTPA) and 0.25 mg Stannous Chloride. Administration is by intravenous injection for diagnostic use. The product as supplied is sterile and pyrogen-free.

When sterile, pyrogen-free Sodium Pertechnetate Tc 99m is added to the vial, a chelate, Technetium Tc 99m DTPA is formed.

HOW SUPPLIED
Diagnostic isotopes' Technetium Tc 99m DTPA Kit (Chelate) is supplied as a sterile, pyrogen-free kit containing 10 vials. Each vial contains 5 mg of Sodium salt of DTPA and 0.25 mg of SnCl2. The pH is adjusted with HCI or NaOH prior to lyophilization. Following lyophilization the vials are sealed under a nitrogen atmosphere.

CLINICAL PHARMACOLOGY
Following its intravenous administration, Technetium Tc 99m DTPA rapidly distributes itself throughout the extracellular fluid space from where it is (promptly) cleared from the body by glomerular filtration. There should be little or no binding of the chelate by the renal parenchyma. A variable percentage of the Technetium Tc 99m DTPA binds to serum proteins; this ranges from 3.7% following the single injection to approximately 10% if the material is continuously infused. Although the chelate gives useful information on the glomerular filtration rate, the variable percent which is protein bound leads to a measured glomerular filtration rate which is lower than the glomerular filtration rate as determined by inulin clearances. Technetium Tc 99m DTPA tends to accumulate in intracranial lesions with excessive neovascularity or an altered blood-brain barrier. The chelate does not accumulate in the choroid plexus.

Since Technetium Tc 99m DTPA is excreted by glomerular filtration, the images of the kidneys obtained in the first few minutes after injection represent the vascular pool within the kidney. Subsequent images of the kidneys represent radioactivity which is in the urine of both the collecting system and the renal pelvis.

INDICATIONS AND USAGE
Technetium Tc 99m DTPA may be used to perform kidney imaging, brain imaging, to assess renal perfusion, and to estimate glomerular filtration rate.

CONTRAINDICATIONS
None known.

WARNINGS
Technetium Tc 99m DTPA 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 radiopharmaceuticals, especially those elective in nature, of a woman of child-bearing capability should be performed during the first few (approximately 10) days following the onset of menses.

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

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.

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 DTPA 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 DTPA have been reported.

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

Kidney imaging and glomerular filtration rate estimation: 3 to 5 mCi.

Brain imaging or renal perfusion: 10 to 20 mCi.
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Perfusion + Ventilation: The two together are diagnostically better.

The ventilation-perfusion ratio \( \frac{V}{Q} \) is the crucial factor determining the regional oxygen partial pressure. This can be evaluated by assessing the gas exchange occurring in any part of the lung. The single most sensitive non-invasive test for diagnosing Pulmonary Embolus is the perfusion lung image. However, pulmonary diseases, such as chronic obstructive lung disease, infectious diseases, and neoplasms are all characterized by altered arterial blood flow. Therefore the most reliable way to increase the specificity of perfusion lung imaging is to add a Xenon 133 ventilation study.

PULMOLITE™ — Technetium Tc 99m
Aggregated Albumin Kit

Diagnostic — For Intravenous Use

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

Contraindications: Technetium Tc 99m aggregated albumin should not be administered to patients with severe pulmonary hypertension. The use of Tc 99m aggregated albumin is contraindicated in persons with a history of hypersensitivity reactions to products containing human serum albumin.

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

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

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

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

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

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

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

The contents of the vial are sterile and non-pyrogenic. It is essential that the user follow the directions carefully and adhere to strict aseptic procedures during preparation of the radiographic 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 age, a batch of Technetium Tc 99m aggregated albumin not be used after eight hours from the time of reconstitution. Refrigerate at 2° to 8°C after reconstitution. If blood is withdrawn into the syringe, unnecessary delay prior to injection may result in clot formation in situ.

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

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

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

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

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

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

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

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

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

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

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

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

Each vial contains 3.6-6.5 x 10^11 aggregated albumin particles.

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

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

Cat. No. NRP-415

Xenon Xe 133 Gas (CALIDOSE™)
Dispensing System.

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 radionuclides.

Precautions: As in the use of any other radioactive material care should be taken to insure minimum radiation exposure to the patient, consistent with proper patient management, and to insure minimum radiation exposure to occupational workers. Exposed Xenon Xe 133 gas should be controlled in a manner that is in compliance with the appropriate governmental regulations. Xenon Xe 133 adheres to some plastics and rubber and should not be allowed to stand in tubing or respirator lines. Such unrecognized loss of radioactivity from the dose for administration may render the study non-diagnostic. 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.

Dosage 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:

- 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 Calidoose™ system, consisting of 2 ml unit dose vials and the Calidoose 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.

*Patent Pending

Cat. No. NRP-186

New England Nuclear
Radiopharmaceutical Division
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Cardiac ejection fraction
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• The phantoms are unknowns—you can only tell what is inside through the imaging or scanning procedure.
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• The phantoms duplicate actual clinical situations.
• The phantoms are solid. No liquid is used, so there is no chance of spillage.

The phantoms are designed so results will be comparable if instruments are properly calibrated.
NOTE: An amendment must be obtained by those applicants having licenses from agreement states (except Broad Medical Type). Contact CAP Office for details.

Series Q /
RADIONUCLIDE IDENTIFICATION and ASSAY OF ACTIVITY
Shipments are in April and August
Each of two shipments will contain one unknown radionuclide for identification of principal constituent and possible radionuclidic impurities. The program will enable the participant to:
• Ascertain accuracy of calibration of gamma spectrometers and ionization chambers (dose calibrator).
• Acquire a radionuclide standard for daily calibration (in longer half-lived radionuclides).
• Use the sample for a teaching aid for residents and technicians.
• Obtain a report on the intercomparison of methodologies and instruments.
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The dual gating operation mode allows recording of both end-systole and end-diastole simultaneously in a split screen two image format.

The cardiac cycle can even be divided into nine equal time segments and the image corresponding to each displayed simultaneously in a nine image format.

The Cardiac Gate includes a complete electrocardiograph module. The built in heated stylus strip chart recorder records both the ECG trace and the gating intervals.

The Cardiac Gate provides both ECG and gating outputs for computer interface.

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Now also available for routine use as an adjunct in the diagnosis of acute myocardial infarction.

Anterior wall infarction, anterior view

Left anterior oblique

Left lateral

For brief summary of prescribing information, please see next page.
TechneScan® PYP™ Kit
(Stannous Pyrophosphate)

Kit for the Preparation of Technetium Tc 99m Stannous Pyrophosphate
Diagnostic—For Intravenous Use

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

One to two hours after intravenous injection of TechneScan PYP Tc 99m, an estimated 40 to 50 percent of the injected dose has been taken up by the skeleton, and approximately 0.01 to 0.02 percent per gram of acutely infarcted myocardium. Within a period of one hour, 10 to 11 percent remains in the vascular system, declining to approximately 2 to 3 percent twenty-four hours post injection. The average urinary excretion was observed to be about 40 percent of the administered dose after 24 hours.

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

As an adjunct in the diagnosis of confirmed myocardial infarction (ECG and serum enzymes positive), the incidence of false negative images has been found to be 6 percent. False negative images can also occur if the study is done too early in the evolutionary phase of the infarct or too late in the resolution phase. In a limited study involving 22 patients in whom the ECG was positive and serum enzymes questionable or negative, but in whom the final diagnosis of acute myocardial infarction was made, the incidence of false negative images was 23 percent. The incidence of false positive images has been found to be 7 to 9 percent. False positive images have also been reported following coronary by-pass graft surgery, in unstable angina pectoris, old myocardial infarcts and in cardiac confusions.

CONTRAINDICATIONS
None.

WARNINGS
This radiopharmaceutical should not be administered to patients who are pregnant or lactating unless the information to be gained outweighs the potential hazards. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

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

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

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

The contents of the TechneScan PYP reaction vial are intended only for use in the preparation of Technetium Tc 99m Stannous Pyrophosphate and are not to be directly administered to the patient.

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

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

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

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

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

Cardiac Imaging
Patient's cardiac condition should be stable before beginning the cardiac imaging procedure.

If not contraindicated by the cardiac status, patients should be encouraged to ingest fluids and to void frequently in order to reduce unnecessary radiation exposure.

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

ADVERSE REACTIONS
None.

DOSE AND ADMINISTRATION
The recommended adult dose of TechneScan PYP is:

1. Skeletal Imaging — 5 to 15 millicuries (1 to 14 milligrams stannous pyrophosphate).

2. Cardiac Imaging — 10 to 15 millicuries (4 to 7 milligrams of stannous pyrophosphate).

TechneScan PYP Tc 99m is injected intravenously over a 10- to 20-second period. For optimal results, bone imaging should be done 1 to 6 hours following administration. Cardiac imaging should be done 60 to 90 minutes following administration. The acute myocardial infarct can be visualized from 24 hours to 9 days following onset of symptoms, with maximum localization at 48 to 72 hours. Cardiac imaging should be done with a gamma scintillation camera. It is recommended that images be made of the anterior, left anterior oblique and left lateral projections.

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

HOW SUPPLIED
Catalog Number—094 TechneScan PYP Kit

Kit Contains:

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

Reaction Vial Contains:

15.4 mg Sterile Stannous Pyrophosphate (Lyophilized). Hydrochloric acid is added for pH adjustment prior to lyophilization.

5—Pressure-sensitive “Caution—Radioactive Material” labels.

5—Radioassay Information String Tags.
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<th>Capacity</th>
<th>Weight</th>
<th>Price</th>
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<tr>
<td>ULTRA-LITE</td>
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<td>1 cc</td>
<td>1.1 oz</td>
<td>$95.00</td>
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<td>56-293</td>
<td>5 to 6 cc</td>
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<tr>
<td>99mTc THIN-WALL</td>
<td>56-272</td>
<td>2½ to 3 cc</td>
<td>3.2 oz</td>
<td>$45.00</td>
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<td>56-273</td>
<td>5 to 6 cc</td>
<td>4.6 oz</td>
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VA Hospital, Alexandria, LA, AN Equal Employment Opportunity Employer, has an immediate staff vacancy for a Nuclear Medicine Technician, starting salary $9,500 or $11,523 dependent upon qualifications and experience, periodic salary increases and generous fringe benefit package. Interested candidates contact Personnel Service (46), VA Hospital, Alexandria, Virginia 22314. Area code 703, 442-0651, Ext. 356.

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COMPUTER SPECIALIST—VA Hospital—University of Colorado Medical Center. A research position is available in the Nuclear Medicine Research Laboratory of the Denver VA Hospital. The primary responsibility is to function as the computer and mathematics expert of the nuclear medicine research team. Additional training and experience in electrical engineering and/or physics is desirable. Faculty appointment in the University of Colorado Medical School is available. Applications from all interested persons are welcome. Inquiries, including curriculum vitae and reference list, should be sent to: William C. Klinkenimith III, M.D., Chief, Nuclear Medicine Research Laboratory, Veterans Administration Hospital, 1055 Clermont Street, Denver, Colorado 80220. The Veterans Administration is an Equal Opportunity Employer.


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University of Tennessee Center for the Health Sciences
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For further information, contact:
Rex B. Shafer, M.D., Chief, Nuclear Medicine Service (115), Veterans Administration Hospital, 54th St. & 48th Ave. So., Minneapolis, MN 55417

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Merle K. Loken, M.D., Ph.D., Director, Division of Nuclear Medicine, University of Minnesota Hospitals, Box 382, Mayo Memorial Building, Minneapolis, MN 55455

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