Technetium Tc 99m Generator

Secondary shield to further reduce radiation

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**TECHNETIUM 99m GENERATORS**

**Technetium Tc 99m Generators for the Production of Sodium Pertechnetate Tc 99m**

**DESCRIPTION:** The Technetium Tc 99m Generator is prepared with fission produced Molybdenum Mo 99 absorbed on aluminum in a lead-shielded column and provides a means for obtaining sterile, pyrogen-free solutions of Sodium Pertechnetate Tc 99m in sodium chloride injection. The eluate should be crystal clear. With a pH of 4.5-7.5, hydrochloric acid and/or sodium hydroxide may have been used for pH adjustment. Over the life of the generator, an elution will contain a yield of 90% to 100% of the theoretical amount of Technetium Tc 99m available from the Molybdenum Mo 99 on the generator column.

Each eluate of the generator should contain more than 0.15 microcuries of the Molybdenum Mo 99 per milliliter Technetium Tc 99m per administration dose at the time of administration, and not more than 10 micrograms of aluminum per milliliter of the generator eluate, both of which must be determined by the user before administration.

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

Sodium Pertechnetate Tc 99m is used in children as an agent for: brain imaging including cerebral radionuclide angiography, thyroid imaging, blood pool imaging including radionuclide angiography, and urinary bladder imaging (direct isotopic cystography) for the detection of vesico-ureteral reflux.

**CONTRAINDICATIONS:** None known.

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

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

**Carcinogenesis, Mutagenesis, Impairment of Fertility**

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

**Pregnancy Category C**

Animal reproductive studies have not been conducted with Technetium Tc 99m. It is also not known whether Technetium Tc 99m can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. Technetium Tc 99m should be given to a pregnant woman only if the expected benefit to the woman outweighs the potential hazards to the fetus.

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

**HOW SUPPLIED:** Sodium Pertechnetate Tc 99m is supplied as a Molybdenum Mo 99/Technetium Tc 99m generator in sizes from 330 milliunits up to 10,600 milliunits in approximately 330 microliter increments of Molybdenum Mo 99 as of 10:00 P.M. Eastern Time of the day of calibration. The TECHNETIUM Tc 99m GENERATOR consists of 1) sterile generator, 2) Sodium Chloride Injection source, 3) 10 cc sterile evacuated vials. 4) sterile needles. 5) sterile vial shields. 6) insulated drug labels. Elution vials in 5 cc and 20 cc sizes are available upon request

**INITIAL ORDER ONLY**

The TECHNETIUM Tc 99m GENERATOR should not be used after 16 days from the date and time of calibration.

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**June, 1983**

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This easy-to-use manual explains the indications and expected findings of nuclear medicine studies, compares them to other diagnostic modalities, and helps referring clinicians select the most appropriate studies. Unnecessary tests are reduced and the patient's stay can be shortened.

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See next page for brief summary.
PHOSPHOTEC®
Technetium Tc 99m Pyrophosphate Kit
For Diagnostic Use

DESCRIPTION: Each reaction vial contains 40 mg sodium pyrophosphate (equivalent to 23.9 mg anhydrous sodium pyrophosphate) and 0.4 mg stannous fluoride (minimum) and 0.9 mg total tin (maximum) as stannous fluoride; 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, nonpyrogenic sodium pertechnetate Tc 99m solution is added to the vial, a diagnostic agent, technetium Tc 99m pyrophosphate, is formed for intravenous administration; the structure of this radiolabeled complex is unknown.

The product as supplied is sterile and nonpyrogenic.

INDICATIONS AND USAGE: Bone Imaging
Phosphotec (Technetium Tc 99m Pyrophosphate Kit) may be used as a bone imaging agent to delineate areas of altered osteogenesis.

Cardiac Imaging
Phosphotec is a cardiac imaging agent used as an adjunct in the diagnosis of acute myocardial infarction. The infarction is best visualized one to six days after onset of symptoms. False-negative images can occur if imaging is done too early in the evolutionary phase of the infarct or too late in the resolution phase. The incidence of false-positives may range from 5 to 9 percent and of false-negatives from 6 to 9 percent but may vary even more depending on selection criteria of patient populations.

Blood Pool Imaging
Phosphotec is also a blood pool imaging agent which may be used for gated cardiac blood pool imaging.

CONTRAINDICATIONS: None known.

WARNINGS: Preliminary reports indicate impairment of brain scans using sodium pertechnetate Tc 99m injection which have been preceded by a bone scan using an agent containing stannous ions. The impairment may result in false-positive or false-negative brain scans. It is recommended, where feasible, that brain scans precede bone imaging procedures. Alternatively, a brain-imaging agent such as technetium Tc 99m pentetate may be employed.

PRECAUTIONS: General
The lyophilized contents of the Phosphotec reaction vial are to be administered to the patient only as an intravenous solution.

Any sodium pertechnetate Tc 99m solution which contains an oxidizing agent is not suitable for use with Phosphotec (Technetium Tc 99m Pyrophosphate Kit).

When reconstituted with sodium pertechnetate Tc 99m, Phosphotec must be used within 6 hours. When reconstituted with Sodium Chloride Injection USP for blood pool imaging, use the solution within 30 minutes.

Technetium Tc 99m pyrophosphate as well as other radioactive drugs must be handled with care, and appropriate safety measures should be used to minimize radiation exposure to the patient and occupational workers consistent with proper patient management.

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.

Bone Imaging
Both prior to and following administration of the technetium Tc 99m pyrophosphate, 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.

Cardiac Imaging
The patient's cardiac condition should be stable before beginning the cardiac imaging procedure. If not contraindicated by the patient's cardiac status, patients should be encouraged to drink fluids and to void as often as possible in order to reduce unnecessary radiation exposure to the bladder. Interference from chest wall lesions such as breast tumors and healing rib fractures can be minimized by employing the three recommended projections. False-positive and false-negative myocardial scans may occur; therefore, the diagnosis of acute myocardial infarction depends on the overall assessment of laboratory and clinical findings.

Blood Pool Imaging
The reconstituted agent should be injected by direct venipuncture. Heparinized catheter systems should be avoided, as interference with red blood cell tagging will result.

Carcinogenesis, Mutagenesis, Impairment of Fertility
No long-term animal studies have been performed to determine any carcinogenic potential or impairment of fertility in males or females.

Teratogenic Effects: Pregnancy Category C
Animal reproduction studies have not been conducted with technetium Tc 99m pyrophosphate. It is also not known whether technetium Tc 99m pyrophosphate can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Technetium Tc 99m pyrophosphate should be administered to a pregnant woman only if clearly needed.

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

Nursing Mothers
Caution should be exercised when technetium Tc 99m pyrophosphate is administered to a nursing woman. Technetium Tc 99m is excreted in human milk during lactation; therefore, formula-feedings should be substituted for breast-feedings.

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

ADVERSE REACTIONS: Some hypersensitivity reactions have been associated with pyrophosphate use.

HOW SUPPLIED: Phosphotec (Technetium Tc 99m Pyrophosphate Kit) is supplied in a kit containing 10 reaction vials (5 ml size).

For full prescribing information, consult package insert.

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Interpretation: Perfusion defect in superior segment of lower right lobe; smaller perfusion defects noted in left mid-lung and left upper lung field.

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5.0 mCi Xenon Xe 127 Gas. Performed immediately after perfusion study with patient in right posterior oblique position.

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Please see next page for Xenon 127 prescribing information.
CLINICAL PHARMACOLOGY

Xenon Xe 127 (and other radiocographs) is a readily diffusible gas which is neither utilized or produced by the body. It passes through cell membranes, freely exchanges between blood and tissue, and tends to concentrate in blood, plasma, water, or protein solutions. In the concentrations recommended for diagnostic use, xenon Xe 127 is rapidly absorbed into the body. Xenon Xe 127 gas will enter the pulmonary artery and enter the pulmonary venous circulation via capillaries. Most of the Xenon Xe 127 gas that enters the circulation during a single breath is retained to the lungs and exhaled after a single pass through the peripheral circulation.

INDICATIONS AND USAGE

Xenon Xe 127 gas has been shown to be valuable for diagnostic inhalation studies for the evaluation of pulmonary function and for imaging the lungs.

CONTRAINDICATIONS

WARNINGS

Xenon Xe 127 gas delivery systems, i.e., respirators or spirometers, are for use with non-radioactive radionuclides only. The delivery system must be capable of delivering gas at mean atmospheric pressure. The system must be capable of maintaining the proper concentration levels of the gas and be capable of delivering the gas in a manner that is compatible with the appropriate regulations of the government agency authorized to license the use of radionuclides. The radionuclides should be used only by physicians who are trained in the safe use and handling of radionuclides. A protocol for radiopharmaceuticals, including the use of those with long half-lives, that are approved by the appropriate government agency authorized to license the use of radionuclides must be followed.

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenesis, mutagenesis, or potential for whether this drug affects fertility in males or females.

Pregnancy Category C

Animal reproduction studies have been conducted with Xenon Xe 127 gas. It is not known whether Xenon Xe 127 gas can cause fetal harm when administered to pregnant woman or can affect reproduction capacity. Xenon Xe 127 gas should be given to a pregnant woman only if clearly needed.

Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Xenon Xe 127 gas is administered to a nursing woman.

Pediatric Use

Safety and effectiveness in children have not established.

ADVERSE REACTIONS

None known.

Dosage and Administration

Xenon Xe 127 gas can be administered by inhalation from a closed respiratory system or spirometer. The final patient dose should be measured by a suitable radiopharmaceutical calibration system immediately prior to administration. The recommended activity range employed for inhalation by the average patient (70 kg) is: pulmonary function including imaging: 5 to 10 milliCuries. This may be administered as a bolus into the tubing near the patient’s mouthpiece or mask after the completion of a tidal inspiration or after re-breathing for a period of approximately 5 minutes. This bolus should be administered within the air that was contained in the closed system at concentrations of the radiocarbon dioxide that may vary from 5 to 15 milliCuries per liter. Radiation Dosimetry

The estimated absorbed radiation doses to an average patient (70 kg) for inhalation studies from a maximum dose of 10 milliCuries of xenon Xe 127 in L, T, and 10 liters of air in a single breath (as shown in Table 5) are based on 90% total activity as Xenon Xe 127 with 10% activity as Xenon Xe 123 and 10% activity as Xenon Xe 131. The values are the maximum absorbed dose that could be anticipated under the given conditions.

Directions for Dispensing

Transfer the appropriate Xenon Xe 127 gas dose from the Xenon Xe 127 gas unit dose bottle to the breathing device or spirometer using an adequately shielded transfer device such as the Mallinckrodt, Inc. Xenon Xe 127 Dispenser, Catalog No. C49. Directions for use of this gas dispenser are as follows:

1. If required, attach nozzle or other appropriate connector to the low flow fitting of the Xenon Xe 127 Gas Dispenser.

2. Remove lead filled plastic cap from Xenon Xe 127 Gas unit dose bottle and expose the top of the 2.0 cm rubber nipple.

3. With valve in closed, insert into handle of the Xenon Xe 127 Gas Dispenser, impinging the valve on the needles and engaging the lock until the shield and valve in position.

4. Connect the Xenon Xe 127 Gas Dispenser to the breathing device.

5. Squeeze the trigger firmly and completely one or more times to transfer the gas from the vial into the breathing device.

6. After transfer, press shield release latch in the handle and remove the shield.

7. Pull the exhausted vial from the needles, place back into shield, replace plastic cap on the vial and discard with the labeled requirements for the disposal of radioactive waste.

8. Before reimpaling shield into the Xenon Xe 127 Gas Dispenser, engager the lock. This will prevent possible injury from uncontrolled release of gas.

9. To clean the Xenon Xe 127 Gas Dispenser, simply wipe with mild detergent. DO NOT IMMERSION IN WATER.

Radiocactivity Measurements

Calibrate a suitable commercial ionization chamber dose calibrator according to the manufacturer’s instructions for that particular instrument. An instrument that gives direct radiocactivity readouts will be preferred.

Use a National Bureau of Standards (NBS) Xenon Xe 127 standard as a standard that is traceable to an NBS standard for the initial calibration. Also establish a secondary standard, such as Barium Xe 123, at that time for subsequent routine use. Other suitable radionuclides may also be used. Determine the effectiveness of the secondary standard compared to the Xenon Xe 127 standard over the range of activities expected for routine measurements. Determine the radiocactivity of the dose for administration as follows:

1. Check the dose calibrator for proper response with the secondary standard.

2. Insert the Xenon Xe 127 Gas unit dose vial in the dose calibrator and measure the apparent radioactivity of the Xenon Xe 127.

3. Correct for decay as necessary.

The radiocactivity determined by this method is within 25% of the true value. This degree of accuracy includes variations attributed to small differences in geometry.

How Supplied

Xenon Xe 127 Gas is available in 2ml vials with color-coded labels in 5 milliCuries (Code 130) and 10 milliCuries (Code 131) sizes. Both sizes are packaged in individual lead shields.

Storage

Xenon Xe 127 Gas should be stored at 15°C to 30°C.

Storage and disposal of Xenon Xe 127 Gas must be controlled according to that is in compliance with the appropriate regulations of the government agency authorized to license the use of the radiocarbon dioxide.


3. Preparations of Xenon Xe 127 Gas may contain up to 10% of Xenon Xe 123 and 10% Xenon Xe 131 which will slightly reduce the fraction remaining.


5. Subjects bases on 90% total activity as Xenon Xe 127 with 10% activity as Xenon Xe 123 and 10% activity as Xenon Xe 131.

6. Values are available from Mallinckrodt for use with breathing devices or spirometers that have a recessed xenon injection port.

7. Xe 127 gas is available from Mallinckrodt, Inc. Post Office Box 5840 St. Louis, MO 63134

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Visit our Booth at the Annual SNM Meeting, June 5 - 8, Los Angeles.
A new approach to thallium-201 quantitation

David A. Chesler, ScD
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Physics Research Group, Massachusetts General Hospital

Gerald M. Pohost, MD
Director, Division of Cardiovascular Disease, and Professor of
Medicine and Radiology, University of Alabama at Birmingham

Charles A. Boucher, MD
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Robert D. Okada, MD
Assistant Professor of Medicine, Harvard Medical School
Assistat in Medicine, Massachusetts General Hospital

Michael V. Yester, PhD
Associate Professor of Diagnostic Radiology, University of
Alabama at Birmingham

Many studies have demonstrated that computer quantification and analysis may significantly increase the sensitivity and specificity of thallium-201 imaging, enhance the consistency of interpretation and, by providing information on regional clearance not obtainable from visual interpretation alone, better define the extent of ischemia in patients being evaluated for coronary artery disease.

We have developed a computer program for quantification and analysis of thallium-201 imaging data, which differs from other available programs in its assumptions about left ventricular geometry and its approach to such critical areas as image alignment for comparison of different regions over time and background subtraction. In addition, the program provides certain unique display features, such as a functional image, that facilitate communication between the performer of the study and the referring clinician.

The ventricular ellipse

In contrast to other programs, our program takes into account the essentially ellipsoid shape of the left ventricle and the fact that the myocardial wall has thickness. The operator establishes the angle and length of the long axis of the ventricular ellipse, and excludes the basal part of the image that represents the valve plane. Then the computer automatically defines the region of interest for each view as the area bounded by an outer ellipse corresponding to the epicardial surface of the ventricle and an inner ellipse representing the ventricular cavity. The operator determines the thickness of this region of interest by specifying the number of pixels to move in from the outer ellipse.

Next, the program automatically divides the area between the inner and outer ellipses into five segments, corresponding to the segments conventionally analyzed on coronary angiography: apex, inferior, inferobasal, anterobasal and anterolateral. The boundaries between segments are established by dividing the outer ellipse into five equidistant lengths, then dropping perpendiculars to the tangents at those five points.

We believe that using an elliptical instead of a circular region of interest and defining the segments based on that ellipse more accurately reflects the true shape of the left ventricle and accommodates the wide range of normal geometric variability in the population.

Automatic realignment

In order to compare initial with delayed images, or images made before and after some therapeutic intervention, the program automatically realigns subsequent images in each view by using a maximum-correlation analysis to obtain a best fit with the initial image. We believe that this feature of the program should lead to improved consistency of interpretation by eliminating a potential cause of inter- and intraobserver disagreement.

Background subtraction is performed after the automatic realignment. The computer subtracts background from every single pixel within the region of interest individually, based on the relation of each pixel to every single point just outside the outer ellipse—instead of determining an average background based on the extrapolation of a limited number of points.

Transmural activity

The program determines the count profile for each image by dropping a perpendicular from the tangent at 128 points around the outer ellipse. It then looks at activity along that perpendicular pixel by pixel and takes the mean of the three (or more, at the discretion of the operator) hottest consecutive pixels. Thus, instead of reflecting peak pixel activity around the myocardium or in horizontal cuts across the myocardium, the count profiles incorporate transmural change in activity across the thickness of the myocardium. The plotted profiles express these mean values for each image as a percentage of the hottest value and display the data both as continuous curves and as averages of each of the five individual segments. Delayed image data are normalized on the count profiles so that the same pixels that read 100 on the initial image read 100 on the delayed.
Information on regional thallium clearance is plotted and displayed separately from the count profiles. Using raw (nonnormalized) data, the program calculates the clearance time for each segment based on three time points in each segment. The computer automatically fits these three points to the best-fit monoexponential curve and shows the clearance time ($T^{1/2}$) in hours from peak activity.

**Functional image**

In addition to the processed images and count and clearance profiles, the program displays a three-color functional image for each view of the study. Normal segments—those that show no change between initial and delayed images—are displayed in red. Abnormal segments that demonstrate redistribution over time are shown in green, and segments with persistent defect are in black. We believe this functional image provides a succinct and graphic means of communicating the results of the study from the interpreter to the clinician who has ordered the study.

**Preliminary results**

We have already utilized this program in assessing the thallium studies of over 600 patients and are now beginning to publish our results.\(^1\)\(^3\) Our preliminary data suggest that the program compares favorably with other quantitative approaches to thallium imaging in providing accurate results and greater interobserver agreement, and in identifying ischemic regions on the basis of abnormal thallium clearance.

The advantages of the program are those we hoped to achieve in developing it: a region of interest that more accurately corresponds to the shape of the left ventricle; quantification of activity that accounts for the thickness of the myocardium; a more realistic approach to background subtraction; automatic image alignment; and a display that facilitates understanding of the data. We have obtained these advantages with no increase in required operator intervention.

The following are references to abstracts presented before the American College of Cardiology, 33rd Annual Scientific Session, March 25-29, 1984, Dallas, Texas:


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. 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.

Carcinogenesis, Mutagenesis, Impairment of Fertility: No long-term animal studies have been performed to evaluate carcinogenic potential or whether Thallous Chloride TI 201 affects fertility in males or females.

Pregnancy Category C: Animal reproductive studies have not been conducted with Thallous Chloride TI 201. It is also not known whether Thallous Chloride TI 201 can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Thallous Chloride TI 201 should be given to a pregnant woman only if clearly needed.

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

Nursing Mothers: 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.

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

Radiopharmaceuticals should be used only by physicians who are trained in the safe and proper handling of radionuclides and who have experience and training in accordance with the appropriate government agency authorized to license the use of radionuclides.

The expiration date for Thallous Chloride TI 201 is a maximum of five days post-calibration.

ADVERSE REACTIONS: A single adverse reaction to the administration of Thallous Chloride TI 201 has been reported consisting of hypotension accompanied by pruritus and a diffuse rash which responded to antihistamines and steroids within one hour.

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, in an upright posture, or after briefly ambulating.

Best results with thallium imaging performed in conjunction with exercise stress testing appear to be obtained if the thallium is administered when the patient reaches maximum stress and when the stress is continued for 30 seconds to one minute after injection. Imaging should begin within 10 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.

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 Chloride TI 201, 1mg/ml sodium chloride, and 1mg/ml of benzyl alcohol. The pH is adjusted to between 5–7 with hydrochloric acid and/or sodium hydroxide solution. Vials are available in the following quantities of radioactivity: 2, 4, and 6.8 milliequivalents of Thallous Chloride TI 201.

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Professor of Medicine and Radiology and
Staff Physician, Division of Nuclear Medicine, University of Maryland
School of Medicine.

Roger E. Linnemann, M.D., President, Radiation Manage-
ment Corporation; Clinical Associate Professor of
Radiology, University of Pennsylvania School of Medicine
Radiation Management Corporation provided technical and
medical support at Three Mile Island.

Neil Wald, M.D., Chairman, Department of Radiation Health,
Graduate School of Public Health, University of Pittsburgh; Radiation Medicine Consultant to Pennsylvania Secretary of Health.
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STAFF NUCLEAR MEDICINE TECHNOLOGIST. The University of Iowa Hospitals and Clinics, a 1,100-bed tertiary care center, has immediate openings for staff nuclear medicine technologists. Requires college degree or equivalent combination of education and experience. Must be registered or registry eligible. Full range of in vivo procedures and cardiovascular imaging section utilizing the most modern instrumentation. Opportunity for involvement in research projects is available. Responsibilities include clinical instruction in nuclear medicine technology program. Excellent career opportunities with competitive salary and comprehensive benefits package. Send resume or contact: John A. Bricker, Division of Nuclear Medicine, Department of Radiology, University of Iowa Hospitals and Clinics, Iowa City, IA 52242; Phone collect: (319) 356-892. The University of Iowa is an Equal Opportunity/Affirmative Action Employer.

POSITIONS WANTED

Board certified NUCLEAR MEDICINE PHYSICIAN with 18 yrs experience in nuclear medicine, nuclear cardiology, and internal medicine seeking to relocate in Southeast. All possibilities considered. Looking to join hospital, group, or clinic for full-time practice of nuclear medicine and/or internal medicine. Reply box 502, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 1006.


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Course Director: Stanley J. Goldsmith, M.D.

For further information contact: Ms. Mary Farrell-Batista—(212)650-7888.

Notice of Public Sale of CP-42 Cyclotron

Mallinckrodt, Inc., shall conduct an “as is, where is” public sale by sealed written bids of a Model CP-42, negative ion cyclotron system and supplementary spare parts manufactured by The Cyclotron Corporation (TCC) of Berkeley, California. The cyclotron system is being sold by Mallinckrodt, Inc. pursuant to rights as a secured party under the Uniform Commercial Code.

BID DEADLINE: Written bids must be received no later than August 1, 1984.

Interested parties may request Invitation to Bid instructions on or before August 1, 1984 from: Mallinckrodt, Inc., 675 McDonnell Blvd., St. Louis, MO 63134, Attention: D.H. Groetz, purchasing manager; or telephone (314) 959-2775; or telex 209-895 MALKY U; or telecopy (314)959-2979.

An information conference for prospective bidders shall be held at the above address on June 11, 1984 at 9 a.m.

TERMS: Cash or equivalent, or pre-approved credit. Cyclotron system will be sold as a unit or as component parts, as more fully set forth in the Invitation to Bid. The cyclotron system is being offered subject to rejecting any and all bids, and subject to withdrawal from sale.

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MPI DMSA Kidney Reagent (Technetium Tc 99m Succimer Kit)

DESCRIPTION: Each reagent ampul of the kit contains 2.2 ml of a sterile, pyrogen-free aqueous solution containing 1.2 mg of succimer and 0.42 mg of anhydrous stannous chloride in aqueous solution under a nitrogen gas atmosphere. When sterile, oxidant-free, pyrogen-free sodium pertechnetate Tc 99m in isotonic saline is combined with the reagent, following the instructions provided with the kit, a complex is formed. Administration is by intravenous injection for diagnostic use. The succimer component of MPI Kidney Reagent consists of more than 90% meso succimer and less than 10% d,l succimer.

INDICATIONS AND USAGE: MPI DMSA Kidney Reagent is to be used as an aid in the scintigraphic evaluation of renal parenchymal disorders.

CONTRAINDICATIONS: None known.

WARNINGS: None.

PRECAUTIONS: General

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

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

Pregnancy Category: D: Animal reproduction studies have not been conducted with the MPI DMSA Kidney Reagent with or without Tc 99m. It is also not known whether Technetium Tc 99m alone or with Succimer can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. Technetium Tc 99m should be administered to a pregnant woman only if clearly needed.

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

NURSING MOTHERS: Technetium Tc 99m is excreted in human milk during lactation, therefore, formula feedings should be substituted for breast-feeding.

PEDIATRIC USE: Safety and effectiveness in children have not been established.

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.

MPI DMSA Kidney Reagent should be formulated within 30 minutes prior to clinical use. The product must be used within 30 minutes after preparation. Any unused portion should be discarded after that time. Some patients with advanced renal failure may exhibit poor renal intake of Tc 99m DMSA. It has been reported that satisfactory images may be obtained in some of these patients by delaying imaging for up to 24 hours.

ADVERSE REACTIONS: Rare instances of syncope, fever, nausea and maculopapular skin rash have been reported.

HOW SUPPLIED: Each kit package contains the following components:

1. Five sterile glass reagent ampuls, each containing 2.2 ml of a sterile, pyrogen-free aqueous solution of 1.2 mg succimer and 0.42 mg anhydrous stannous chloride. The solution is under a nitrogen gas atmosphere.
2. Five sterile and pyrogen-free mixing vials (10 ml).
3. Five mixing vial labels.
4. Five courtesy recording labels.
5. One package insert.

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