NEOSCAN MEANS gallium citrate Ga 67 from Medi-Physics, Inc. Neoscan can aid in demonstrating the presence and extent of Hodgkin's disease, lymphoma and bronchogenic carcinoma. Positive uptake in the absence of prior symptoms warrants follow-up as an indication of a potential disease state.

NEOSCAN MEANS a gallium citrate Ga 67 that is produced by MPI on both the East and West Coasts and is available from 6 locations across the country for easy access when you need it. Neoscan is calibrated twice weekly in two convenient sizes: 3.0mCi and 13.2mCi.

NEOSCAN MEANS a gallium citrate Ga 67 that MPI will send to you with no additional delivery charge along with your supply of Sodium Iodide I 123, Technetium Prepared Products or Xenon 133-V.S.S. (xenon Xe 133).
With deliveries to meet your needs.

Contact the facility nearest you to arrange a standing order:
San Francisco (415) 656-2184
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(Outside Calif.) (800) 227-0483
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Houston (713) 641-5731
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Chicago (312) 671-5444
Toll Free (Outside Ill.) (800) 323-3906
New York/New Jersey (201) 757-0500
Toll Free (Outside N.J.) (800) 631-5367
Miami (305) 557-0400

Neoscan™
gallium citrate Ga 67

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

DESCRIPTION: Neoscan for diagnostic use is supplied as a sterile, pyrogenic aqueous solution for intravenous injection. Each milliliter of the solution contains 2 millicuries of gallium Ga 67 at calibration time, no-carrier-added. 2.5% sodium citrate, and 1% benzyl alcohol as a preservative. The pH is between 4.5-7.5. Gallium Ga 67, with a half-life of 78.1 hours, is produced by the proton irradiation of zinc 65-enriched zinc oxide. The radionuclidic composition, at calibration time, is not less than 98.9% of the total activity from gallium 67 with less than 1% of the total radioactivity due to gallium 66 and with zinc 65 and other radiocontaminants contributing less than 0.1% of the total activity.

INDICATIONS AND USAGE: Neoscan may be useful to demonstrate the presence and extent of Hodgkin's disease, lymphomas, and bronchogenic carcinoma. Positive gallium Ga 67 uptake in the absence of prior symptoms warrants follow-up as an indication of a potential disease state.

CONTRAINDICATIONS: None known.

WARNINGS: This radiopharmaceutical should not be administered to children or to patients who are pregnant or to nursing mothers unless the information to be gained outweighs the potential hazards. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, in women of child-bearing capability should be performed during the first few (approximately 10) days following the onset of menses.

PRECAUTIONS: A thorough knowledge of the normal distribution of intravenously administered gallium citrate Ga 67 is essential in order to accurately interpret pathologic studies. The finding of an abnormal gallium concentration usually implies the existence of underlying pathology, but further diagnostic studies should be done to distinguish benign from malignant lesions. Neoscan is intended for use as an adjunct in the diagnosis of certain neoplasms. Negative results do not preclude the presence of disease. Gallium citrate Ga 67 as well as other radioactive drugs, must be handled with care. Appropriate safety measures should be used to minimize radiation exposure to clinical personnel and to patients, consistent with proper patient management. No long-term animal studies have been performed to evaluate carcinogenic potential.

Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Gallium citrate Ga 67 should be used in pregnant women only when clearly needed. Gallium citrate Ga 67 has been found to accumulate in breast milk and should not be used in nursing mothers. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: No adverse reactions have been reported with the use of Neoscan at this time.

DOSAGE AND ADMINISTRATION: The recommended adult (70 kg) dose is 2-5 millicuries. Neoscan is intended for intravenous administration only. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration. Studies indicate the optimal tumor-to-background concentration ratios are often obtained about 48 hours after administration. However, considerable biological variability may occur in individuals, and acceptable images may be obtained as early as 6 hours and as late as 120 hours after injection. Approximately 10% of the administered dose is excreted in the feces during the first week after injection. Daily laxatives and/or enemas are recommended from the first day of injection until the final images are obtained in order to cleanse the bowel of radioactive material and minimize the possibility of false positive studies. Radiopharmaceuticals should be used only by persons 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.

HOW SUPPLIED: Neoscan is supplied as a no-carrier-added sterile pyrogenic aqueous solution for intravenous use. Each milliliter contains 2 mCi ± 10% gallium Ga 67 at the time of calibration with 2.5% sodium citrate. Benzyl alcohol 1% is present as a preservative. The pH is between 4.5-7.5. The contents of the vial are radioactive and adequate shielding and handling precautions must be maintained.
THE EASY WAY TO YOUR PATIENT'S HEART

- RAPID EASY PREPARATION¹
- EXCELLENT BINDING EFFICIENCY²
- STABLE FORMULATION²
- CONVENIENT USAGE METHODOLOGY¹
- CONSISTENT RESULTS²
- UNIT DOSE ECONOMY OR MULTIDOSE UTILITY

Technetium Tc 99m Normal Serum Albumin (Human) Reagent Kit

BRIEF SUMMARY OF PRESCRIBING INFORMATION

indications and usage
Technetium Tc 99m Human Serum Albumin is used as an agent for imaging the heart blood pool and to assist in the detection of pericardial effusion and ventricular aneurism.

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

warnings
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. This radiopharmaceutical preparation should not be administered to children or to patients who are pregnant or to nursing mothers unless the expected benefits to be gained outweigh the potential hazards.

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

precautions
The components of the kit are sterile and pyrogen-free. It is essential that the user follows the directions carefully and adheres to strict aseptic procedures during preparation of the radiodiagnostic. Technetium Tc 99m Human Serum Albumin must not be used after three hours from the time of formulation.

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 Human Serum 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.

Technetium Tc 99m Human Serum Albumin, 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.

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

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

how supplied
unit dose kit
The kit consists of 10 unit dose reaction vials each containing a lyophilized mixture of 7 mg human serum albumin and 0.06 mg stannous tartrate. Hydrochloric acid was added prior to lyophilization for pH adjustment.

multidose kit
The kit consists of 5 multidose reaction vials each containing a lyophilized mixture of 21 mg human serum albumin and 0.23 mg stannous tartrate. Hydrochloric acid was added prior to lyophilization for pH adjustment.

FOR FULL PREPARATION AND PRESCRIBING INFORMATION, SEE PACKAGE INSERTS.

Notes: ¹Refer to package insert for full preparation and prescribing information. ²Data on file at Union Carbide Corporation, Tuxedo, New York

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Everything medical imaging cameras should do, that is. Effortlessly. Automatically. Excellently, in over 1,000 new installations a year. Matrix video cameras embody the latest in video, optical and microprocessor technology. They handle the relatively diverse demands of ultrasound and nuclear computers as well as the special, high line rate requirements of CT or fluoroscopy reproduction. They give you quality images, from which you can diagnose confidently.

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Low* Dissolved Oxygen Non-preservative normal saline USP

Designed with Nuclear Medicine in mind, Low Dissolved Oxygen, non-preservative, normal saline for routine use is now available from Ackerman Nuclear, Inc.

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  Use for eluting Technetium-99m generators.

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  Use for diluting high specific concentrations of Technetium-99m.

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SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN

**DESCRIPTION:**
SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN is a sterile isotonic solution of sodium chloride in water for injection. It contains 0.9% sodium chloride and is packaged in single dose vials. The osmolarity is 300 mOsm/L, the dissolved oxygen content is less than 5 ppm.

**INDICATIONS:**
SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN is indicated for eluting, preparing and/or diluting pharmaceuticals that specify oxidants may cause adverse effects on the final product. SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN is also used as a fluid and electrolyte replenisher or as an irrigating solution.

**WARNING:**
Excessive amounts of sodium chloride by any route may cause hypopotassemia and acidosis. Excessive amounts by the parenteral route may precipitate congestive heart failure and acute pulmonary edema, especially in patients with cardiovascular disease, and in patients receiving corticosteroids or corticotropin drugs that may give rise to sodium retention. No antimicrobial agent has been added.

**PRECAUTIONS:**
Unused amounts should be discarded immediately following withdrawal of any portion of the contents.

**HOW SUPPLIED:**
Catalog No. S-25

SODIUM CHLORIDE INJECTION U.S.P. with LOW DISSOLVED OXYGEN

Each 10 ml single dose vial contains approximately 6 ml. Each ml contains 9 mg sodium chloride providing 0.154 mEq each of sodium and chloride ions. Total osmolarity 300 mOsm/L; pH between 4.5 and 7.0. Dissolved oxygen content less than 5 ppm. Contains no preservatives.

ACKERMAN NUCLEAR, INC.
445 W. Garfield Ave.
Glendale, Calif. 91204

1/78

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Decrease the amount of oxygen you add daily and reduce the effect of one more variable from your radiopharmacy. Use Low Dissolved Oxygen saline when preparing kits containing any stannous tin products.

*less than 5 ppm

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For additional information call or write to:

ACKERMAN NUCLEAR, INC.
Pharmaceuticals for Nuclear Medicine
445 W. Garfield Ave.
Glendale, CA 91204, USA
(213) 240-8555
An NEN commitment today
to nuclear medicine's tomorrow:

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industry leaders to convert its research
concepts into diagnostic agents for
routine clinical use. In the past seven
years, nuclear medicine has learned it
can depend upon New England
Nuclear.

In 1979, we are adding our fourth
cyclotron... so you can continue
to receive all the thallium-201 and
gallium-67 you need, when you
need it.

In 1982 — tomorrow, at nuclear
medicine's pace — we'll be putting the
industry's first linear accelerator into
production of these important isotopes
... and perhaps some new ones you
may come up with and help us develop
between now and then.

It takes great commitment to keep
pace with you, to meet your needs
for today while we're investing
so heavily in tomorrow.

If that commitment came easy, our
competitors wouldn't always be
behind us in meeting your needs.
But...

We're committed. We're New England Nuclear®
The never ending struggle for product popularity often leads a manufacturer to add gadgets. It's called "one-upmanship." We sometimes lose sight of what YOU, the user, wants.

By customer demand, Radx has gone "Back to Basics" and developed the Assayer 1, a simple dosecalibrator, a reliable dose-calibrator, an economical dosecalibrator. The return to basics does not require a return to the 1960's technology. The Assayer 1 is microprocessor controlled, totally solid state, with a method of isotope selection way ahead of its time (an optical scanner) which is so precise, reproducible, and reliable that it will soon be copied.

It is not a gadget, it calibrates doses accurately, with precision and unprecedented reliability. It's the Assayer 1—$2950. Call today for the last dosecalibrator you'll ever own.

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Displays percent of total radioactivity which appears as the bound or hydrolyzed fraction of radiopharmaceutical chromatographic separation. Measurement accuracy: ±0.3%. Self-contained, pre-programmed computer/counter designed to count, store, analyze and read out results digitally.

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Simple-to-perform procedure. Isotope energy independent and can be used for the analysis of any radioisotope or radiopharmaceutical.

Rapid
Analysis completed in 5-15 minutes. Calculation of results automatically programmed internally, independently of operator.
NUCLEAR IMAGES ON KODAK FILM: SHARP.
Obtaining high-quality images in nuclear medicine requires both skilled personnel and valuable time. Reason enough to record the information you require on Kodak NMB or NMC film.

**Sharp.** Kodak NMB (blue base) and NMC (clear base) films feature single-coated emulsions to eliminate parallax. Since they are orthochromatic and, therefore, sensitive to both blue and green CRT phosphors, they record all the information on blue or green cathode-ray tubes. The built-in halation control provides for the imaging of crisp sharp dots, resulting in images with clearly defined edges.

**Informative.** Whether you use a multi- or single-image format, Kodak NMB and NMC films have the "viewbox" quality that no other medium can match. The inherent contrast level and excellent resolution of these films enable dot concentration patterns to image both flow and uptake studies effectively.

**Durable.** Both films are coated on a tough 7-mil Estar base. These films resist curling or cracking and can form a convenient and reliable part of a patient’s record for years to come.

Kodak NMB and NMC films can be processed in 90 seconds and are available in a variety of sheet film sizes. If you would like to know more about these and other Kodak films for nuclear medicine, ask your Kodak Technical Sales Representative, or write: Eastman Kodak Company, Health Sciences Markets Division, Dept. 740-B, Rochester, New York 14650.

© Eastman Kodak Company, 1979
The never ending struggle for product popularity often leads a manufacturer to add gadgets. It's called "one-upmanship." We sometimes lose sight of what YOU, the user, wants.

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It is not a gadget, it calibrates doses accurately, with precision and unprecedented reliability. It's the Assayer 1—$2950.

Call today for the last dosecalibrator you'll ever own.

Radx
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FSH and LH RIA Kits

- Reproducible  - Specific  - Fast  - Stable tracer

Both FSH and LH Kits give optimally precise determinations in the regions of major clinical interest. Before release for sale, both kits must show a coefficient of variation of less than 6% on a control serum. Exclusive use of a resin strip treatment guarantees high performance of tracer throughout shelf-life.

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Clinical data obtained with the kits on normal menstrual cycles, post-menopausal women, amenorrheic women with and without ovarian failure as well as on normal men and those with primary testicular failure is fully published in the package insert. For a universal standard in gynecology testing you need only run once, insist on the Amersham advantage.

The Amersham advantage in FSH/LH RIA testing

Precision
As the uses for nuclear medicine continue to expand, the responsibilities of the nuclear physician and the radiologist will increase just as rapidly. Their services are requested in more and more disciplines. Picker gamma-camera systems have been designed to allow the physician to select and refine the views he needs. Picker Dyna® Camera accessories help our cameras to see more. As our systems have grown more sophisticated in their ability to deliver results, they've also become simpler to use and maintain.

**DynaCamera 4/15 takes the large view.** Within the DynaCamera 4 series, Picker's 4/15 becomes the nucleus of a nuclear medicine department. Its 15" (380 mm) detector brings high uniformity and exceptional system resolution. It can image lung and liver/spleen studies in one view — without a diverging collimator. It's ideal for cerebral and cardiac flow studies, lung perfusion studies, bone, liver/pancreas and kidney studies.

**DynaCamera 4/11 for unparalleled resolution — 3.6 mm FWHM.** DynaCamera 4/11 delivers big performance in small areas, and lets you visualize small lesions, often hidden, and shows larger lesions with clearer definition. With the 4/11, you can easily image the myocardium to locate and measure infarcts, get precise region placement in left ventricular ejection fraction studies, and obtain cardiac-output measurements.
Dyna®Mo: A department on wheels. As a high-resolution, mobile, battery-operated camera that extends the role of nuclear medicine to every part of the hospital, DynaMo is a great system to have around. Its high-resolution detector – 3.6 mm FWHM – makes it the equal of our finest small field of view cameras and its quick-change collimators, five-motion detector and integral tape recorder make it a virtual department in itself.

DynaCamera accessories expand the role of your department in important new directions. Your selection of the right DynaCamera 4 gives you the range of capabilities your nuclear medicine department needs – and your selection of the right DynaCamera 4 accessories takes even greater advantage of these capabilities. For example, our Cardiac Module used in conjunction with DynaMo or any DynaCamera 4 system, allows you to compute left-ventricular ejection fraction without the expensive services of a nuclear computer. Our Clinical Image Processor significantly improves upon your present methods of viewing, analyzing, photographing and recording images. The Picker Image Programmer makes it possible to record multiple images on a single piece of film. Our Compact Recording Camera, used with PIP, formats and photographs up to 90 images on a single film. And, we offer the widest selection of collimators in the industry, to give you the best speed, resolution, sensitivity and convenience.

Keeping your department ahead of the future. A modular DynaCamera 4 system is an investment in the future of nuclear medicine. As new technologies emerge from the laboratory, Picker gamma-camera systems will keep pace… and set it. Our investment in the future of nuclear medicine is rooted in 20 years of industry leadership through the concept of adding capabilities, not complications.

For full details, contact Picker Corporation, 12 Clintonville Road, Northford, CT 06472 (203-484-2711); or Picker International, 595 Miner Road, Highland Hts., OH 44143.
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Its high visibility lead glass offers the radiation protection of solid lead.

Offering optically clear, 360 degree visibility, Nuclear Pacific syringe shields are safe, lightweight and easy to handle. Equally important, their professional appearance reduces patient anxiety.

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Diagnostic Sterile Solution
ADDS A NEW INDICATION
Lymphoma
Hodgkin’s Disease
Bronchogenic Carcinoma
Focal Inflammatory Lesions

Abdominal (retroperitoneal, subphrenic) and thoracic abscesses
Osteomyelitis
Surgical or trauma wounds
Peritonitis
Cystitis
Active tuberculosis
Pyelonephritis

Now, the precise indications for gallium-67 imaging have been expanded by Mallinckrodt to include focal inflammatory lesions...

Gallium-67 has been shown to be useful as an adjunct in the diagnosis of focal areas of infection, such as abdominal (retroperitoneal, subphrenic) and thoracic abscesses, osteomyelitis, and surgical wounds.

A positive gallium-67 study usually indicates the presence of pathology. However, care must be taken to distinguish malignant from benign lesions. A negative study cannot be definitely interpreted as ruling out the presence of disease; therefore, a negative finding should always be supported by negative clinical findings and other diagnostic procedures.

Put Mallinckrodt Gallium Citrate Ga 67 in your active file... a good resource for diagnostic imaging.
Brief Summary:

**INDICATIONS AND USAGE**

Gallium Citrate Ga 67 may be useful to demonstrate the presence and extent of Hodgkin's Disease, lymphoma, bronchogenic carcinoma, and focal inflammatory lesions. Positive Gallium Ga-67 uptake in the absence of prior symptoms warrants follow-up as an indication of a potential disease state.

**CONTRAINDICATIONS**

None known.

**WARNINGS**

Gallium Citrate Ga 67 should not be administered to children or to patients who are pregnant or to nursing mothers unless the information to be gained outweighs the potential hazards. If this drug is administered to nursing mothers, artificial feeding should be temporarily substituted for the mother's milk. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of women of childbearing capability, should be performed during the first few (approximately ten) days following the onset of menses.

**PRECAUTIONS**

A thorough knowledge of the normal distribution of intravenous administered Gallium Citrate Ga 67 is essential in order to accurately interpret pathologic states. The finding of an abnormal Gallium Ga-67 concentration usually implies the existence of underlying pathology, but further diagnostic studies should be done to distinguish benign from malignant lesions. Gallium Citrate Ga 67 is intended for use as an adjunct in the diagnosis of certain neoplasms as well as focal areas of infection. Certain pathologic conditions may yield up to 40 percent false negative Gallium Ga-67 studies. Therefore, a negative study cannot be definitely interpreted as ruling out the presence of disease.

Adequate reproduction studies have not been performed in animals to determine whether the drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Gallium Citrate Ga 67 should be used in pregnant women only when clearly needed.

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 occupational workers.

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

**ADVERSE REACTIONS**

None have been reported.

**DOSEAGE AND ADMINISTRATION**

The recommended adult (70 kg) dose of Gallium Citrate Ga 67 is 2.5 mCi. Gallium Citrate Ga 67 is intended for intravenous administration only.

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

**HOW SUPPLIED**

Gallium Citrate Ga 67 sterile solution is available in 3 mCi, 6 mCi and 12 mCi vials on calibration date. Each ml contains 2 mCi of Gallium Ga-67 on the calibration date, as a complex formed from 8.3 mg gallium chloride Ga-67, 1.9 mg of sodium citrate, 7.8 mg of sodium chloride, 0.9% benzyl alcohol v/v as preservative. The pH is adjusted to between 5.5-8.0 with hydrochloric acid and/or sodium hydroxide solution.
GALLIUM CITRATE Ga 67
Injection
Diagnostic Sterile Solution
ADDS A NEW INDICATION
Lymphoma
Hodgkin’s Disease
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Abdominal (retroperitoneal, subphrenic) and thoracic abscesses
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Adequate reproduction studies have not been performed in animals to determine whether the drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Gallium Citrate Ga 67 should be used in pregnant women only when clearly needed.

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 occupational workers.

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

ADVERSE REACTIONS
None have been reported.

DOSE AND ADMINISTRATION
The recommended adult (70 kg) dose of Gallium Citrate Ga 67 is 2.5 mCi. Gallium Citrate Ga 67 is intended for intravenous administration only.

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

HOW SUPPLIED
Gallium Citrate Ga 67 sterile solution is available in 3 mCi, 6 mCi and 12 mCi vials on calibration date. Each ml contains 2 mCi of Gallium Ga-67 on the calibration date, as a complex formed from 8.3 ng gallium chloride Ga 67, 1.9 mg of sodium citrate, 7.8 mg of sodium chloride, 0.9% benzyl alcohol v/v as preservative. The pH is adjusted to between 5.5-8.0 with hydrochloric acid and/or sodium hydroxide solution.
Hands Off!
RIA Automation

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So automated it makes other RIA systems seem downright manual

1 No operator intervention from time samples and standards are loaded until tabulated results are collected.

2 High sample capacity, rapid throughput. Accepts 175 samples (no pretreatment necessary); processes at a rate of up to one per minute after initial sample run.

3 Entire procedure under advanced computer control. Automatically performs all the diverse and time-consuming steps of RIA...in a matter of minutes.

4 Floppy disk programming controls all assay parameters; has self-diagnostic capability. Dual drive disk carries over a half-million bytes of information.

5 Complete data reduction from sample identification to printing of standard curve.

6 Modular construction with minimum number of moving parts. Simplifies trouble-shooting, maintenance and servicing.

7 Versatile operation. Extensive instrument software allows quick changeover to other assay modalities, permits adaptability to other reagent sources.

8 Excellent reproducibility. For example, with cortisol 4.2% C.V. intra-assay, 5.4% C.V. inter-assay at mid-range.

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totally automates RIA

SQUIBB®
Top Quality Reagent Kits will be available for High-Volume Assays

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- ^125I labels facilitate sample preparation; avoid necessity of liquid scintillation counting equipment.
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- An extensive sales force to provide information and day-to-day customer service.
- Year-round seminars on RIA procedures and laboratory management conducted across the country. Another free service from Squibb.

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**Gammaflo®**
totally automates RIA
When Toshiba gave nuclear medicine the world’s first jumbo gammacamera in 1973, the medical community was very impressed. But we were dedicated to giving you more, so we introduced the world’s first jumbo gammacamera with high resolution, fine diagnostic detail over a large area. That was important, but we knew it still wasn’t enough.

Now, we are introducing the latest in the state-of-the-art, the GCA-402. The world’s first Super High Resolution, Large Field Gammacamera combining stability and exceptional workload capability in one instrument. Frankly, we’re pleased.

Toshiba’s system approach allows for no compromise where clinical diagnostic values are concerned. The GCA-402 is a prime example. High resolution is the basis for obtaining useful diagnostic images. The intrinsic resolution and linearity of the GCA-402, combined with its range of ten collimators provides unsurpassed images of exceptional diagnostic value. The GCA-402 incorporates 61 photo-multiplier tubes to electronically smooth the image and eliminate the high-energy collimator hole patterns unavoidable in conventional systems. Its 35cm field of view combined with 17 preselected isotope ranges allows unobstructed views of large organs, or groups of organs, as well as whole body scanning.

Toshiba’s patented* delay line system and modern IC-technology provide long term stability, trouble free performance, and ease of operation.

Of course, the GCA-402 has a wide range of accessories including special collimators, whole body scanning bed, video tape and film recorders, plus, the GCA-402 may be interfaced to any computer.

This combination of human engineering, fail-proof auto exposure and easy collimator changeover provides the highest efficiency while minimizing patient discomfort.

When you’re ready to fill your nuclear medicine department’s need for a large field gammacamera, remember Toshiba. We’re the first.

*Patented Delay Line, U.S. Patent Number 3,717,763

Our third is first again

Toshiba’s GCA-402 Jumbo Gammacamera

TOSHIBA
MEDICAL SYSTEMS
In Touch with Tomorrow

Division Of Toshiba International Corporation
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The four points that really matter when buying scintillation detectors. From the people who really know.

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Here at Harshaw, we have complete control of our crystal growth and processing — from careful synthesis and purification of the mother chemicals to patented forging and extrusion techniques.
Extensive testing ensures that each detector will function optimally in your application. Our meticulous technical approach consistently results in high-performance detectors that exceed all guaranteed performance specifications. In fact, a record 5.6% resolution was recently published for one of our sodium iodide detectors.

At Harshaw, we make scintillation crystals that set performance standards for the industry.

Mike Mayhugh, Ph.D.

"In-depth design consultation service."
We take pride in providing in-depth design consultation service. We'll help you not only by growing uniform, high-performance crystals, but designing the appropriate detector assembly. Tell us what your application and performance requirements are, and we'll design detector assemblies with any configuration to solve your problem.
All members of our large staff of dedicated scintillation experts have MS degrees or better. Our experience in measuring and guaranteeing detector performance under a variety of field conditions is enhanced by the extensive in-house computer-controlled performance and environmental test equipment.
You can depend on our advice, whether you need standard scintillators or a new, unique detector assembly.

M.R. Farukhi, Ph.D.
Over forty years ago Harshaw began experimenting with crystals. We had no idea how much we’d excel. But here we are. Today we’re the leader in sodium iodide scintillation detectors. And we’ve come up with a dozen other problem-solving crystals, too. We offer experience, in-depth service, and warranties which are second to none in the industry.

We also have a large group of multi-disciplined technical experts. They want to talk with you. But first, listen to what they have to say. They have four good reasons why it makes sense to buy detectors from Harshaw. After you hear them out, call them. And let them hear you out.

Call us at (216) 248-7400. Or write to The Harshaw Chemical Company, Crystal & Electronic Products, 6801 Cochran Road, Solon, Ohio 44139.

"Prompt delivery on standard and specialized detectors."
We know that there are times when you can’t afford to wait for a detector. To satisfy that demand we maintain the largest scintillation detector production facilities in the field, and a comprehensive inventory of standard detectors. We deliver them within one week of receipt of your order.

For detectors not in stock, simply tell us what you want and we’ll quote a firm, minimum-time delivery date.

At Harshaw we know you need quality and delivery. We make it our business to give you the best of both.

"Guaranteed performance and reliability."
All Harshaw detectors come with two warranties. First, detector resolution and other requirements are mutually agreed upon by you and Harshaw. The detectors are guaranteed to meet or exceed those specifications. Photomultiplier tubes carry the manufacturers’ warranty extended from date of shipment by Harshaw.

Secondly, when used in a normal laboratory environment, they carry a two-year warranty against malfunction due to faulty construction or failure of hermetic seal.

At Harshaw we have confidence in our products, and we’re proud to back them up.

Philip Parkhurst, Field Sales Manager

Elmer Stewart, Vice President
The Harshaw Chemical Company
If you're getting all these advantages from your TSH RIA Kit, you must be using ours.

Quick reliable results
Tests are completed in one working day—with excellent reproducibility within and between batches.

Room Temperature Incubation
Eliminates the use of a water bath for the incubation stages.

Colour coding reduces missed tubes
And indicates adequate mixing of reagents.

New TSH RIA Kit
Examine the advantages of our new kit for yourself, and discover the optimum balance we have achieved in assay performance, reliability and service.

The Radiochemical Centre Amersham
“Glucoheptonate offers...”
**GLUCOSCAN**

**Technetium Tc 99m Glucenate Sodium Kit**

**FOR DIAGNOSTIC USE**

**DESCRIPTION:** New England Nuclear's GLUCOSCAN*® Technetium Tc 99m Glucenate Sodium Kit is supplied sterile and non-pyrogenic in lyophilized kit form suitable for reconstitution with sodium pertechnetate Tc 99m to form a diagnostic imaging agent for intravenous administration. Each vial contains 200mg glucenate sodium, 0.07mg maximum tnt and 0.06mg stannous chloride. Prior to lyophilization, hydrochloric acid and/or sodium hydrosulphide solution may be added to adjust the pH.

**PHYSICAL CHARACTERISTICS:** Technetium Tc 99m decays by isomeric transition with a physical half-life of 6.62 hours (SOURCE: Martin M.J., Nuclear Data Project ORNL, March 1976). Photons that are useful for imaging studies are listed in Table 1.

**Table 1. Principal Radiation Emission Data**

<table>
<thead>
<tr>
<th>Radiation</th>
<th>Disintegration</th>
<th>Max Energy (keV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma</td>
<td>88.96</td>
<td>140.5</td>
</tr>
</tbody>
</table>

To facilitate correction for physical decay of Technetium Tc 99m, the fractions of initial activity that remain at selected intervals after the time of calibration are shown in Table 2.

**Table 2. Technetium Tc 99m Physical Decay Chart**

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Half-Life 0.62 Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>Remaining</td>
</tr>
<tr>
<td>0*</td>
<td>1000</td>
</tr>
<tr>
<td>1</td>
<td>891</td>
</tr>
<tr>
<td>2</td>
<td>794</td>
</tr>
<tr>
<td>3</td>
<td>708</td>
</tr>
<tr>
<td>4</td>
<td>631</td>
</tr>
</tbody>
</table>

**EXTERNAL RADIATION:** The specific gamma ray constant for Technetium Tc 99m is 0.8R/mC-hr at 1 cm. The first half-value thickness of lead (Pb) is 0.2mm. A range of values for the relative attenuation of the radiation emitted by this radionuclide that results from interposition of various thicknesses of lead is shown in Table 3. For example, the use of a 6.3mm thickness of lead will attenuate the radiation by a factor greater than 10^−6.

**Table 3. Radiation Attenuation by Lead Shielding**

<table>
<thead>
<tr>
<th>Shield Thickness (Pb)</th>
<th>Coefficient of Attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>0.95</td>
<td>10^-1</td>
</tr>
<tr>
<td>1.8</td>
<td>10^-2</td>
</tr>
<tr>
<td>2.1</td>
<td>10^-3</td>
</tr>
<tr>
<td>3.6</td>
<td>10^-4</td>
</tr>
<tr>
<td>4.5</td>
<td>10^-5</td>
</tr>
<tr>
<td>5.4</td>
<td>10^-6</td>
</tr>
<tr>
<td>6.3</td>
<td></td>
</tr>
</tbody>
</table>

**CLINICAL PHARMACOLOGY:** Technetium Tc 99m Glucenate Sodium has been shown by comparative renograms to concentrate in the kidney by both glomerular filtration and tubular secretion. Kinetic studies have shown that while some of the activity is rapidly cleared through the urine, the remainder is retained in the renal cortex. In humans, about 25% of the injected dose is excreted in the urine during the first hour post-injection. Within the same interval, blood activity rapidly clears to less than 2% of the injected dose.

Technetium Tc 99m Glucenate Sodium has also been shown to localize in areas of intrarenal pathology characterized by a disturbance in the blood brain barrier. The mechanism is probably non-specific since neoplasms, cerebrovascular accidents and extracerebral hematomas have all shown pronounced radionuclide uptake. Used in conjunction with dynamic flow studies, Technetium Tc 99m Glucenate Sodium may detect vascular stenoses and arteriovenous malformations. There is no concentration of the agent by the salivary glands or the choroid plexus.

**INDICATIONS:** Technetium Tc 99m Glucenate Sodium is used for brain imaging. Technetium Tc 99m Glucenate Sodium is indicated for renal perfusion imaging as an adjunct in the diagnosis, localization, evaluation and follow-up of kidney disease. It may provide useful information about renal size, shape and position and may delineate lesions affecting renal blood flow.

**CONTRAINdications:** None known.

**Warnings:** The contents of the GLUCOSCAN kit are intended only for use in the preparation of Technetium Tc 99m Glucenate Sodium and are NOT to be directly administered to the patient.

Ideally examinations using radiopharmaceuticals—especiallly those elective in nature—of a woman of child-bearing capability should be performed during the first ten days following her last menstrual period. Dehydration and/or patient positioning may result in failure to visualize urinary excretory structures in the presence of normal function. Adequate patient fluid intake and repositioning may reduce the incidence of such false positive studies.

**PReCAUTIONS:** Technetium Tc 99m Glucenate Sodium, as well as any radioactive material, must be handled with care. Once reconstituted Technetium Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to clinical personnel.

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

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

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

No long term animal studies have been performed to evaluate carcinogenic potential. Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has any adverse effects on the fetus. Technetium Tc 99m Glucenate Sodium should be used in pregnant women only when clearly needed.

It is not known whether this drug is excreted in human milk. As a general rule, nursing should not be undertaken when a patient is administered radioactive material.

Safety and effectiveness in children have not been established.

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

**DOSAGE AND ADMINISTRATION:** The recommended dose for the average (70kg) adult patient is 10-20 millicuries for both renal and brain imaging. Technetium Tc 99m Glucenate Sodium is intended for intravenous administration only.

Technetium Tc 99m Glucenate Sodium should be used within eight hours after aseptic reconstitution with sodium pertechnetate Tc 99m. For optimal results, this time should be minimized. The reaction vial contains no bacteriostat. Optimal results for both renal and brain imaging are obtained one hour after administration. Studies have shown that although optimal target-to-background ratios for brain lesions are obtained at two hours post-injection, there is no improvement in diagnostic efficacy after one hour.

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

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

**RADIATION DOSIMETRY:** The estimated radiation absorbed doses to the average adult patient (70kg) from an intravenous injection of a maximum dose of 20 millicuries of Technetium Tc 99m Glucenate Sodium are shown in Table 4.

**Table 4. Radiation Absorbed Doses**

<table>
<thead>
<tr>
<th>Tissue</th>
<th>Absorbed Dose (Rad)</th>
<th>Maximum Dose (millicuries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidneys</td>
<td>3.4</td>
<td>20</td>
</tr>
<tr>
<td>Liver</td>
<td>0.2</td>
<td>20</td>
</tr>
<tr>
<td>Bladder wall</td>
<td>5.60</td>
<td>20</td>
</tr>
<tr>
<td>Ovaries</td>
<td>0.32</td>
<td>20</td>
</tr>
<tr>
<td>Testes</td>
<td>0.2</td>
<td>20</td>
</tr>
<tr>
<td>Whole body</td>
<td>0.15</td>
<td>20</td>
</tr>
</tbody>
</table>

**Apx历史:** NEN's GLUCOSCAN Technetium Tc 99m Glucenate Sodium Kit is supplied as a set of five or thirty vials, sterile and non-pyrogenic. Each vial contains 200mg sodium pertechnetate Tc 99m.

**INSTRUCTIONS FOR PREPARATION OF TECHNETIUM Tc 99m GLUCOSCAN SODIUM KIT:** To adequately inject the 3 to 7m of sodium pertechnetate Tc 99m into the supplied vial of GLUCOSCAN after placing vial in a radiation shield. Swirl for several seconds to dissolve completely. Label shield appropriately. Use within eight hours of reconstitution.

When using proper shielding, the vial containing the reconstituted solution should be visually inspected to insure that it is clear and free of particulate matter.

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

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

**Catalog Number NRP-180 (5 vial kit)**

**Catalog Number NRP-180C (30 vial kit)**
“Glucoheptonate offers...”
A 67-year-old female patient was referred for a brain scan two weeks following bilateral carotid endarterectomy, shortly after onset of left-sided weakness and slurred speech. $^{99m}$Tc gluceptate sodium images made two hours postinjection clearly demonstrate several areas of abnormally increased uptake in the right parietal and temporal regions, yielding the impression of multiple emboli. A repeat study with $^{99m}$Tc sodium pertechnetate made five days later at three hours postinjection revealed the same lesions, although the lower target-to-background ratio of sodium pertechnetate clearly diminishes appreciation of abnormal areas.
Considered superior to sodium pertechnetate, DTPA
Published studies by Léveillé et al, Rollo et al and Waxman et al compared Technetium Tc 99m gluceptate sodium (glucoheptonate) to sodium pertechnetate and/or Technetium Tc 99m DTPA. Their findings:

24% higher target-to-background ratio
"The results of the computer background study for 99mTc GH versus 99mTcO₄ show an average calvaria/brain ratio of 2.1 and 1.6 for 99mTc GH and 99mTcO₄, respectively, at 90 minutes after injection." Rollo et al²

May detect lesions not seen with other agents
"... 99mTc glucoheptonate concentrates in all lesions which accumulate 99mTcO₄ or 99mTc DTPA, and in certain cases, appears to localize lesions which do not concentrate other agents." Rollo et al²

When compared to pertechnetate... "Glucoheptonate offers a significant improvement in lesion detection (for both infarcts and tumors)." Waxman et al³

Optimal imaging at 90 minutes postinjection, without KC1O₄
"99mTc glucoheptonate combines the absence of oral activity with the convenience of obtaining highly diagnostically accurate images at 90 minutes." Rollo et al²

GLUCOSCAN
Technetium Tc 99m Gluceptate Sodium Kit
FOR DIAGNOSTIC USE

DESCRIPTION: New England Nuclear's GLUCOSCAN® Technetium Tc 99m Gluceptate Sodium Kit is supplied sterile and non-pyrogenic in lyophilized kit form suitable for reconstitution with sodium pertechnetate Tc 99m to form a diagnostic imaging agent for intravenous administration. Each vial contains 200mg of sodium, 0.07mg maximum tin and 0.06mg (min.) stannous chloride. Prior to lyophilization, hydrochloric acid and/or sodium hydroxide solution may be added to adjust the pH.

PHYSICAL CHARACTERISTICS:
Technetium Tc 99m decays by isomeric transition with a physical half-life of 6.02 hours (SOURCE: Martin, M.J., Nuclear Data Project, ORNL, March, 1976). Photons that are useful for imaging studies are listed in Table 1.

Table 1. Principal Radiation Emission Data

<table>
<thead>
<tr>
<th>Energy (keV)</th>
<th>Mean Energy Disintegration (keV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma-2 88.9</td>
<td>140.5</td>
</tr>
</tbody>
</table>

To facilitate correction for physical decay of Technetium Tc 99m, the fractions of initial activity that remain at selected intervals after the time of calibration are shown in Table 2.

Table 2. Technetium Tc 99m Physical Decay Chart; Half-Life 6.02 Hours

<table>
<thead>
<tr>
<th>Hours Remaining</th>
<th>Fraction</th>
<th>Hours Remaining</th>
<th>Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.000</td>
<td>5</td>
<td>0.562</td>
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<tr>
<td>1</td>
<td>891</td>
<td>6</td>
<td>501</td>
</tr>
<tr>
<td>2</td>
<td>794</td>
<td>7</td>
<td>447</td>
</tr>
<tr>
<td>3</td>
<td>708</td>
<td>8</td>
<td>398</td>
</tr>
<tr>
<td>4</td>
<td>631</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Calibration Time

EXTERNAL RADIATION:
The specific gamma ray constant for Technetium Tc 99m is 0.89 mCi/hr at 1 cm. The first half-value thickness of lead (Pb) is 0.22 mm. A range of values for the relative attenuation of the radiation emitted by this radionuclide that results from interception of various thicknesses of lead is shown in Table 3. For example, the use of a 3.0 mm thickness of lead will attenuate the radiation by a factor greater than 10^-7.

Table 3. RadiationAttenuation by Lead Shielding

<table>
<thead>
<tr>
<th>Lead Thickness (mm)</th>
<th>Coefficient of Attenuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>0.95</td>
<td>0.10</td>
</tr>
<tr>
<td>1.8</td>
<td>0.10</td>
</tr>
<tr>
<td>2.7</td>
<td>0.10</td>
</tr>
<tr>
<td>3.6</td>
<td>0.10</td>
</tr>
<tr>
<td>4.5</td>
<td>0.10</td>
</tr>
<tr>
<td>5.4</td>
<td>0.10</td>
</tr>
<tr>
<td>6.3</td>
<td>0.10</td>
</tr>
</tbody>
</table>

CLINICAL PHARMACOLOGY: Technetium Tc 99m Gluceptate Sodium has been shown by comparative renograms to concentrate in the kidney by both glomerular filtration and tubular secretion. Kinetic studies have shown that while some of the activity is rapidly cleared through the urine, the remainder is retained in the renal cortex. In humans, about 25% of the injected dose is excreted in the urine during the first hour post-injection. Within the same interval, blood activity rapidly clears to less than 2% of the injected dose.

Technetium Tc 99m Gluceptate Sodium has also been shown to localize in areas of intracranial pathology characterized by a disturbance in the blood brain barrier. The mechanism is probably non-specific since neoplasms, cerebrovascular accidents and extracerebral hematomas have all shown pronounced radionuclide uptake. Used in conjunction with dynamic flow studies, Technetium Tc 99m Gluceptate Sodium may detect vascular stenoses and arteriovenous malformations. There is no concentration of the radionuclide in the kidney. If the radionuclide is found in the urine, it is excreted by the kidney. The total amount of radionuclide excreted is less than 5% of the administered dose.

INDICATIONS AND USAGE: Technetium Tc 99m Gluceptate Sodium is being used for brain imaging.

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

CONTRAINICATIONS: None known.

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

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

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

PRECAUTIONS: Technetium Tc 99m Gluceptate Sodium, as well as any radioactive agent, must be handled with care. Once sodium pertechnetate Tc 99m is added to the kit, appropriate safety measures should be used to minimize external radiation exposure to the clinical personnel. Care should also be taken to minimize radiation exposure to patients in a manner consistent with proper patient management.

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

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

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

Although the Technetium Tc 99m Gluceptate Sodium is a radiopharmaceutical, it is not radioactive and therefore it is not expected to affect the biological distribution of the prepared agent. The agent, and its use is not recommended.

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

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

DOSEAGE AND ADMINISTRATION: The recommended dose for the average (70kg) adult patient is 10-20 millicuries for both renal and brain imaging. Technetium Tc 99m Gluceptate Sodium is intended for intravenous administration only.

Technetium Tc 99m Gluceptate Sodium should be used within eight hours after aseptic reconstitution with sodium pertechnetate Tc 99m. For optimal results, this time should be monitored.

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

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

The components of the New England Nuclear GLUCOSCAN Kit are supplied sterile and non-pyrogenic. Aseptic procedures normally employed in making additions and withdrawals from sterile, non-pyrogenic containers should be used.

RADIATION DOSEMISTRY:
The estimated radiation absorbed doses to an average adult patient (70kg) from an intravenous injection of a maximum dose of 20 millicuries of Technetium Tc 99m Gluceptate Sodium are shown in Table 4.

Table 4. Radiation Absorbed Doses

<table>
<thead>
<tr>
<th>Tissue</th>
<th>Absorbed Dose</th>
<th>Rads</th>
<th>20 millicuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidneys</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bladder Wall</td>
<td>5.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovaries</td>
<td>0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Testes</td>
<td>0.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whole Body</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Sodium, pertechnetate—200mg
- Maximum Tin—0.07mg
- Stannous Chloride (mm/lb) = 0.06mg

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

INSTRUCTIONS FOR PREPARATION OF TECHNETIUM Tc 99m GLUCEPTATE SODIUM KIT: Aseptically inject 3 to 7mls of sodium pertechnetate Tc 99m into the supplied vial of GLUCOSCAN after placing vial in a radiation shield. Swirl for several seconds to dissolve completely. Label shield appropriately. Use within eight hours of reconstitution.

Using proper shielding, the vial containing the reconstituted solution should be visually inspected to ensure that it is clear and free of particulate matter.

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

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

Catalog Number NRP-180 (5 vial kit)
Catalog Number NRP-180C (30 vial kit)
2 more reasons for making Diagnostic Isotopes your kit company

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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.

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The interview excerpted here was conducted with Glen W. Hamilton, M.D., Chief, Nuclear Medicine Section, Veteran's Administration Hospital, Seattle, Washington. Dr. Hamilton is also an Associate Professor of Medicine, University of Washington School of Medicine.

Q. Of the nuclear cardiology studies available in clinical practice today, which are the most difficult to interpret?

A. Thallium images are probably the most difficult to interpret, and pyrophosphate are probably the next. In about 60% of all abnormal studies, the abnormality is quite obvious. The remaining 40% are quite difficult to read. As the physician gains experience, he will be able to read about half of those with confidence, but about 20% of all thallium studies remain difficult to interpret. Experienced observers will have legitimate disagreement as to whether a given study is normal or abnormal.

Q. Which of these tests are generally the best in the assessment of left ventricular function? Is this also the best study for assessing wall motion?

A. The multiple gated blood pool study yields the greatest clinical information compared to the difficulty of performing the test and, therefore, is the one we use in our clinical practice when we wish to assess a patient's ventricular function. The best study for assessing wall motion is probably the multiple gated study. It is not perfect, in that the right ventricle and the left ventricle overlap in all but the LAO view... but for most laboratories it is the most practical way to assess wall motion.

Q. What studies would you recommend to a nuclear physician or cardiologist beginning nuclear cardiology in a community hospital?

A. I would recommend two studies: multiple gated blood pool studies, and thallium imaging. The ventricular function measurements obtained from multiple gated studies are useful not only in patients who have suspected coronary disease, but also in a wide variety of other patients, such as people with lung disease, older patients who have undetected ventricular dysfunction, or presurgical patients. Clearly, this is going to be the largest volume study, and that's the place where they should start. After doing resting ventricular function studies, they should progress to thallium imaging. Six months from now, there should be enough data available on rest/exercise ventricular function studies using multiple gated imaging to indicate whether this technique is of general usefulness.

Q. Which studies are the most difficult to perform?

A. Pyrophosphate studies are obviously the simplest to perform. The multiple gated blood pool study is performed quite simply. However, the equipment required is not present in every laboratory at the present time. Thallium, being a less ideal isotope, is probably the most difficult study, in terms of the technique required to achieve good diagnostic results.

Q. What may be the single most important use of these nuclear cardiology studies in five years?

A. First, I'm confident we will be noninvasively measuring ventricular function in a wide range of patients with various disease states — coronary artery disease, cardiomyopathy, chronic lung disease, valvular heart disease and many others. We will be able to follow these patients, correctly select the optimal time for surgical intervention, and alter medical therapy so that treatment is optimal. There's no question that this will happen. Secondly, if these tests turn out to be quite sensitive for the detection of coronary artery disease in its early presymptomatic stages, it may be possible to alter that disease by various interventions. This could become a very important national endeavor which could have far-ranging effects on health in this country.

Q. How widespread do you see these techniques becoming?

A. The need for studies of ventricular function will be comparable to the need for lung or bone scans. I really expect that most existing nuclear medicine laboratories, and, generally any hospital of two or three hundred beds, will be able to perform ventricular function studies within the next several years.

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RADIOPHARMACEUTICAL CHEMIST: The University of Maryland is soliciting applicants for a joint appointment in the department of radiopharmaceuticals and medicine. Applicants must be experienced in the development of new radiopharmaceuticals. Salary and academic rank dependent on background experience. Please send curriculum vitae to: Dr. Ralph Blomster, Chairman, Department of Medicinal Chemistry and Pharmacognosy, School of Pharmacy, University of Maryland at Baltimore, 636 W. Lombard Street, Baltimore, Maryland 21201.

NUCLEAR MEDICINE PHYSICIAN. THE Division of Nuclear Medicine in the Hospital of the Univ. of Pennsylvania has an opening at the Asst. Prof. level. Strong background in both clinical and research experience desirable. Well equipped Division with modern imaging instruments, computers and a cardiovascular Nuclear Medicine facility in the ICU area. PET scanner will be installed shortly. Excellent research opportunities. Contact Agass Alavi, M.D., Chief, Nuclear Medicine, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia, PA. 19104.

REGISTERED NUCLEAR MEDICINE TECHNOLOGIST. Registered X-Ray Technician or MT (ASCP) NM, with imaging experience for Midwestern mobile medical scanning service. Position requires daily travel to area hospitals with mobile equipment. Will train as necessary. Salary commensurate with experience. Excellent corporate fringe benefits. Positions available immediately in Sioux Falls, S. Dak., Mankato, Minn. or Des Moines, Ia. Send resume to Arlo Flanders, Laboratory of Clinical Medicine, 1212 S. Euclid Avenue, Sioux Falls, S. Dak. 57105. Or call (800) 643-8411.

REGISTERED NUCLEAR MEDICINE TECHNOLOGIST. Enjoy year-round, outdoor living in sunny Florida and challenge of being with an unusually progressive department in a modern 550+ bed hospital. This is a permanent, full-time position. We provide excellent experience and opportunity for continued learning in all phases of in vivo and in vitro procedures - including computer applications. Requests for further information should be directed to: Virginia Paine (or call her collect at) Holy Cross Hospital, 4725 North Federal Highway, Fort Lauderdale, Florida 33308. (305) 771-8000 Ext. 7392.

NUCLEAR MEDICINE PHYSICIAN. A position is available for a physician with an interest in nuclear imaging. Responsibilities will include undergraduate and resident teaching, as well as a complete range of clinical work. Certification in diagnostic radiology or nuclear medicine is required. This is an associate position in a well established and expanding service. Contact: Dr. W. St. Germain, Department of Radiology, University of Alberta Hospital, 112 Street and 83 Avenue, Edmonton Alberta T6G 2B7, Canada. Telephone: (403) 438-0687.


CHIEF OF NUCLEAR MEDICINE wanted. Nuclear medicine specialty to act as Chief of Nuclear Medicine Division at the University of Florida College of Medicine. A minimum of one year's training in nuclear medicine is required. Board certification in Radiology preferred but will consider candidates with training in Internal Medicine. Experience in nuclear cardiology is desirable. Rank and salary depending on qualifications and experience. Deadline is August 24, 1979. Position available after July 1, 1979. Send curriculum vitae to: Clyde M. Williams, Chairman, Department of Radiology, University of Florida College of Medicine, J. Hills Miller Health Center, Gainesville, Florida, 32610. An Equal Opportunity/Affirmative Action Employer.

SEEKING RADIOLOGIST WITH SPECIAL COMPETENCE IN MEDICAL PHYSICS for position with 8 radiologists associated in practice in general hospitals with 550 beds, teaching, Personnel in Radiology Department - 45. 80,000 radio-diagnostic, nuclear medicine, ultrasound, and computed tomography per year. No therapy. Send curriculum vitae to: Paul K. Segrist, M.D., 18390 Roscoe Blvd., Suite 320, Northridge, CA. 91324, (213) 993-8365.

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NUCLEAR MEDICINE TECHNOLOGIST available for immediate opening as a certified nuclear technologist. Teaching hospital with excellent fringe benefits. Excellent salary and employee benefits. Send resumes to Personnel Department, Central Community Hospital, 5701 South Western, Chicago, Illinois 60636. (312) 737-4600.

NUCLEAR MEDICINE TECHNOLOGIST. Full time day shift positions available for a Registered or Registry Eligible Nuclear Medicine Technologist. Full range of in vivo procedures - three gamma cameras with computer. Akron General Medical Center is a 550 bed medical center located near downtown Akron, Ohio. Good salary and employment benefits. Send to: Personnel Department, Akron General Medical Center, Personnel Department, 400 Wabash Avenue, Akron, Ohio 44307, (216) 384-7632. Equal Opportunity Employer M/F.

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NUCLEAR MEDICINE RESIDENT. Two year Residency Program in Nuclear Medicine at the New York Hospital-Cornell Medical Center. Position available July 1, 1980. Contact Jerome G. Jacobstein, M.D., Division of Nuclear Medicine, The New York Hospital-Cornell Medical Center, 525 East 68th Street, New York, New York 10021.

NUCLEAR MEDICINE TECHNOLOGIST. Immediate openings in expanding 167 bed hospital for experienced tech or recent grad registry eligible. Salary commensurate with experience. Excellent benefits package. Submit resume to: Personnel Director, Box 340, Cookeville, Tennessee 38501, or call Allison (collect) (615) 528-2541. An equal opportunity employer.

CHIEF OF NUCLEAR MEDICINE. Wanted. Nuclear medicine specialist to act as Chief of Nuclear Medicine at the V.A. Hospital affiliated with the University of Florida College of Medicine. A minimum of one year's training in nuclear medicine required. Board certification in Radiology preferred but will consider candidates with training in Internal Medicine. Experience in nuclear cardiology desirable. Rank and salary depending on qualifications and experience. Position available anytime after July 1, 1979. Send curriculum vitae to Clyde M. Williams, Chairman, Department of Radiology, University of Florida College of Medicine, J. Hillis Miller Health Center, Gainesville, Florida, 32610.

POSITIONS WANTED.

NUCLEAR PHYSICIAN SEeks RELOCATION. Certified ABNM, ABR. Currently Chief Nuclear Medicine 500 bed hospital. Reply to Box 700, Society of Nuclear Medicine, 475 Park Ave., New York, N.Y. 10016.

REGISTERED NUCLEAR MEDICINE Technician (ARRT) with B.S. Degree and 15 yrs. experience, includes setting up a department. Desires position as an instructor, preferably clinical also would consider research. Desire employer to pay moving expenses from New York State. Available in August. Reply: Box 701, Society of Nuclear Medicine, 475 Park Avenue South, New York, N.Y. 10016.

TECHNOLOGISTS AVAILABLE. August 1979: Graduating from Mayo Foundation, Rochester, Minnesota; four-year NMT Degree Program. Contact: Michael Sinclair, NMT or Nancy Hockett, NMT, Nuclear Medicine Section, Mayo Foundation Rochester, Minnesota 55901 (507) 284-3055.

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Volume 20, Number 7

49A
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Desired qualifications: Proven excellence in teaching and in all aspects of clinical Nuclear Medicine, plus research experience. Excellent opportunity for advancement. Stanford University is an equal opportunity employer and welcomes nominations from women and minority group members and applications from them.

Interested persons please send complete curriculum vitae including names and addresses of 5 referees to:

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(4) Medical writer

For information contact John A. Burdine, M.D., Chief, Nuclear Medicine Section, Departments of Internal Medicine and Radiology, 6720 Bertner Avenue, Houston, TX 77030; phone 713/521-2272.

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CONTACT: Juan M. Taveras, M.D., Radiologist-in-Chief or H. William Strauss, M.D., Nuclear Medicine Division, Department of Radiology, Massachusetts General Hospital, Boston, Massachusetts 02114.

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The program will be approved for credit toward the AMA Physicians' Recognition Award under Continuing Medical Education Category I.

For further information, contact: S. Treves, M.D., Chief, Division of Nuclear Medicine, Children's Hospital Medical Center, 300 Longwood Avenue, Boston, MA 02115 - Telephone: (617) 734-6000, extension 3366.

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State University of New York
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Left anterior oblique.

Left lateral.

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Imaging with 99mTc-pyrophosphate is an extremely sensitive technique, useful as an adjunct in determining the presence, location and extent of acute myocardial infarctions.

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See next page for brief summary.
PHOSPHOTEC®
Technetium Tc 99m Sodium Pyrophosphate Kit
DESCRIPTION: Phosphotec provides all the nonradioactive components required to prepare a sterile, nongenogenic technetated (99mTc) pyrophosphate-sodium complex. Each reaction vial contains 40 mg sodium pyrophosphate (equivalent to 23.9 mg anhydrous sodium pyrophosphate) and 1 mg stannous fluoride, the product does not contain a preservative. When sterile, nongenogenic sodium pertechnetate Tc 99m is added to the reaction vial, a technetated (99mTc) pyrophosphate-sodium complex is formed.

INDICATIONS AND USAGE: Technetated (99mTc) pyrophosphate-sodium complex may be used as a bone imaging agent to delineate areas of altered osteogenesis. It is also a cardiac imaging agent used as an adjunct in the diagnosis of acute myocardial infarction.

CONTRAINDICATIONS: None known.

WARNINGS: This product should not be administered to patients who are pregnant or to nursing mothers unless the benefit 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 (approx. 10) days following the onset of menses.

It has been reported that false-positive or false-negative cardiac scans may result when cardiac 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 bone scans are indicated along with imaging of bone or myocardial imaging, the bone scan should be performed first, if feasible. Alternatively, another bone imaging agent, such as Tc 99m DTPA, may be employed. 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.

The contents of the Phosphotec reaction vial are intended to be used only for preparation of the 1V solution and are not to be directly administered to the patient. Any sodium pertechnetate 99mTc solution which contains an oxidizing agent is not suitable for use with Technetium Tc 99m Sodium Pyrophosphate Kit. The contents of the kit are not radioactive. However, after sodium pertechnetate 99mTc is added, adequate shielding of the final preparation must be maintained. Technetated (99mTc) pyrophosphate-sodium complex must be used within 12 hours after reconstitution.

PRECAUTIONS: In the use of any radioactive material, care should be taken to minimize radiation exposure to the patient and occupational workers consistent with proper patient management. Both prior to and following administration of the technetated (99mTc) preparation, 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 if not contraindicated by the patient’s cardiac status. The patient’s cardiac condition should be stable before beginning the cardiac imaging procedure. Interference from chest wall lesions such as breast tumors and healing rib fractures can be minimized by employing three projections (e.g., anterior, lateral, and left anterior oblique).

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. This drug 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 this radiopharmaceutical have been reported.

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THE JOURNAL OF NUCLEAR MEDICINE
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References:
2. Forstrom L et al: Data on file at New England Nuclear, Medical Diagnostics Division, North Billerica, MA

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(Formerly Known as MDP)

DESCRIPTION: New England Nuclear's OSTEOLITE™ Technetium Tc 99m Medronate Sodium Kit (formerly known as MDP), is supplied sterile and non-pyrogenic in lyophilized kit form suitable for reconstitution with sodium pertechnetate Tc 99m to form a diagnostic skeletal imaging agent for intravenous administration. Each vial contains 10mg medronate disodium and 0.85mg stannous chloride dithydrate; pH is adjusted between 7.0-7.5 with hydrochloric acid and/or sodium hydrosulfide solution. The contents of the vial are lyophilized and stored under nitrogen.

PHYSICAL CHARACTERISTICS:
Technetium Tc 99m decays by isomeric transition with a physical half-life of 6.02 hours. (SOURCE: Martin, M. J. Nuclear Data Project, Oak Ridge National Laboratory, March, 1976) Photos for useful for imaging studies are listed in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Principal Radiation Emission Data—Technetium Tc 99m</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean %</td>
<td>Mean %</td>
</tr>
<tr>
<td>Photon</td>
<td>Disintegration</td>
</tr>
<tr>
<td>Gamma-2</td>
<td>98.96</td>
</tr>
</tbody>
</table>

To facilitate correction for physical decay of Technetium Tc 99m, the fractions of initial activity that remain at selected intervals after the time of calibration are shown in Table 2.

<table>
<thead>
<tr>
<th>Table 2. Physical Decay Chart: Technetium Tc 99m Half-Life 6.02 Hours</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction Remaining</td>
<td>Hours</td>
</tr>
<tr>
<td>0*</td>
<td>1,000</td>
</tr>
<tr>
<td>1</td>
<td>883</td>
</tr>
<tr>
<td>2</td>
<td>.794</td>
</tr>
<tr>
<td>3</td>
<td>.708</td>
</tr>
<tr>
<td>4</td>
<td>.631</td>
</tr>
<tr>
<td>5</td>
<td>.562</td>
</tr>
<tr>
<td>6</td>
<td>.501</td>
</tr>
<tr>
<td>7</td>
<td>.447</td>
</tr>
</tbody>
</table>

*Calibration Time

EXTERNAL RADIATION

The specific gamma ray constant for Technetium Tc 99m is 0.68/ 
MCi-hr. at 1cm. The half value layer is 0.2nm of Pb. To facilitate control of radiation exposure from solutions of Technetium Tc 99m, the use of a 0.35mm thick standard radition exclusion lead shield will attenuate the radiation emitted by a factor greater than 10^4.

<table>
<thead>
<tr>
<th>Table 3. Radiation Attenuation By Lead Shielding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shield Thickness (R)mm</td>
<td>Coefficient of Attenuation</td>
</tr>
<tr>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>0.95</td>
<td>10^-1</td>
</tr>
<tr>
<td>1.8</td>
<td>10^-2</td>
</tr>
<tr>
<td>2.7</td>
<td>10^-4</td>
</tr>
<tr>
<td>3.6</td>
<td>10^-6</td>
</tr>
<tr>
<td>4.5</td>
<td>10^-8</td>
</tr>
<tr>
<td>5.4</td>
<td>10^-10</td>
</tr>
<tr>
<td>6.3</td>
<td>10^-12</td>
</tr>
</tbody>
</table>

CLINICAL PHARMACOLOGY:

Upon intravenous injection, Technetium Tc 99m OSTEOLITE exhibits a specific affinity for areas of altered osteogenesis. In humans, blood levels fall to 4-10% of the injected dose by two hours post-injection and to 3-5% by three hours. During the first 24 hours following its uptake of the Technetium Tc 99m in bone appears to be related to osteogenic activity and to skeletal blood perfusion. The deposition in the skeleton is bilaterally symmetrical, with increased accumulation in patients with normal renal function. 50-70% of the radioactivity is excreted into the urine and less than 2% of the injected dose remains in the vascular system.

The use of technetium sodium chloride as a diluent for sodium pertechnetate Tc 99m may adversely affect the biologic distribution of the prepared agent, and its use is not recommended. Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Technetium Tc 99m medronate sodium should be used in pregnant women only when clearly needed.

It is not known whether this drug is excreted in human milk. As a general rule nursing should not be undertaken when a patient is administered radioactive material. Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: None reported.

DOSEAGE AND ADMINISTRATION: The recommended dose for the average 70kg adult patient is 5mCi with a range of 10-30mCi. The patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

Optimal imaging results are obtained within one to four hours after administration. OSTEOLITE should be used within six hours after reconstitution with sodium pertechnetate Tc 99m. For optimum results, this time should be minimized.

The vial contains no bacteriastat.

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

RADIATION DOSIMETRY:

The estimated absorbed radiation dose to a patient (70kg), from an intravenous injection of a reconstituted dose of 20 millicuries of Technetium Tc 99m OSTEOLITE is shown in Table 4.

<table>
<thead>
<tr>
<th>Table 4. Absorbed Radiation Dose</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Technetium Tc 99m Medronate Sodium</td>
<td></td>
</tr>
<tr>
<td>(organ/20mCi)</td>
<td></td>
</tr>
<tr>
<td>Total Body</td>
<td>0.13</td>
</tr>
<tr>
<td>Bone Total</td>
<td>0.70</td>
</tr>
<tr>
<td>Red Marrow</td>
<td>0.56</td>
</tr>
<tr>
<td>Kidneys</td>
<td>0.62</td>
</tr>
<tr>
<td>Liver</td>
<td>0.16</td>
</tr>
<tr>
<td>Bladder Wall</td>
<td>2.30</td>
</tr>
<tr>
<td>4.8 hr void</td>
<td>2.30</td>
</tr>
<tr>
<td>Ovaries</td>
<td>0.24</td>
</tr>
<tr>
<td>2 hr void</td>
<td>0.34</td>
</tr>
<tr>
<td>Testes</td>
<td>0.16</td>
</tr>
<tr>
<td>4.8 hr void</td>
<td>0.22</td>
</tr>
</tbody>
</table>


NOW SUPPLIER: New England Nuclear Technetium Tc 99m Medronate Sodium Kit is supplied in a set of five or thirty vials, sterile and non-pyrogenic. Each nitrogen-flushed vial contains in lyophilized form:

Medronate Disodium—10mg
Stannous Chloride Dihydrate—0.25mg

The pH is adjusted between 7.0-7.5 with hydrochloric acid and/or sodium hydrosulfide solution. The contents of the vial were lyophilized under nitrogen. Store at room temperature (15°-30°C). Included in each five (5) vial kit is one (1) package insert and six (6) radiation labels. Included in each thirty (30) vial kit is one (1) package insert and thirty-six (36) radiation labels.

INSTRUCTIONS FOR PREPARATION OF TECHNETIUM Tc 99m OSTEOLITE: Aseptically inject 2 to 8ml of sodium pertechnetate Tc 99m (pertechnetate in isotonic saline with or without a bacteriastat) into the supplied vial of OSTEOLITE enclosed by a radiation shield. Swirl for at least ten seconds to dissolve completely. Label appropriately. Suitable labels have been supplied with each OSTEOLITE Kit. Use within six hours after reconstitution. For optimum results, this time should be minimized.

Using proper shielding, the vial containing the reconstituted solution should be visually inspected to ensure that it is clear and free of particulate matter.

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

Catalog Number NRP-420 (5 vial kit)
Catalog Number NRP-420C (30 vial kit)
Brief summary of Package insert. Before using, please consult the full Package insert included in each kit.

Description: Each vial of OSTEOSCAN contains 5.9 mg etidronate disodium, 0.16 mg stannous chloride and 0.06 mg sodium ascorbate as active ingredients. Upon addition of ADDITIVE-FREE sodium pertechnetate Tc99m the etidronate disodium and stannous chloride combine with Tc99m to form a stable soluble complex.

Clinical pharmacology: When injected intravenously, Tc99m-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 Tc99m-labeled OSTEOSCAN. Three hours after intravenous injection of Tc99m-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 soft tissue. The level of Tc99m-labeled OSTEOSCAN excreted in the feces is below the level detectable by routine laboratory techniques. Tc99m-labeled OSTEOSCAN is not detectable in areas of necrosis and severely injured myocardial cells. Approximately 1.5 hours following intravenous injection 0.01-0.02 percent of the administered dose per gram of tissue is taken up by an acutely infected myocardium.

Indications: OSTEOSCAN is a skeletal imaging agent used to demonstrate areas of altered osteogenesis and a cardiac imaging agent used as an adjunct in the diagnosis of acute myocardial infarction. When used as an adjunct in the diagnosis of myocardial infarction the incidence of false negatives has been found to be approximately 14% and false positives about 16%. False negatives may result from failure to observe temporal requirements for good myocardial imaging; false positives may be related to coronary heart disease, left ventricular aneurysms, trauma, repeated cardioversion following coronary bypass surgery or old myocardial infarcts.

Contraindications: None known.

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. The technetium used to tag the product should be routinely tested for molybdenum and aluminum. If an unacceptable level of either is found, the technetium should not be used. 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.

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: Before and following Tc99m-labeled OSTEOSCAN administration, patients should be encouraged to drink fluids. Patients should void as often as possible after the Tc99m-labeled OSTEOSCAN 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 an ordinary diet 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 known.

Dosing and administration: The recommended adult dose of Tc99m-labeled OSTEOSCAN is 10-15 mCi. The activity of each dose should be measured by a suitable radiation calibration system just prior to administration. The dose should be given intravenously by slow injection. For optimal results bone imaging should be done 2-4 hours post injection and cardiac imaging 1-1.5 hours post injection. The acute myocardial infarct can be visualized from 1-9 days following onset of symptoms with maximum uptake at 2-3 days. It is recommended that three projections of the heart be made (antero, left anterior oblique and left lateral).

For additional information, call or write Procter & Gamble, Professional Services, P.O. Box 85507, Cincinnati, Ohio 45201, (513) 977-5547.
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The spartan panel above tells the second-best part of our story. If you want to photograph peak systole, press the SYSTOLE button. If, say, you want systole only at full expiration, press the EXPIRATION button as well. If only breathing is relevant, don't press the heart button.

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