Extended expiration—
Expiration time is increased to 12 hours after time of calibration.

Better patient dosimetry—Improved radionuclidian purity reduces patient radiation exposure.
SPECTamine®
Lofetamine HCl 123 Injection

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

**Diagnosis—For Intravenous Use**

**Description:** SPECTamine® lofetamine HCl 123 Injection is supplied as a sterile, pyrogenic, aqueous, isotonic sodium chloride solution for intravenous administration. Each milliliter of the solution contains 37 megabequerels (1 milliliter) of lofetamine HCl 123 at calibration time, 0.15 milligram iodine HCl, 0.017 millimole sodium phosphate, and 8.0 milligrams sodium chloride for isotonicity. The pH is adjusted to 4.5-6.0 with sodium hydroxide or hydrochloric acid. SPECTamine® contains no bacteriostatic preservative and is packaged in single-dose vials. The radiolucic composition at calibration time is not less than 98.0 percent I 123, not less than 9.9 percent I 125, and not more than 0.1 percent all others (I 126 and Te 121). The radiolucic composition at the 12-hour expiration time is not less than 98.3 percent I 123, not more than 3.5 percent I 125, and not more than 0.2 percent all others.

**Indications and Usage:** SPECTamine® lofetamine HCl 123 Injection is recommended for use as a lipoid-soluble brain-imaging agent. It has been shown to be useful in the evaluation of nonviable stroke especially when used with 96 hours of onset of focal neurological deficit. The rate of agreement between abnormal images and the neurological examination suggestive of ischemic cerebrovascular insufficiency appears to increase with the severity of symptoms. Its usefulness for the measurement of cerebral blood flow has not been established.

**Contraindications:** None known.

**Warnings:** SPECTamine® lofetamine HCl 123 Injection should not be administered to individuals with known hypersensitivity to sympathomimetic amines or to those individuals taking monoamine oxidase inhibitors.

**Precautions:**

Some primate (Macaca fascicularis) studies have shown marked eye uptake of iodine HCl 123. Localisation has not been studied in the primate eye although in vivo human studies suggest the concentration of iodine HCl 123 is below the limit of detection. Individual human variations in pharmacokinetics of this drug and the long-term effect on the eye have not been elucidated.

The contents of the vial are radioactive. Adequate shielding of the preparation must be maintained at all times. Do not use after the expiration date and date (12 hours after calibration time) stated on the label. Potassium Iodine Oral Solution should be administered before the examination to minimize thyroid uptake of iodine HCl 123.

The prescribed lofetamine HCl 123 dose should be administered as soon as practical from the time of receipt of the product (i.e., as close to calibration time or before, if possible), in order to minimize the fraction of radiation exposure due to relative increase of radionuclidic contaminants with time.

To minimize radiation dose to the bladder, the patient should be encouraged to drink fluids and void frequently.

SPECTamine®, as well as other radioactive drugs, must be handled with care. Appropriate safety measures should be used to minimize radiation exposure to personnel. Care should also be taken to minimize radiation exposure to the patient 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.

**Drug Interactions**

There has been a single report of elevated diastolic hypertension (about 30 mm Hg) occurring 18 hours after administration of SPECTamine® in a patient maintained on therapeutic doses of valproic acid.

Concurrent use of monoamine oxidase (MAO) inhibitors and compounds containing the amphiphatic structure has been known to result in hypertensive crisis. Caution, therefore, should be exercised when administering SPECTamine® (lofetamine HCl 123 injection) to individuals taking medications known to potentiate the effects of sympathomimetic amines. It is recommended that SPECTamine® not be administered during or within 14 days following administration of MAO inhibitors.

Symptomametic amines may affect the biodistribution of SPECTamine® and, thus, may influence the image quality and diagnostic utility of the image.

**Carbohydrates, Metabolism, Impairment of Fertility**

No long-term animal studies have been performed to evaluate carcinogenic potential, mutagenic potential or effects on fertility in male or female animals. The Ames test was negative for mutagenic effects.

**Pregnancy Category C**

Animal reproduction studies have not been conducted with SPECTamine®. As it is not known whether SPECTamine® can cause fetal harm when administered to a man or a pregnant woman or can affect reproduction capacity, SPECTamine® should be given to a pregnant woman only if clearly needed.

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

**Hormone Alterations**

Since iodine I 123 is excreted in human milk, formula feeding should be substituted for breast feeding if the agent must be administered to the mother during lactation.

**Pediatric Use**

Safety and effectiveness in children have not been established.

**Adverse Reactions:** In a clinical study in 593 patients with sudden onset of focal neurological deficit, e.g., cerebral infarction, 7 patients died within 2 to 55 days after administration. The deaths were considered to be a result of the disease state. Although there was no concurrent control group, statistics from historical controls support this evaluation.

There is evidence suggesting that the administration of 1 to 2 milligrams of iodine HCl, the carrier in SPECTamine® may increase systolic blood pressure by about 10 mm Hg. In a patient with a history of hypertension, there has been a single report of sudden onset of hypertension and dizziness with transient chest tightness which occurred 5-10 minutes after administration of SPECTamine®. One case of transient uncal herniation was also reported several hours after the use of SPECTamine® in a patient with a coincidental upper respiratory infection.

As with all organic iodine-containing compounds, the possibility of allergic reactions must be considered.

**How Supplied:** SPECTamine® is supplied in nominal 3.5 ml vials as a sterile, pyrogenic, aqueous, isotonic sodium chloride solution for intravenous injection. Each milliliter contains 37 megabequerels (1 milliliter) of iodine HCl 123 at calibration time. It is available in individual vials containing 111 megabequerels (3 milliliters) of iodine HCl 123 at calibration time in a nominal 3.5 ml vial. Single use vials are packaged in individual lead shields with plastic outer container.
NRC REQUIREMENT:

“A licensee shall survey for removable contamination, once each week, all areas where radiopharmaceuticals are routinely prepared for use, administered or stored.”

NUCLEAR REGULATORY COMMISSION
Publication 10 CFR 35, "Medical Use of By-Product Material," Paragraph 35.70, "Surveys for Contamination and Ambient Radiation Exposure Rate."

Specifically designed so you can EASILY and QUICKLY comply with ALL NRC and State Regulatory Requirements for Wipe Test Counting!

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The GENESYS system’s five robotically controlled automated imaging positions, combined with an innovative collimator exchange and locking mechanism, minimize study set-up time and reduce operator errors. The GENESYS bi-level motorized table maximizes patient comfort and safety enabling improved brain SPECT imaging. For a closer look at GENESYS and a color brochure, call ADAC at 1 (800) 538-8531 or within California at (408) 945-2990. Write to: 540 Alder Drive, Milpitas, CA 95035

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SCIENTIFIC PROGRAM
Plenary sessions, with lectures given by invited speakers, will feature the following main topics: Oncology, Emission Tomography, Cardiology, Pediatrics, Neurology. Scientific Papers, Works-in-Progress, Technicians’ Program, Scientific and Commercial Exhibition, and Pre- and Post-Congress Meetings are also included. Topics related to nuclear medicine will be considered for inclusion in the scientific program as follows:

Clinical science applications:
Cardiology and Circulation, Bone/Joint Diseases, Pulmonary Diseases, Neurology, Nephrology, Hematology, Endocrinology, Pediatrics, Gastroenterology, Oncology, Immunology, Infectious Diseases

Physical science—basic research:
Computers and Data Analysis, NMR: Imaging and In Vivo Spectroscopy, Dosimetry, Radiobiology, Instrumentation

Laboratory science and in vitro applications:
Radioassay, Tumor Markers, Cell Labeling, Genetic Engineering

Radiopharmaceutical:
General, Halogens, Positrons, Proteins/Antibodies, Technetium

Call for Abstracts:
The deadline for the receipt of abstracts is:
March 15, 1989

MALLINCKRODT FELLOWSHIP AWARD

Mallinckrodt, Inc. has announced an Annual Fellowship of $30,000 for a physician fellow active in nuclear medicine research and/or development.

The award is to further a research and/or development project and applicants are asked to submit their curriculum vitae, a detailed account of their research project including prior accomplishments on the project, and future plans. This information, along with at least two letters supporting the application, should be forwarded to:

William J. MacIntyre, PhD
The Society of Nuclear Medicine
136 Madison Avenue
New York, NY 10016-6760

The recipient will be announced at the Annual Meeting of the Society of Nuclear Medicine in St. Louis, Missouri.

Deadline for this year’s award is January 31, 1989.
We're looking for Nuclear Medicine Technologists—certified, highly qualified and excited about the vision that characterizes Nuclear Medicine. In return, we offer a special kind of challenge: to work with the team that is the leading force in Nuclear Medicine today. The team at the Clinical Center of NIH.

The Clinical Center is a 540-bed hospital near Washington, D.C. It's part of the National Institutes of Health, established by Congress. We serve patients from all over the world, and our laboratories perform Nobel prize-winning research. It's the only hospital of its kind. Here, you can participate in the kind of ground-breaking work that drew you into this field in the first place. And you can gain professional experience that's unmatched anywhere else in the world.

You may choose to focus on clinical nuclear medicine, positron emission tomography, or monoclonal antibody imaging. Using three SPECT cameras, three PET systems, two whole-body scanners and four gamma cameras backed by a state-of-the-art computer system, you'll provide diagnostic information for physicians from the thirteen institutes of the NIH. You'll use traditional imaging agents and also help test experimental radiolabeled monoclonal antibodies for clinical efficacy. Employing very short-lived radioactive isotopes (C11, N13, O15 and F18) produced in NIH's two medical cyclotrons, you'll use state-of-the-art PET scanners to pioneer new methods of diagnosing a variety of neurological diseases, cardiac abnormalities and somatic cancers.

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TRIAD SPECT SYSTEM
A REVOLUTION IN NUCLEAR MEDICINE

THE TRIAD SPECT SYSTEM

The three camera TRIAD gives you unprecedented speed and flexibility when performing SPECT studies.

With up to five times the sensitivity of most one camera SPECT systems, the TRIAD can increase throughput by up to 300%. Also, with sub-second slice reconstruction, the TRIAD sets a processing standard by which other systems will be measured.

TRIAD opens new vistas in study flexibility by letting you balance throughput and count collection in several ways. You can increase throughput by up to 300% using your current SPECT imaging requirements. Or, you can improve resolution in two ways: collecting more counts per study or by being more selective in count acceptance with Ultra High Resolution or Super Fine Resolution collimators. Then again, you can strike a middle ground — increase throughput and improve image resolution. The choice is yours.

Once the data is collected and images are reconstructed, the TRIAD again sets the standard with a new generation of processing tools. These tools, coupled with powerful review application packages, allow fast image processing and manipulation.

And all this can be done so easily. The TRIAD uses a “pop up” menu and window system, so study and processing tasks can be performed using only a standard keyboard and three-key mouse.

But to really see the TRIAD, let’s take a closer look.

GANTRY DESIGN

Major engineering emphasis was placed on the gantry design. For increased system safety and improved mechanical stability, the cameras are mounted on a solid aluminum plate, which is attached to a heavy steel gantry frame. This plate rotates 360°, allowing data collection by all cameras at each selected angle around the imaged organ. The cameras also move radially in and out to make either a large or small throughput hole, depending on the patient’s size and the type of study. This, plus the ability to select a circular or a non-circular orbit and either a step-and-shoot or a continuous rotation, provides the optimal rotation range and camera-to-patient proximity for a variety of studies. The TRIAD’s three cameras and continuous rotation make it possible to collect a 360° projection set in five seconds — ideal for dynamic studies.
CLOSE IMAGING FOR IMPROVED RESOLUTION

For torso imaging, the cameras are equipped with parallel hole collimators. During rotation, each camera moves along its radius, following a non-circular orbit tailored to the patient's body. The proximity of the camera to the patient means better image resolution.

For brain imaging, the cameras are fitted with fan beam collimators. The cameras tightly surround the patient's head for 360° count collection at each selected angle. Combining fanbeam collimators with a tight camera triangle increases sensitivity and improves image resolution.

The TRIAD's unique design makes it a natural choice for sequential dynamic imaging of cerebral blood flow, especially when the isotope distribution changes over time.

HEAD HOLDER AND CAMERA EDGE TO UFOV

The neck contoured head holder aligns the patient's brain axis with the cameras for improved SPECT imaging and patient comfort.

A shorter distance from the camera edge to the UFOV means imaging of the entire head without shoulder interference.

GANTRY & PATIENT TABLE CONTROLS

Gantry Control Panels and a walk around Hand Controller allow easy camera and patient table set up. For ease of use, Gantry Control Panels are on both sides of the TRIAD gantry.

The Gantry Display allows review of camera positioning and other study information at a glance.

IMAGE PROCESSING

The most advanced SPECT system deserves the best in image processing.

TRIAD harnesses the power of Unix™ in a 32 bit CPU and programmable, 32 bit floating point array processors for subsecond slice reconstruction.

After reconstruction is where TRIAD really shines. For detailed image interrogation, a complete processing package is offered; Cine, Zoom, ROI analysis, Dual Tomo Display, matrix utilities and more may be called from "pop up" menus. The processed images are then viewed in custom, "pop up" windows.

The TRIAD not only provides images quickly for sophisticated interrogation, but it does it easily. All acquisition and image processing functions may be performed from a single workstation. Further, software design using "pop up" menus and "pop up" windows allow these tasks to be done and results reviewed with a single, large screen monitor, a standard keyboard and a three-key mouse. In addition the TRIAD supports almost all networking standards.

And all this power, flexibility and ease has been engineered into a single electronics rack, thus saving space and reducing noise and heat.
Trionix was founded in 1986 by the core of Technicare’s Nuclear Engineering Department.

The team’s first goal was to bring their latest and most ambitious Technicare project — The Triad — to market. Trionix accomplished this in 1988.

Today’s goal is to remain on the cutting edge of product development for the medical imaging industry.

We believe that this goal can only be reached by keeping your needs uppermost in our minds and by faithfully adhering to our three-point corporate philosophy:

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- always with a concern for humanity.
For the newest ideas in nuclear medicine, look to the oldest national nuclear pharmacy.

Syncor puts your needs first. As specialty pharmacies, our goal is to provide service and support, not to sell our own products. We don't manufacture any.

We can supply radiopharmaceuticals from most manufacturers, so you receive what you want when you need it—in emergencies, on weekends, during the night.

Syncor service gives you just-in-time inventory control, so you can stop placing radiopharmaceutical orders 24 hours in advance...or ordering extra to cover emergencies...or maintaining a hot lab...or worrying about waste disposal.

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Our new digital gamma cameras—the GCA-901A for whole-body scanning and the GCA-602A for cardiac applications—let you perform up to five critical functions simultaneously.

With a few simple keystrokes, images are acquired with a digitally integrated detector. Data can be acquired from an analog gamma camera, processed and made ready for analysis, then stored on optical laser or floppy disk. And data can be transferred between Toshiba digital gamma camera systems. Simultaneously.

The system is swift to react, saving one of the nuclear imaging department's most priceless commodities. Time.

In fact, operator processing can be completed by the time you count to one. So patients can leave the scan room sooner. And you can get a lot more done in a day.

If saving time is important to you, consider the GCA-901A and GCA-602A digital gamma cameras from Toshiba. They're making throughput part of the total imaging picture, and we'll go "head to head" with any of our competitors to prove it.

Toshiba. Where time is of the essence.

HEAD TO HEAD

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In Touch with Tomorrow

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We Apply Ourselves to Applications... So You Don’t Have To.

It doesn’t matter how sophisticated the imaging hardware may seem to be. Without the software, you are simply not in business.

And that is what differentiates the Three-Head PRISM™ Model 3000-S SPECT System from its competition.

Right now, PRISM is fully capable of real-time gated cardiac acquisition. PRISM supports up to four simultaneous activities with its multi-tasking software. Examples of useful functions include regions of interest, histogram plotting and patient annotation.

PRISM’s operational ease is enhanced by its menu-driven user interface with instant on-line help available anytime at the touch of a key. Once patient data is collected, the interactive reconstruction package speeds slice localization, filter selection and transverse reconstruction. Sagittal, coronal and oblique reconstructions are completed quickly and accurately, too.

We are not suggesting that only PRISM’s software is sophisticated. PRISM uses a dedicated hardware back-projector with dual pipeline architecture that reconstructs a 128 x 128 image in just 500 milliseconds. The 32-bit Array Processor has a dedicated reconstruction bus that directly accesses an 8 Mbyte mass memory organized as 2,097,152 words, with 32 bits/word. And there is also a separate dedicated 8 Mbyte acquisition memory. And plenty of image storage. And much more.

PRISM is also a lot of little things included to improve clinical utility. Such as a low attenuation patient table, large field of view detectors with minimal edge interference for improved brain imaging, precise laser positioning mechanism and a host of comforting safety features.

The hardware that you need and the software that you want are uniquely integrated in PRISM. And it’s all available now.

The result? Superb image quality. The fact is, a PRISM brain image was selected as Image of the Year at the annual meeting of The Society of Nuclear Medicine.

If you would like to be part of this new season in nuclear medicine, just call Stephen J. Maloney, Director of Sales at (216) 475-1111.
The Cardiac Stress Table is designed for fast set up and easy operation. It allows the widest possible accommodation to desired exercise position, patient physique, preferred exercise/imaging procedure, and camera geometry.

The ergometer “floats” in the X-Y plane so it can be adjusted to any patient leg length. The back rest adjusts to permit stress testing from supine to the sitting position, or at any degree in between. The combination of angulated back and moveable ergometer creates the most comfortable patient position, affording unobstructed, clear approach for portable or wide-field cameras. Available with your choice of ergometers—Tunturi or Collins.

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Both the Starcam 3000 and 2000 systems feature GE's preferred counter-balanced ring gantry for simplified patient positioning and maximum throughput.

The theory of natural selection

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All AccuSync-5L features with the exception of the Strip Chart Recorder.

All AccuSync-5L features with the exception of Digital CRT Monitor.

All AccuSync-IL features with the exception of the Strip Chart Recorder and Playback Mode.

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using aerosols to determine the patency of the pulmonary airway system? Use a gas (that’s what the airway system is for), and Xenon (127 or 133) are gases which are safe, economical and easy to administer with the XENAMATIC™ 3000.

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The only publication that combines all the previously MIRD absorbed dose estimates in one volume, the **MIRD Primer** provides a fresh explanation of the MIRD schema, along with examples to illustrate applications. The **Primer** contains revised and updated MIRD dose estimate reports and a detailed explanation of the MIRD method. The **MIRD Primer** also contains a substantive index, a detailed glossary and list of symbols. 1988. 128 pp. Hardcover. $35 for members; $50 for non-members.

- **SPECT: A Primer**, by Robert J. English, CNMT, and Susan E. Brown, CNMT.
Now in its fourth printing, the **Primer** accorded the technologists’ fundamentals of the field SPECT, as both an introductory and extension of any radioimager’s operating manual. It is regarded by many as one of the **two** handbooks on **SPECT**. 1986. 148 pp. Paper. $15 members; $17 non-members.

- **Fundamentals of Nuclear Medicine, 2nd Edition**, edited by Naomi P. Alzarki, MD, and Fred S. Mishkin, MD.
Designed as a basic text to acquaint practitioners and students with the possibilities and limitations of nuclear medicine in detecting and evaluating common disorders, this completely revised and updated edition is essential to all those who want an understanding of this rapidly evolving technology. 1988. 256 pp. Paper $15; accredited instructors may purchase a minimum of 10 copies at $4 each.

- **The Scintillation Camera**, edited by Guy Simmons, PhD.
Targeted to advanced technologists, physicians, and other scientists, this book provides, in a single volume, easily accessible state-of-the-art information on all aspects of the scintillation camera, from instrument selection and performance evaluation to operation monitoring in the clinical environment. **The Scintillation Camera** should be especially helpful to those teaching the principles of scintillation cameras. 1988. 160 pp. Paper. $30 members; $35 non-members.

**Order Form**

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Call for Abstracts for Works-in-Progress

The 1989 Scientific Program Committee solicits the submission of abstracts from members and nonmembers of The Society of Nuclear Medicine for the 36th Annual Meeting in St. Louis. Works-in-Progress accepted for the program will be published in a separate on-site show directory that will be distributed to all those who attend the meeting. Original contributions on a variety of topics related to nuclear medicine will be considered, including:

- INSTRUMENTATION
- COMPUTERS AND DATA ANALYSIS
- RADIOASSAY
- RADIOPHARMACEUTICAL CHEMISTRY
- DOSIMETRY/RADIOBIOLOGY
- NUCLEAR MAGNETIC RESONANCE
- CLINICAL SCIENCE APPLICATIONS
  - Bone/Joint
  - Cardiovascular
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Authors seeking publication for the full text of their papers are strongly encouraged to submit their work to the JNM for immediate review.

A complete educational program for technologists will be offered and technologists are encouraged to submit abstracts of their work for consideration.

The official abstract form for Works-in-Progress may be obtained from the September 1988 issue of the JNM or by calling or writing:

The Society of Nuclear Medicine
Att: Abstracts
136 Madison Avenue, New York, NY 10016-6760
Tel: (212)889-0717
FAX: (212)545-0221

Deadline for Works-in-Progress is Thursday, April 7, 1989

Call for Abstracts for Scientific Papers

Call for Abstracts for Scientific Exhibits

The 1989 Scientific Program Committee and Scientific Exhibits Subcommittee solicits the submission of abstracts from members and nonmembers of The Society of Nuclear Medicine for the 36th Annual Meeting in St. Louis. Abstracts accepted for the program will be published in a special supplement to the May issue of The Journal of Nuclear Medicine. Original contributions on a variety of topics related to nuclear medicine will be considered, including:

- INSTRUMENTATION
- COMPUTERS AND DATA ANALYSIS
- RADIOASSAY
- RADIOPHARMACEUTICAL CHEMISTRY
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Positions Available

Fellowship
PET RESEARCH FELLOWSHIP. The Imaging Research Laboratory, Dept. of Radiology at the University of Washington, Seattle, is offering a research fellowship in positron tomography. The position is funded as part of a National Cancer Institute Program Project entitled "Technologic Imaging of Cancer and Its Response to Therapy." We seek an individual with a strong scientific background to participate in this NIH RO1 fellowship who will have an opportunity to participate in and conduct studies of blood flow, oxygen uptake, permeability, thyroid metabolism, and hypoxia imaging with fluoro derivatives. Please send resume to: Michael M. Graham, PhD, MD, Div. of Nuclear Medicine, 1201 University Way, WA 98105. The University of Washington is an Equal Opportunity Employer.

FELLOWSHIP IN NUCLEAR MEDICINE. University of Mississippi—Columbia. One or two yr medical and research fellowship in nuclear medicine starting July 1, 1989. The fellowship is integrated between University and adjacent Harry S. Truman Memorial Veterans Hospitals. Research opportunities include basic science and clinical work with new single photon emission computed tomography, emission flow agents, and a range of therapeutic radiopharmaceuticals. Facilities include basic science laboratories, full SPECT imaging systems at both hospitals, and opportunities for CT, ultrasound, and MR imaging correlations. Clinical program has strong cardiovascular nuclear medicine emphasis. Candidates must be board certified or eligible. Send letter of interest, including list of references, to: Richard A. Holmes, MD, Chief of Nuclear Medicine, University of Mississippi Medical Center, Jackson, MS 39216. University is an equal opportunity/affirmative action employer.

Physician
CHIEF, NUCLEAR MEDICINE. Position is for part-time staff physician. Criteria include fellowship-trained, board certified in nuclear medicine. The VA Medical Center is affiliated with Jefferson Medical College and has residency programs in surgery, internal medicine, neurology, ophthalmology, otolaryngology, urology, and oral and maxillofacial surgery. The department consists of three full-time nuclear medicine physicians, radiological imaging and radioimmunoe assay studies are performed. Licensure in any State is sufficient. Excellent geographic location with seven major teaching hospitals, Washington DC, Atlantic City Shore, ski resorts, and Chesapeake Bay. Excellent community living. English language proficiency required. Contact: William G. Jones, MD, Chief of Staff at the VA Medical Center, Wilming tong, Delaware 19895. (302) 994-2511, ext. 203.

NUCLEAR MEDICINE PHYSICIAN. Board certified, or board eligible. Practice opportunity in Ohio in a 600-bed community hospital with university affiliation (and opportunity for faculty appointment) to join two physicians. The department has six gamma cameras including SPECT with appropriate computer support, joint directorship over MRI (1.5 T. soon to be 3T), optical tomography, 24 TE and 24 TE thermography and PET with cyclotron within 1 yr. The candidate should be prepared for a busy clinical practice, with an interest in research and a strong desire to do clinical research. Send CV to: Box R1, The Society of Nuclear Medicine, 156 Madison Ave., 8th Floor, New York, NY 10016-6760. EOE.

NUCLEAR MEDICINE PHYSICIAN. Full-time appointment at the VA Medical Center in Portland, OR. Must be ABNM eligible/certified. Opportunity for candidate to enjoy a busy clinical and research academic university setting. Teaching programs include nuclear medicine residency and technologist training. All new equipment including PET, CT, SPECT, and a PET computer network. Clinical workload includes both imaging and RIA. Research interests in hepatobiliary, brain or monoclonal antibodies are encouraged. Position includes an academic appointment at affiliated medical schools (OHSU and Lewis & Clark). The VAMC is an Equal Opportunity and Affirmative Action Employer. For further information contact: G.T. Krishnamurthy, MD, Nuclear Medicine Service (ISP), Box 1034, Portland, OR 97207. (503) 275-5023.

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HEALTH/RADIOLOGICAL PHYSICIST. Excellent opportunity for radiologist with a bachelor's degree in scientific discipline and 2-3 years of technical experience. Join a rapidly growing hospital/company providing service to the medical and biomedical community. Call or send resume to: Cathy Husey, Health Physics Services, Inc., 480 Neck Road, Rockville, MD 20850. (800) 638-8488 or in Maryland (301) 670-848. An Equal Opportunity Employer.

Radiologist
STAFF RADIOLoGISTS. The College of Physicians and Surgeons of Columbia University is searching for Junior and Senior staff radiologists in our nuclear medicine division. Salary and rank will be commensurate with experience and qualifications. Responsibilities include patient care, teaching, and supervising residents for Junior staff level; research as well as demonstrated academic ability in addition for Senior Staff level. Requirements include one to two yr of specialized training in nuclear medicine and board eligibility or certification in American Board of Radiology with special competence in Nuclear Radiology and/or American Board of Nuclear Medicine. NY State medical license required. NYS medical license desirable. Please send resume to: Philip O. Alderson, MD, Dept of Radiology, 622 W. 168th St., New York, NY 10032. Columbia University is an Affirmative Action/Equal Opportunity Employer.

RADIOLOGIST. 10 man private group seeks BC/BE diagnostic radiologist with special competence or board certification in nuclear medicine. Practice covers 2 hospitals and office with output of a total of 120,000 exams/year. Beautiful midwestern university town. Excellent community and early partnership arrangement. Send CV or call: Joe McCollum, MD, 909 E. University Street, Bloomington, IN 47401; 812-336-9446.

Residency
Two and four yr Nuclear Medicine RESIDENCIES are available at St. Luke's Medical Center, Milwaukee, WI. St. Luke's is a 600-bed tertiary care community hospital and is the sixth largest in the Midwest. As such, the program is particularly strong in nuclear cardiology and SPECT. Current instrumentation includes eight gamma cameras, six of which are SPECT cameras. Staff includes two nuclear medicine physicians, a pharmacist, and a programmer. Residents are required to write one paper per year. Address applications and inquiries to: Dr. David Vuille, Director of Nuclear Medicine Residency, St. Luke's Medical Center, 2900 W. Oklahoma Ave., Milwaukee, WI 53215. EOE.

NUCLEAR MEDICINE RESIDENCY. July 1989. Comprehensive imaging/RAD/therapy program in three hospitals (private, county, VA) with 296 total beds. Mobile imaging for 216 ICU beds. Large pediatric population. Strong cardiovascular emphasis. Fellowship and P.A. NMR, PET with optional rotation in CT/ultrasound. Contact: Warren H. Moore, MD, Dept. of Radiology, Baylor College of Medicine, One Baylor Plaza, The Department of Nuclear Medicine, Baylor College of Medicine is an equal opportunity/affirmative action employer.

Technologist
HAWAII! NUCLEAR MEDICINE TECHNOLOGISTS: The Queen's Medical Center, a 508-bed acute care teaching facility located in downtown Honolulu has immediate full-time positions available for nuclear medicine technologists. Experience in SPECT and/or PET is required. Equal opportunity employer. Our new, modern, state-of-the-art equipment includes multiple SPECT cameras/computer systems. Enjoy all your outdoor activities year-round with our warm tropical climate. Interested applicants may call collect, Jerrie Balai, Employment Specialist, (808) 547-4355, or send resume to: The Queen's Hospital Personnel Services, 1301 Punchbowl St., Honolulu, HI 96813. EOE.

NUCLEAR MEDICINE TECHNOLOGIST. The University of Utah is accepting applications for a registered or registry-eligible Nuclear Medicine Technologist. Our division provides a full range of imaging, cardiac, and research procedures with multiple cameras, SPECT, and computers. Competitive salary and benefits. Salt Lake City is a pleasant city located near mountains, ski resorts, and excellent cultural and recreational areas. Contact: Paul E. Christian, Nuclear Medicine, University of Utah Medical Center, Salt Lake City, UT 84132. (801) 581-2716. EOE.

NUCLEAR MEDICINE TECHNOLOGIST. St. John's Regional Health Center, an 85-bed acute care hospital, has a full-time staff opening. The applicant must be registered or registry-eligible. A bachelor's degree in medical technology is preferred. Experience in SPECT data processing, and cardiovascular nuclear medicine is preferred. On-call rotation is required. We offer a salary range of $23,300-30,200, an excellent benefit package, and a sign-on bonus of $1,500. Send resume to, or call collect: Jerri Fikkerma, (417) 885-2946. Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST. To work in a suburban hospital located in the northern part of Indiana. Requires three years experience in nuclear medicine and a minimum of 6 months experience with a gamma camera. Send resume to: Jeff Rellis, Supervisor, Nuclear Medicine, M/C 931, 1740 Taylor St., Chicago, IL 60602. (312) 996-3965.

NUCLEAR MEDICINE TECHNOLOGIST/SUPERVISOR. Challenging opportunity for technologist to join a growing, well respected nuclear medicine department operating in two 128-bed acute care hospitals located 40 mi north of Chicago. The hospital is ValleyWest/Valleymobile, the Valley West Campus. SPECT will soon be added to expand cardiology and ECT studies. Qualified candidate must be registered (ARRT).
NUCLEAR MEDICINE TECHNICIAN AND TECHNOLOGIST. Opportunity for challenging position in state-of-the-art department affiliated with Marshall University School of Medicine. Education and/or experience required. Certification required within 1 yr. Excellent fringe benefits. Tuition support may be available. Salary competitive. Call: Personnel Service, VA Medical Center, Huntington, WV. (304) 429-6741, ext. 2335. EOE.

NUCLEAR MEDICINE TECHNOLOGIST. Immediate opening for registered technologist with experience in radiology, SPECT imaging, Elscint instrumentation, and processing preferred. Salary commensurate with experience and education. Send CV to: Dr. James B. Kline, PO Box 1468, Terre Haute, IN 47808. EOE.

NUCLEAR MEDICINE TECHNOLOGIST. The University of Kansas Medical Center, a 500-bed, tertiary-care teaching hospital, is seeking a full-time staff technologist for their progressive imaging section. The position requires certification by the ARRT(N) or NMTCB. The Division of Nuclear Medicine offers a full range of imaging/research procedures, a Nuclear Pharmacy, MDS, GE and Sodipy computer systems and five imaging systems (1 SPECT and 1 portable camera) with plans for an additional SPECT system. We offer a 4-day work week with 10-hr days, excellent benefits and salary commensurate with experience. Send resume or contact: Mel Allen, MBA, Supervisor, Div. of Nuclear Medicine, University of Kansas Medical Center, Kansas City, KS 66103. (913) 588-6843. An EO/EAA Employer.

NUCLEAR MEDICINE TECHNOLOGIST. Full-time position available in a 395-bed acute care facility for a registered or registry-eligible nuclear medicine technologist to work in state-of-the-art Radiology Department which includes SPECT camera and LFP camera. St. Mary's Hospital is located in Decatur, IL (pop. 95,000) midway between St. Louis and Chicago. Competitive salary and flexible benefit program which includes health, life, dental and long-term disability. Please contact: Personnel Dept., St. Mary's Hospital, 1800 E. Lake Shore Dr., Decatur, IL 62521. (217) 429-2966. EOE M/F. An affiliate of Hospital Sisters Health System.


NUCLEAR MED TECH AND MRI TECHS. Ski in beautiful western Colorado and pursue your career in progressive Radiology Dept. in 252 bed Level II Trauma Center. Renowned ski resorts-Vail, Aspen, Telluride-within close proximity. Smaller area within one hour drive. Competitive salaries. Benefits include: vision, dental, life, four weeks Paid Time Off Plan, Tuition Reimbursement. Send resume to Human Resources Department, St. Mary's Hospital, Box 1628, Grand Junction, CO 81501. Ph: 303-244-2540.

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For further information and applications for July 1, 1989, contact:
Joseph A. Prezio, M.D., F.A.C.P.
Clinical Professor and Chairman
SUNY/Buffalo Nuclear Medicine
20 Diefendorf Annex
3435 Main Street
Buffalo, NY 14214

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We are currently seeking Nuclear Medicine Technologists to work with our nursing and medical staff, ensuring the accurate administration of therapeutic and diagnostic procedures and attendant quality control.

These positions require at least one year of extensive clinical training and a degree from an accredited school of nuclear medicine technology. Current registration with the ARRT or certification by the Nuclear Medical Technology Board is required.

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For consideration call us TOLL FREE 1-800-327-6402 outside Florida or, from within Florida, call us COLLECT at (407) 841-5186, or send your resume to Orlando Regional Medical Center, Personnel Dept. JNM, 1414 S. Kuhl Ave., Orlando, FL 32806. An Equal Opportunity Employer.

Nuclear Medicine Technologist

Join The Children's Hospital of Boston, the nation's leading pediatric institution. You will work with a close-knit group of high caliber professionals in our expanding Nuclear Medicine division. Using state-of-the-art gamma cameras (two ECT's) in a computerized network integrated environment, you will perform the full range of nuclear imaging procedures. Our division is actively involved in clinical, research and teaching activities. To qualify, you must be registered or registry eligible as a Nuclear Medicine Technologist. We will consider recent graduates as well as professionals with 3 to 4 years of nuclear medicine experience.

The Children's Hospital offers an excellent salary and benefits package, including relocation assistance and temporary housing. Please send your resume, in confidence, to: R.T. Davis, CNMT, Technical Director, Division of Nuclear Medicine, or call (617) 735-7010.

The Children's Hospital
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BOSTON
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University of Toronto

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- **CLINICAL CO-ORDINATOR**-MD essential, nuclear medicine physician with experience in a PET facility.
- **RADIOCHEMIST**-PhD with experience in the synthesis and development of C-11 and F-18 radioligands including neurotransmitters and neuroleptics.
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All the above are research and teaching positions with a University Appointment at the appropriate rank. Address replies, with references, to: Dr. Vivian M. Rakoff, Director and Psychiatrist-in-Chief, Clarke Institute of Psychiatry, 250 College St., Toronto, Ontario, M5T 1R8, Canada

All applications will be considered. However, in accordance with Canadian immigration requirements, this advertisement is at first directed to Canadian citizens and permanent residents.

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For confidential consideration, send CV and bibliography to: DA Rottenberg, MD, Medical Director, VAMC/UMHC PET Program,

c/o Robert A. Petzel, MD
Chief of Staff
Veterans Administration Medical Center
One Veterans Drive
Minneapolis, MN 55417

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Royal College certification or equivalent in both nuclear medicine and diagnostic radiology. For Director of Division of Nuclear Medicine. Preference given to person with special training in nuclear cardiology. Post carries teaching and research responsibilities at Queen's University. Income based on fee-for-service. In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. Candidates of both sexes are equally encouraged to apply. Applications with CV and references should be forwarded to: Dr. T.W. Challis, Professor and Head, Dept. of Diagnostic Radiology, Queen's University, Kingston, Ontario K7L 3N6, Canada. EOE.

NUCLEAR MEDICINE TECHNOLOGIST

Mid-Columbia Medical Center is currently seeking a registered or registry eligible Nuclear Medicine Technologist. The individual would be self motivated to help us in developing our department. We are purchasing an entirely new system including SPECT to offer a full range of imaging capabilities. This position is Mon-Fri. with some call.

We are a 125-bed JCAH hospital located on the beautiful Columbia River, known as the windsurfing capital of the world. Salary commensurate with experience. Excellent benefits including a 401-K plan, and an on campus Child Care Center. Moving expense allowance available.

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RADIOPHARMACIST/RADIOCHEMIST

The Division of Nuclear Medicine, Department of Radiology, George Washington University, has a full-time position available for a RADIOPHARMACIST/RADIOCHEMIST. Responsibilities include supervising and operating a clinical in-house radiopharmacy with formulating, compounding, dispensing, and quality assurance functions; teaching of fellow, residents, and technologists; and collaborative and independent research. Our facilities include state-of-the-art equipment, clinical laboratory space, and research laboratory space and equipment. Requirements include formal education in radiochemistry, radiopharmacy, or in a similar field, and experience in clinical radiopharmacy. Apply to: Dr. Richard C. Reba, Director, Division of Nuclear Medicine, George Washington University, 901-23rd Street, N.W., Washington, D.C. 20037, (202)994-3786.
THE SOCIETY OF NUCLEAR MEDICINE

Annual Winter Meeting

Title: SPECT: How To Get Started; How To Do It Well—A Special Two-Day Symposium
Date: Monday–Tuesday, Feb. 13–14, 1989
Location: Le Meridien Hotel, New Orleans, LA
Program: Includes a national panel of distinguished speakers presenting topics on SPECT

Sponsors: The Computer & Instrumentation Council of The Society of Nuclear Medicine

Fee: SNM Member, $175; Nonmember, $205
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CME Credit: 13 hrs AMA Category 1
VOICE Credit for Technologists: 1.3 hrs VOICE Credit for Technologists

Travel Info: ITS/I-800-621-1084

For further information contact:
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Elscint, a leader in medical diagnostic imaging systems, introduces the Apex SP-1, a powerful new processor designed to meet the rapidly expanding productivity and imaging requirements of nuclear medicine. Based on state-of-the-art 386/387 microcomputer technology and 32-bit computer power, the SP-1 has 9 megabyte RAM memory and a 0.8 gigabyte optical disk cartridge to provide the highest level of processing, with optimal information storage and flow. The following processing times give an idea of the power and speed of the new Apex SP-1 Nuclear Medicine Processor: 30 sec- multigated processing; 3 min to 10 sec- first pass procedure, complete with processing and report; less than 4 min- stress/redistribution Thallium-201 SPECT reconstruction and processing, including polar mapping; less than 15 sec- 3D image reconstruction. The Apex SP-1 handles simultaneous acquisition, reconstruction, display, and data analysis and can store thousands of cases. With Elscint's ApexNet™ connectivity, the SP-1 can be connected via fast Ethernet communication link to other Apex systems or to other PCs of mainframe computers and, via modem to other Apex users, anywhere. Elscint, Inc., 930 Commonwealth Ave., Boston, MA 02215 Attn. Tim Wilbur. (617) 739-6000 Ext. 31.

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Circle Reader Service No. 102

"Innovative Serum Tumor Markers in Cancer" is the subject of a new cancer management educational series published by the Meniscus Educational Institute, under the auspices of the Office for Continuing Education, Temple University School of Medicine, through the aid of a grant by the Amersham Corporation. The program reviews ovarian, pancreatic, and breast cancers, and describes the various treatment modalities currently available. Results of studies using CA-125 (ovarian), CA 19-9 (pancreatic), and 15-3 (breast) diagnostic kits are compared with other types of markers. Case studies discuss recommendations for the appropriate indications for and timing of serum tumor markers. The program consists of monographs, lecture slides, and audiotapes, which is contained in a convenient presentation folder. The program is available free of charge to physicians, hospitals, universities, and other qualified institutions. Meniscus Limited, Meniscus Educational Institute, 1623 Spruce St., Philadelphia, PA 19103-6306. (215) 735-8450.

Circle Reader Service No. 104

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

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**MPI MAA Kit**

* May be used in adults and children as an adjunct in the evaluation of pulmonary perfusion.
* Lyophilized product offers excellent stability.
* No refrigeration required during shipping.
* Up to 100 mCi per reaction vial.
* Color-coded packaging and labeling for easy identification.
* Color-coded flip-top seal for convenient one-handed opening.

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**DESCRIPTION:** The kit consists of 10 waste reaction vials which contain the sterile, non-pyrogenic, non-radioactive ingredients necessary to produce Technetium Tc 99m Albumin Aggregated Injection for diagnostic use by intravenous injection.

Each 10 ml reaction vial contains 2.5 mg of Albumin Aggregated, 5.0 mg of Albumin Human, 0.08 mg (minimum) stannous chloride (maximum stannous and stannic chloride 11 mg) and 1 mg of sodium chloride. The contents are in a lyophilized form under an atmosphere of nitrogen. Sodium hydroxide or hydrochloric acid has been used for pH adjustment. No bacteriostatic preservative is present.

The Albumin Human was non-reactive when tested for hepatitis B surface antigen (HBsAg) by radioimmunoassay. The aggregated particles are formed by denaturation of Albumin Human in a heating and aggregation process. Each vial contains 4 x 6 million particles. By light microscopy, more than 99% of the particles are between 10 and 70 micrometers, while the typical average size is 20 to 40 micrometers, none is greater than 150 micrometers.

Technetium Tc 99m Albumin Aggregated Injection for intravenous use is in its final dosage form when sterile isotonic sodium pertechnetate solution is added to each vial. No less than 90% of the pertechnetate Tc 99m added to a reaction vial is bound to aggregate at preparation time and remains bound throughout the 6 hour lifetime of the preparation.

**INDICATIONS AND USAGE:** Technetium Tc 99m Albumin Aggregated Injection is a long lasting agent which may be used as an adjunct in the evaluation of pulmonary perfusion in adults and children.

**CONTRAINDICATIONS:** Technetium Tc 99m Albumin Aggregated Injection should not be administered to patients with severe pulmonary hypertension.

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

**WARNINGS:** Although adverse reactions specifically attributable to Technetium Tc 99m Albumin Aggregated have not been noted, the literature contains reports of deaths occurring after the administration of Albumin Aggregated to patients with pre-existing severe pulmonary hypertension. Therefore, the use of Technetium Tc 99m Albumin Aggregated should be attempted only in patients whose symptoms are mild enough to permit monitoring of adverse events.

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

In patients with right to left heart shunts, additional risk may exist due to the radioactivity of Albumin Aggregated in the systemic circulation. Therefore, safety of this agent in such patients has not been established.

Hypersensitivity reactions are possible whenever protein-containing materials such as pertechnetate labeled Albumin Aggregated are used in man. Epinephrine, antihistamines, and corticosteroids should be available for immediate use.

The intravenous administration of any particulate materials such as Albumin Aggregated may result in a temporary small mechanical impediment to blood flow. While this effect is probably physiologically insignificant in most patients, the administration of Albumin Aggregated is possible hazardous in acute or chronic pulmonary and other states of severely impaired pulmonary blood flow.

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

Contents of the vials are intended only for use in the preparation of Technetium Tc 99m Albumin Aggregated Injection and are NOT to be administered directly to the patient.

The Technetium Tc 99m labeling reactions involved depend on maintaining the stannous ion in the reduced state. Hence, sodium pertechnetate Tc 99m containing oxidants should not be employed.

The preparation contains no bacteriostatic preservative. Technetium Tc 99m Albumin Aggregated Injection should be stored at 2-8°C and discarded 6 hours after reconstitution.

It is mandatory to test Technetium Tc 99m Albumin Aggregated Injection for photodecomposition, the test must be performed under the same light conditions that may exist during delivery and use of the injection. The test must be performed at least 1 hour after the activating reaction and at least 1 hour after the addition of sodium pertechnetate Tc 99m. If the test shows photodecomposition, the injection batch must be discarded.

**ADVERSE REACTIONS:** The literature contains reports of deaths occurring after the administration of Albumin Aggregated to patients with pre-existing severe pulmonary hypertension. Instances of hemodynamic or idiosyncratic reactions to preparations of Technetium Tc 99m Albumin Aggregated have been reported (see Warnings).

**HOW SUPPLIED:** This kit is intended for the preparation of Technetium Tc 99m Albumin Aggregated Injection Product No. 4432.

Each kit contains 10 reaction vials. Each vial contains in lyophilized form, sterile and non-pyrogenic:

- **Albumin Aggregated**: 2.5 mg
- **Albumin Human**: 5.0 mg
- **Stannous Chloride (minimum)**: 0.06 mg
- **Stannic Chloride**: 0.1 mg
- **Sodium Chloride**: 1.2 mg

The vials must be stored under an atmosphere of nitrogen. Twenty labels with radiation warning symbols and a package insert are supplied in each carton.

**Pregnancy Category C:** Animal reproduction and teratogenicity studies have not been conducted with Technetium Tc 99m Albumin Aggregated Injection. It is known whether Technetium Tc 99m Albumin Aggregated Injection can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. There have been no studies in pregnant women. Technetium Tc 99m Albumin Aggregated Injection should be given to a pregnant woman only if clearly needed.

Ideally, examinations using radiopharmaceuticals, especially those effective in nature, of a woman of childbearing age, should be performed during the first two (approximately 10) days following the onset of menstruation.

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

**Pediatric Use:** The lowest possible number of particles should be used in right-to-left shunting, in neonates, and in severe pulmonary disease.

**HOW SUPPLIED:** This kit is intended for the preparation of Technetium Tc 99m Albumin Aggregated Injection Product No. 4432.

Each kit contains 10 reaction vials. Each vial contains in lyophilized form, sterile and non-pyrogenic:

- **Albumin Aggregated**: 2.5 mg
- **Albumin Human**: 5.0 mg
- **Stannous Chloride (minimum)**: 0.06 mg
- **Stannic Chloride**: 0.1 mg
- **Sodium Chloride**: 1.2 mg

The vials must be stored under an atmosphere of nitrogen.

Ten labels with radiation warning symbols and a package insert are supplied in each carton.

Circle Reader Service No. 30

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