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NUCLEAR REGULATORY COMMISSION
Publication 10CFR35, “Medical Use of By-Product Material,” Paragraph 35.70, “Surveys for Contamination and Ambient Radiation Exposure Rate.”

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Highly accurate in detecting myocardial abnormalities

Cardiolite®
Kit for the preparation of Technetium Tc99m Sestamibi
Clarity that lasts

Please see reverse for brief summary of prescribing information.
Brief Summary

Cardiolite®

Kit for the preparation of Technetium Tc99m Sestamibi

For Diagnostic Use

DESCRIPTION: Each 5 ml vial contains a sterile, non-pyrogenic, lyophilized mixture of:
- Tetrak (2-methoxy isobutyl isonitrile) Copper (II) tetrafluoroborate - 1.0 mg
- Sodium Citrate Dihydrate - 2.5 mg
- L-Cysteine Hydrochloride Monohydrate - 1.0 mg
- Manganese - 20 mg
- Stannous Chloride. Dihydrate, minimum (SnCl2·2H2O) - 0.025 mg
- Stannous Chloride. Dihydrate, (SnCl2·2H2O) - 0.075 mg
- Tin Chloride (Stannous and Stannic) Dihydrate, maximum (as SnCl2·2H2O) - 0.086 mg

Prior to lyophilization the pH is 5.3 to 5.9. The contents of the vial are lyophilized and stored under nitrogen.

This drug is administered by intravenous injection for diagnostic use after reconstitution with sterile, non-pyrogenic, oxidant-free Sodium Pertechnetate Tc99m Injection. The pH of the reconstituted product is 5.5 (5.0-6.0). No bacteriostatic preservative is present.

The precise structure of the technetium complex is Tc99m[MIBI]₄ where MIBI is 2-methoxy isobutyl isonitrile.

INDICATIONS AND USAGE: CARDIOLITE® Kit for the preparation of Technetium Tc99m Sestamibi, is a myocardial perfusion agent that is useful in distinguishing normal from abnormal myocardial activity, and in the localization of the abnormality, in patients with suspected myocardial infarction. It is also useful in the evaluation of myocardial function using the first-pass technique.

CONTRAINDICATIONS: None known.

WARNINGS: In studying patients in whom cardiac disease is known or suspected, take care to assure continuous monitoring and treatment in accordance with safe, accepted clinical procedure.

PRECAUTIONS: GENERAL

The contents of the vial are intended only for use in the preparation of Technetium Tc99m Sestamibi and are not to be administered directly to the patient without first undergoing the preparation procedure (as outlined in the full prescribing information).

Radioactive drugs must be handled with care and appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Also, care should be taken to minimize radiation exposure to the patients consistent with proper patient management.

Contents of the kit before preparation are not radioactive. However, after the Sodium Pertechnetate Tc99m Injection is added, adequate shielding of the final preparation must be maintained.

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.

Technetium Tc99m labeling reactions involved depend on maintaining the stannous ion in the reduced state. Hence, Sodium Pertechnetate Tc99m Injection containing oxidants should not be used.

Technetium Tc99m Sestamibi should not be used more than six hours after preparation.

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

Carcinogenesis, Mutagenesis, Impairment of Fertility

In comparison with most other diagnostic technetium-labeled radio-pharmaceuticals, the radiation dose to the ovaries (1.5 rad/30 mCi) is high. Minimal exposure (ALARA) is necessary in women of childbearing capacity. (See Dosimetry subsection in DOSAGE AND ADMINISTRATION section.)

The active intermediate, Cu(MIBI)BF₄, was evaluated for genotoxic potential in a battery of five tests. No mutagenic activity was observed in the Ames, CHO/K1PRT and sister chromatide exchange tests (all in vitro). At cytotoxic concentrations (20 μg/ml), an increase in cells with chromosome aberrations was observed in the in vitro human lymphocyte assay. Cu(MIBI)BF₄ did not show genotoxic effects in the in vivo mouse micronucleus test at a dose which caused systemic and bone marrow toxicity (9 mg/kg, ≤ 600 × maximal human dose).

Pregnancy Category C

Animal reproduction and teratogenicity studies have not been conducted with Technetium Tc99m Sestamibi. It is also not known whether Technetium Tc99m Sestamibi can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. There have been no studies in pregnant women. Technetium Tc99m Sestamibi should be given to a pregnant woman only if clearly needed.

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

Nursing Mothers

Technetium Tc99m Pertechnetate is excreted in human milk during lactation. It is not known whether Technetium Tc99m Sestamibi is excreted in human milk. Therefore, formula feedings should be substituted for breast feedings.

Pediatric Use

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

ADVERSE REACTIONS: During clinical trials, approximately 8% of patients experienced a transient metallic or bitter taste immediately after the injection of Technetium Tc99m Sestamibi. A few cases of transient headache, flushing and non-itching rash have also been attributed to administration of the agent. One patient demonstrated signs and symptoms consistent with seizure, 8 to 10 minutes after administration of the drug. No other adverse reactions specifically attributable to the use of Technetium Tc99m Sestamibi have been reported.

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

- 370 to 1100 MBq (10 to 30 mCi)

The dose administered should be the lowest required to provide an adequate study consistent with ALARA principles (See also PRECAUTIONS).

When used in the diagnosis of myocardial infarction, imaging should be completed within four hours after administration (see also CLINICAL PHARMACOLOGY section in full prescribing information).

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

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration whenever solution and container permit.

Store at room temperature (15 to 30°C) before and after reconstitution.

RADIATION DOSIMETRY: Table 4 shows the radiation doses to organs and tissues of an average patient (70 kg) per 1100 MBq (30 mCi) of Technetium Tc99m Sestamibi injected intravenously.

Table 4. Radiation Absorbed Doses from Tc99m Sestamibi

<table>
<thead>
<tr>
<th>Organ</th>
<th>2.0 hour void</th>
<th>4.0 hour void</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>rad/Sv/MBq</td>
<td>mGy/Sv/MBq</td>
</tr>
<tr>
<td>Breasts</td>
<td>0.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Gallbladder Wall</td>
<td>2.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Small Intestine</td>
<td>3.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Upper Large Intestine</td>
<td>5.4</td>
<td>55.5</td>
</tr>
<tr>
<td>Lower Large Intestine</td>
<td>3.9</td>
<td>40.0</td>
</tr>
<tr>
<td>Stomach Wall</td>
<td>0.6</td>
<td>6.1</td>
</tr>
<tr>
<td>Heart Wall</td>
<td>0.5</td>
<td>5.1</td>
</tr>
<tr>
<td>Kidneys</td>
<td>2.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Liver</td>
<td>0.6</td>
<td>5.8</td>
</tr>
<tr>
<td>Lungs</td>
<td>0.3</td>
<td>2.8</td>
</tr>
<tr>
<td>Bone Surfaces</td>
<td>0.7</td>
<td>6.8</td>
</tr>
<tr>
<td>Thyroid</td>
<td>0.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Ovaries</td>
<td>1.5</td>
<td>15.5</td>
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<tr>
<td>Testes</td>
<td>0.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Red Marrow</td>
<td>0.5</td>
<td>5.1</td>
</tr>
<tr>
<td>Urinary Bladder</td>
<td>2.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Total Body</td>
<td>0.5</td>
<td>4.8</td>
</tr>
</tbody>
</table>


HOW SUPPLIED: Du Pont's CARDIOLITE® Kit for the preparation of Technetium Tc99m Sestamibi is supplied as a 5 ml vial in kits of two (2), five (5) and thirty (30) vials, sterile and non-pyrogenic.

Prior to lyophilization the pH is between 5.3 and 5.9. The contents of the vials are lyophilized and stored under nitrogen. Store at room temperature (15 to 30°C) before and after reconstitution. Technetium Tc99m Sestamibi contains no preservatives. Included in each two (2) vial kit is one (1) package insert, five (5) vial shield labels and five (5) radiation warming labels. Included in each five (5) vial kit is one (1) package insert, five (5) vial shield labels and five (5) radiation warming labels. Included in each thirty (30) vial kit is one (1) package insert, thirty (30) vial shield labels and thirty (30) radiation warming labels.

The US Nuclear Regulatory Commission has approved this reagent kit for distribution to persons licensed to use byproduct material identified in 35.100 and 35.200 of 10 CFR Part 35, to persons who hold an equivalent license issued by an Agreement State, and, outside the United States, to persons authorized by the appropriate authority.

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All the major manufacturers of nuclear medicine products and services—more than 100 in all—will be on hand to explain and demonstrate the most technologically-advanced equipment. Several companies will present User Meetings to give an in-depth understanding of their products.

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<table>
<thead>
<tr>
<th></th>
<th>On/Before May 8</th>
<th>On/After May 8</th>
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</thead>
<tbody>
<tr>
<td>Physicians/Scientists</td>
<td>$160</td>
<td>$180</td>
</tr>
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<tr>
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</tr>
<tr>
<td>Nonmembers</td>
<td>255</td>
<td>275</td>
</tr>
</tbody>
</table>

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CONTRAINDICATIONS: None known.

WARNINGS: In studying patients in whom myocardial infarction or ischemia is known or suspected, care should be taken to assure continuous clinical monitoring and treatment in accordance with accepted practice. No serious adverse reactions have been reported.

PRECAUTIONS: Data are not available concerning the effect of marked alterations in blood glucose, insulin, or pH (such as is found in diabetes mellitus) on the quality of Thallium Chloride Ti 201 scans. Attention is directed to the fact that thallium is a cardiac isotope, and that the total amount of potassium is affected by these factors, the possibility exists that the thallium may likewise be affected.

GENERAL: Do not use after the expiration time and date (5 days maximum after calibration time) stated on the container. Do not use if contents are turbid.

Thallium Chloride Ti 201 should be measured by a suitable radioactivity calibration system immediately prior to administration.

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

Contraindications, Warnings, Impairment of Fertility: No long-term animal studies have been performed to evaluate carcinogenic potential of any radioactive compound. However, Thallium Chloride Ti 201 affects fertility in males or females.

Identification of thallium-containing pharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first 2 (approximately 10 days) following the onset of menarche.

Pregnancy Category C: Adequate reproductive studies have not been conducted in animals with Thallium Chloride Ti 201. It is also not known whether Thallium Chloride Ti 201 can cause fetal harm when administered to pregnant women, or if it will appear in human milk. Thallium Chloride Ti 201 should not be given to a pregnant woman except when benefits clearly outweigh the potential risks.

Nursing Mothers: It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, nursing should not be undertaken when a patient is administered radioactive materials.

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

Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the safe use and handling of radioactive materials and whose experience and training have been approved by the appropriate government agencies authorized to license the use of radioactive substances.

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

HOW SUPPLIED: Thallium Chloride Ti 201 for intravenous administration is supplied as a sterile, nonpyrogenic solution containing at calibration time 37MBq/ml (1mCi/ml) of Thallium Chloride Ti 201, 3mg/ml sodium chloride, and 5mg/ml of hydrocortisone. The pH is adjusted with hydrochloric acid and/or sodium hydroxide solution. Vials are available in the following quantities of radioactivity: 81, 122, 162, 284, 325, 566, 871, and 9.5mCi of Thallium Chloride Ti 201. Thallium Chloride Ti 201 is supplied in vials with an expiration date of 5 days maximum after calibration time.

References:
8. Data on file, Boehringer Ingelheim Pharmaceuticals, Inc.
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Although general purpose SPECTS are common items in major nuclear medicine departments, the use of the dedicated brain SPECT instruments has increased only slowly. Because of an insufficient reimbursement system for SPECT brain scans, other clinical SPECT examinations are performed more frequently in departments of nuclear medicine.

The fundamental principle of dedicated brain SPECT is by no means similar to the principle used in the multi-purpose gamma camera SPECT (multi-detector SPECT). Further development of Kuhl’s Mark IV scanner into the more sophisticated TOMOMATIC SPECT has almost revolutionized the SPECT imaging market.

The key consideration for a dedicated brain SPECT is maximum count rate and sensitivity performance. An efficient dedicated brain SPECT requires a count rate and sensitivity that are 10 to 20 times higher than those obtained by conventional rotating 1-, 2-, 3-, and 4-head gamma cameras or similar systems based on the gamma camera principle.

Thus, a quality dedicated SPECT system is distinguished from the conventional gamma camera based system by fulfilling fundamental requirements for the quality of primary information, rather than by refining insufficient statistical data acquisition used to produce cosmetic/filtrated images in transversal, sagittal or coronal sections by refined reconstruction algorithms and image processing systems.

The sensitivity of the TOMOMATIC SPECT of 6 kcps/ml/mCi/slice with 9 x 9 mm spatial resolution obtained by Tc-99, using double focusing collimator technique and high count rates (up to 200 kcps with Xe-133 with a loss of less than 2 percent) is made possible by the multi-crystal technique. A combination of high sensitivity and count rate capability
DEDICATED VERSUS MULTI-PURPOSE SPECT (continued)

enables the TOMOMATIC SPECT device to make quantitative regional Cerebral Blood Flow (rCBF) images which can be repeated every 15 minutes using the Xenon isotope, with data acquisition time of only 4 minutes. Furthermore, this dynamic processing feature is an ultimate requirement for producing kinetic studies of new compounds and ligands.

DEDICATED SPECT SYSTEM DEVELOPMENT

In 1978 the first prototype of a multi-crystal TOMOMATIC SPECT was developed by E. Stokley, Ph.D., of the Southwestern Medical Center, University of Texas, Dallas, et al. This multi-crystal SPECT was taken into clinical routine in 1979 and delivered results which have not been overtaken by other SPECT systems except the TOMOMATIC devices.

At that time, the objective was to develop a three-dimensional method for the imaging of rCBF (regional Cerebral Blood Flow) during activation. A method which earlier successfully led to essential knowledge of the location of the main centers in the brain cortex and their functional activity during rCBF activation measurements was performed laterally and bilaterally by a multi-crystal gamma camera designed by MEDIMATIC called DYNAMATIC 254. This special gamma camera designed with 254 single NaI scintillation crystals used a focusing collimator and high resolution to measure count rates of 1,000,000 cps with a loss of less than 1%.

The clinical studies using Xe-133 were based on either invasive or non-invasive methods. The TOMOGRAPHIC replacement for the DYNAMATIC camera was a multi-crystal rotating four-camera unit system consisting of 4 x 64 single NaI crystal segments divided electronically into four slices. That SPECT, called TOMOMATIC 64, was installed in over 30 hospitals and clinics in the United States, Europe and Japan, where it is still used daily.

A further development in the four-slice TOMOMATIC 64 SPECT led in 1984 to release of the TOMOMATIC 564 based on VAX/DEC computer systems, which provided equal and/or improved results in five slices of the brain taken simultaneously. Dynamic data acquisition performed with data collection of 3.5 million counts in 4.5 minutes was based on Xe-133 or Xe-127 with a resolution of 12 mm during dynamic flow studies.

That improved system, which was created as a high-sensitivity device, could be collimated so intensively that it allowed processing of static images based on Tc-99 and I-123 with spatial resolution down to 6 mm. By 1991 more than ten of these more expensive models had been sold in the United States, Europe and Japan.

During that period, the fan beam collimator, which can perform examinations on premature infants and primates with a spatial resolution down to 3.5 mm, was developed by Douglas Jones, Ph.D. NIMH, Washington, D.C., et al, in 1990, and released by Medimatic for clinical use on premature infants in 1991.

DESIGN FUNDAMENTALS OF DYNAMIC SPECT

MAIN PROBLEM TO SOLVE IN SPECT: Good primary information during data acquisition ensures satisfactory SPECT results from each slice. Insufficient collected primary information may, of course, be compensated for by artificial calculations in the data processing. It is difficult to evaluate the results of those adjustments and corrections in regard to static
imaging based on Tc-99 or I-123 compounds, where it is mainly a question of allocating the time necessary to obtain a statistically sufficient number of counts per slice. The problems of primary data quality become evident when more demanding dynamic data acquisitions by Xe-133 or Xe-127 are involved.

For a slice thickness of 10 mm, a sufficient amount of collected data should be 2 million counts for data acquisition by Tc-99. If the time when the patient may not move is reduced as much as possible, a good time resolution is still required in order to obtain as good a spatial resolution as it is possible to get with the TOMOMATIC SPECT.

In TOMOMATIC SPECT, dynamic data acquisition means data acquisition that produces a SPECT image in a few seconds (30-45 sec.). Such short acquisition time is necessary in order to evaluate the clearance per voxel periodically with sufficient statistical certainty to allow each data acquisition during 3-5 periods to be used to calculate the blood flow per voxel (ml/min./100 g tissue), i.e. quantitative rCBF. Only dedicated brain SPECT systems such as the TOMOMATIC systems can achieve this, and consequently they are the only real potential competitors to the PET systems.

In contrast, static data acquisition involves collecting specific numbers of counts that are statistically sufficient to reveal even very small areas (voxels) of low activity. While the relative change in the collected number of counts forms the basis of the calculations in dynamic data acquisition, static data acquisition involves a specific number of counts that are reliable for image information (in this case 2 million counts).

The high sensitivity of the instrument is a decisive factor in determining data acquisition time. In that regard, TOMOMATIC is the only SPECT instrument able to collect a sufficient number of counts in a very short time. That ability results from the double-focusing collimator technique used in the TOMOMATIC SPECT. High SPECT sensitivity combined with an intense collimation provides a high spatial resolution that allows even very small non-active regional areas of the studied object to be revealed.

But it is not only spatial resolution that is important. Time resolution is also of great importance, especially for dynamic data acquisitions in which a large amount of activity is used to establish the rate of the regional clearance. At this point it should be noted that the TOMOMATIC SPECT systems do not allow any false addresses from the individual rotating camera surface at high count rates, which can happen when using the gamma camera technique of the multi-purpose SPECT systems. In the TOMOMATIC SPECT instruments each camera unit has been built with multicroystals covered by individual photomultipliers to ensure that each arriving photon that passes the collimator unit is slowed down by the individual crystals. That means that the position of the crystals is unambiguously characterized even at very high count rates.

If the fan beam collimator technique and high count rates are used in a double-focusing collimator configuration, a small collimator surface is projected on a large individual scintillation crystal surface by means of which a large number of counts limited to a single crystal can be used. Erroneous positioning can be avoided whether the count rate is small or large. This is the principle used in the new TOMOMATIC SPECT systems, as opposed to the new multi-detector gamma camera SPECT systems, where only one crystal can be divided electronically, which can result in errors in electronic positioning. Additionally, mechanical non-alignment problems may occur. That happens especially if the rotation speed is increased to a level of 6 turns per minute, which is necessary for dynamic quantitative measurement of blood flow. Not even the finest and most sophisticated computer correction programs will be able to correct such errors.

That is the reason why MEDIMATIC has always insisted on a single crystal technique and a double focusing standard, as well as a
fan beam collimator technique. MEDIMATIC has solved the SPECT problems by developing a series of SPECT instruments since the first TOMOMATIC 64 was launched in 1978. The series comprises seven different dedicated brain SPECT scanners, each having its own price range. They have all been developed based on Prof. Niels A. Lassen’s work in the field of clinical neurophysiology. The latest model is TOMOMATIC 864, which is also used for other kinds of SPECT than brain SPECT due to its variable aperture.

CLINICAL IMPACT OF TOMOMATIC SPECT: The dedicated brain SPECT instruments were designed with the specific purpose of imaging cerebrovascular conditions. Eighty to 90% of all neurologically conditioned diseases are caused by insufficient regional circulation in the brain. Until the launching of TOMOMATIC SPECT, objective examination methods, e.g. screening, were in great demand. In this respect, especially within apoplexy research, it has been important for quantitative flow to be determined, mainly using tests where autoregulation conditions could be examined and where the diamox test could reveal the functional capability of the collateral blood flow in case of blocked blood afflux to large brain segments.

In migraine research, quantitative flow measurement during and after a migraine attack is of great importance. Only dynamic measurements are able to indicate the relevant treatment. In contrast, static high resolution studies are of great importance in the diagnosis of diseases like Parkinsons, Alzheimers and other form of dementia.

In epilepsy research, surgical treatment of the temporal lobe after a TOMOMATIC SPECT has marked a new era in the treatment of this disease.

The development of routine clinical diagnosis based on dynamic and static high resolution SPECT studies now awaits only improved patient reimbursement, and the news about the effectiveness of the TOMOMATIC SPECT system to reach some conservative groups of doctors.

The most recent studies on primates and premature infants indicate even more important neurological applications, in which only the TOMOMATIC SPECT, which is the current leader and has no competitors, can demonstrate the value of the dedicated brain SPECT.

INDUSTRIAL IMPACT ON THE TOMOMATIC SPECT IN A COMPETITIVE MARKET: The SPECT manufacturer’s market has not been particularly stable in the past decade. Today, only Medimatic, which has enjoyed more than 20 years of stability in the field of brain diagnostic equipment and which is owned by the same group as when it was founded, is able to offer a series of SPECT devices for routine clinical application.

So far Medimatic has not encountered any further competition concerning time and spatial resolution. Looking back on the 12 years of intensive SPECT research shows that Medimatic’s stress on developing SPECT systems based on individual slice performance due to multi-crystals was the right choice. That is what has led to the reliable primary information that can make the dedicated brain SPECT a genuine clinical tool in neurology and neurological surgical treatment. It is a method that, when used together with CT or MR information, can provide indications on treatment requirements in the early stages of a disease.
FUTURE TOMOMATIC SPECT

New TOMOMATIC multi-crystal SPECT models will be released during 1992-93, once the initial clinical tests have been completed:

TOMOMATIC 348M: A mobile version with 144 scintillation channels optimized for high sensitivity and a count rate appropriate for dynamic measurements on the adult brain, as well as on the brain of premature infants and primates. Resolution down to 5 mm using fan beam collimator.

TOMOMATIC 864: A stationary 8-slice device equipped with 768 NaI crystal elements arranged in four rotating detectors and prepared for a special fan beam collimator technique with resolution of 5 to 6 mm in brain mode and 10 to 12 mm spatial resolution in heart mode. This model carries an adjustable aperture which can change the field of view to optimize the aperture for different types of examinations and collimator utilization.

BREAKING THE VICIOUS CIRCLE

At the beginning of 1992 it is amazing to observe the conservatism continually displayed by diagnosticians, i.e. neurologists, vascular surgeons, neurosurgeons and psychiatrists, in the leading hospitals and clinics. They are hesitant to order clinical examinations based on SPECT and consequently reluctant to support the purchase of special SPECT devices by by departments of nuclear medicine.

Unfortunately, there is still little or no demand for examination results based on data and image information of regional physiological states rather than qualitative description or imaging of the morphologic structures. That is why it is still a challenge for nuclear medicine specialists to work on convincing claimants and increasing the demand, before expensive dedicated brain SPECT instruments can be purchased.

That has already caused the departments of nuclear medicine to continue in the almost unbreakable vicious circle of buying "low-cost general purpose multi-detector SPECT devices which do not provide applicable and satisfactory diagnostic results to the groups of claimants for their decisive process of correct patient treatment." The acception of irrelevant diagnostic devices reduces demand for brain SPECT examinations, and the limited number of patients means that the departments of nuclear medicine may have to continue with the insufficient multi-purpose instruments.

In future, progressive nuclear medicine departments will purchase instruments (cheap or expensive) only if they are convinced they can fulfill latent needs that will exist and increase in the future. Consequently, in future departments of nuclear medicine will have to equip themselves with special instruments dedicated to unique specialties such as the brain, the torso and/or the extremities.

IN SUMMARY:

To save money by a low-cost purchase which does not correspond to a no-cost purchase can easily be an investment error. It is better to obtain the understanding of claimant groups if you are responsible for nuclear medicine before purchasing an insufficient SPECT for general purpose. TOMOMATIC SPECT has been dedicated to the brain and the individual brain slices from the outset.
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Repetitive xenon studies before (left) and after (right) Diamox - TOMOMATIC 232

Muscarinic neuro-receptor study - IQNB-123,
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Xe-133 activation study. Left: Baseline study, resting with eyes closed. Right: Open eyes and right hand movement.

Comparative study using ECD (right) and Xe-133 (left)

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Continuing Medical Education Primary Focus of The Society of Nuclear Medicine's 39th Annual Meeting
June 9-12, 1992
Los Angeles, California

The 39th Annual Meeting of The Society of Nuclear Medicine will be held in Los Angeles, California on Tuesday, June 9 through Friday, June 12, 1992. The Los Angeles Convention Center is the site of most of the educational activities for this meeting.

CONTINUING EDUCATION ACTIVITIES
A primary focus for every SNM Annual Meeting is the Continuing Education activities that are offered for physicians, scientists, pharmacists, and technologists. This year we are pleased to offer 11 categorical seminars and 41 continuing education courses. There will also be a Nuclear Medicine Review Course which is geared for the nuclear medicine resident preparing for the ABNM boards and others who wish to refresh their knowledge for practice in nuclear medicine.

All of the categorical seminars will take place on Monday, June 8 from 8:30 am-2:30 pm. All other continuing education sessions will occur over the dates of the meeting.

This year, for the first time, continuing medical education credits will be offered along with VOICE credits for technologist programs. The Scientific and Teaching Sessions Committee invites all physicians to participate.

The Society of Nuclear Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians.

The Society of Nuclear Medicine is approved by the American Council on Pharmaceutical Education as a provider of continuing pharmaceutical education.

Technologist Section courses are approved for continuing education credit by the Technologist Section of The Society of Nuclear Medicine under the criteria and guidelines established by the Council on the Continuing Education Unit.

TECHNICAL EXHIBITS
Another important component of the meeting is the technical exhibition, where the most advanced products and services for the nuclear medicine practitioner will be displayed. Attendees will have the opportunity to speak with technical experts and to see demonstrations of new equipment in an atmosphere free from the pressures of their busy practices.

Suppliers to the nuclear medicine community traditionally take advantage of the Society's Annual Meeting to showcase the innovations developed over the past year and to introduce new products. They make their greatest effort to impress and influence their most important customers—our attendees.

This year will be no different: several long-time exhibitors have increased their space, and we anticipate an even larger show, with more exhibitors than 1991's record-breaking meeting.

SPECT BRAIN IMAGING PRACTICUM
This year's special innovation is a hands-on brain SPECT workshop for physicians desiring to optimize their practice and interpretative skills in this area. These workshops will be offered twice each day on Wednesday and Thursday, June 9-10, 1992, 8:30 am - 10:00 am and 3:30 pm - 5:00 pm. This workshop will have a maximum of 30 registrants for each session, so early sign-up is strongly suggested. Registration materials for this SPECT workshop will be included in the matrix mailing.

For further information contact:
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Positions Available

Faculty

ASSISTANT PROFESSOR, DIVISION OF NUCLEAR MEDICINE — University of Kentucky, Lexington, is seeking applicants in Nuclear Medicine. Candidates should be Board certified or eligible in Nuclear Medicine. The successful candidate will be expected to have expertise in the clinical activity of the division as well as participate in research and teaching. Please address replies along with a CV to Dr. U. Yun Ryo, M.D., Ph.D., Professor and Director, Division of Nuclear Medicine, Department of Diagnostic Radiology, University of Kentucky Medical Center, Lexington, KY 40536-0084. UK is an Equal Opportunity Employer.

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SNY, Stony Brook, Division of Nuclear Medicine. FELLOWSHIP position available for July 1992. For applications call (516) 444-2470.

Physician

Oregon Health Sciences University, Portland. Oregon invites applications for a FACULTY POSITION available immediately in NUCLEAR MEDICINE. This is a full-time position or full time divided between nuclear medicine and another division of diagnostic radiology. Position requires that candidates be certified by either American Board of Radiology (Special Competence in Nuclear Radiology) and/or American Board of Nuclear Medicine. Send CV to Dr. Michael Weinbaum, MD, Chairman, Diagnostic Radiology, UHN-72, Oregon Health Sciences University, Portland, OR 97201. OHSU is an affirmative action equal opportunity employer.

MEDICAL DIRECTOR. Department of Nuclear Radiology, Mercy Hillcrest Hospital has an immediate full-time position available in the nuclear medicine department. Candidates should be board certified in nuclear medicine or radiology with special competence in nuclear medicine. Merida Hillcrest is an acute care community hospital of 320 beds and a radiotherapy staff of eight. The nuclear medicine department has 5 gamma cameras (4 with SPECT capability) including the Picker Prism Triple-Head. The technical staff consists of 9 technologists. Current volumes annually are 7,000 imaging and 20,000 radioisotope studies. Candidates should have current certification to work at Ronald J. Ross, Director, Department of Radiology, Merida Hillscrest Hospital, 3700 Mayfield Road, Cleveland, OH 44124. (216) 449-4595.

NUCLEAR MEDICINE PHYSICIAN. The University of California, Davis, School of Medicine has a full-time faculty position available in the nuclear medicine division of the Department of Radiology. Appointment will be at the assistant/associate/full professor level (in-residence or professor of clinical radiology series). Candidates must be board certified in nuclear medicine, eligible for licensure in California, and have an academic background in nuclear medicine. Since this position will be open until filled please forward curriculum vitae, a letter outlining background and interests in teaching/research, and the names of five references as promptly as possible. Applications will not be accepted after March 31, 1992. Reply to: William E. Brant, MD, Chairman, Search Committee for Nuclear Medicine Physician, Department of Radiology, 236 Stockton Boulevard, Ticon I Building, Sacramento, California 95817. The University of California is an Equal Opportunity/Affirmative Action Employer and encourages applications from members of minority groups and women.

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Physicist

PHYSICIST. The University of Pittsburgh Medical Center, Department of Radiology, is seeking a full-time Nuclear Medicine Physicist. The candidate must be Board certified or Board eligible, and possess a Ph.D. in Physics/Medical Physics. The position involves physics support for the clinical activities of a large, academic nuclear medicine program and includes quality control, teaching of residents, and other scientists in nuclear medicine and involvement in support activities of nuclear medicine related research. The applicants are expected to have a good working knowledge of gamma cameras, SPECT technology, and computers. The physicist will be part of a clinical team dedicated to high quality and innovative clinical nuclear medicine. Faculty rank will be based on previous experience and salary and fringe benefits are very competitive. Inquiries and curriculum vitae should be addressed to: Manuel E. Brown, M.D., Division of Nuclear Medicine, University of Pittsburgh Medical Center, DeSoto at O'Hara Streets, Pittsburgh, PA 15213. University of Pittsburgh is an Affirmative Action/Equal Opportunity Employer.

Technologist

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In return for your expertise, RAS offers a competitive salary/benefits package, a sign-on bonus and relocation assistance. Our Northern California location features affordable housing and a wide range of recreational activities, plus close proximity to San Francisco, Lake Tahoe and Yosemite. For consideration, send your resume to: RAS, Dept. P.E.T., 1800 7th Street, Sacramento, CA 95814-3056. EOE.

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Mount Sinai Hospital, a progressive community teaching hospital, is seeking an experienced technologist to join our Nuclear Medicine Department.
This is a key position, responsible for providing imaging and processing for a wide range of Nuclear Medicine procedures. We offer an innovative environment to challenge and develop your professional skills, including state-of-the-art SPECT. Candidates must be registered, with a minimum of 3-5 years Nuclear Medicine experience. On-call is optional.
In addition to the hire bonus, we offer a revised competitive salary scale, plus an excellent paid benefits program and free secure parking. Relocation assistance is available. Please send your resume to Colette Austin-Greene, Human Resources, Mount Sinai Hospital, 500 Blue Hills, Avenue, Hartford, CT 06112.

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Presbyterian Hospital of Dallas, a 934-bed acute care medical complex, is recognized as the premier regional healthcare system serving north and east Texas.
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• Nuclear Medicine Computer Science
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June 8, 1992
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For details write:
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Robert Wood Johnson Medical School
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Abstract Deadline is May 15, 1992

Abstracts may be submitted on:
Radioimmunity of antibodies * Physics and dosimetry of
radiolabeled antibodies * Radiation biology
* Experimental studies of targeting with monoclonal
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responses to monoclonal antibodies

Abstract forms and information:
CMMI, One Bruce Street, Newark, NJ 07103
Telephone (201) 456-4600/Texax (201) 456-7047
Registration fee: $400, $470 after July 1.

West Virginia University
Health Sciences Center

School of Medicine PET Center

The WVU School of Medicine invites applications for the
staffing of its new PET Center expected to open in 1993. Openings
exist for a Center Director and several other members of
the professional staff (e.g., Radiochemists, Radiophysicists). The
Director, who will report to the Dean of the School of Medicine,
should hold an M.D., Ph.D., or equivalent degree and must have
experience with PET technology, particularly its research applica-
tions. The other members of the professional staff will be selected
by the Director to complement his or her own expertise. In each
case, salary and level of academic appointment will be com-
mensurate with experience. We expect to appoint the Director
approximately one year before opening the Center to provide him
or her with the opportunity of participating in the planning
process.

This search will remain active until the positions are filled, and
thus there are no formal application deadlines. However, those
applications received by April 15, 1992 will be assured of con-
sideration during the first cycle of review. Applicants should send
a curriculum vitae, a summary of professional goals, and the
names of three references to:

good A. Hedge, Ph.D.
Chairman, PET Center Search Committee
Associate Dean for Research and Graduate Studies,
and E.J. Van Liere, Professor
West Virginia University School of Medicine
2267 Health Sciences South
Morgantown, WV 26506

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MONASH
medical centre
Director of Nuclear Medicine

Applications are sought from appropriately qualified medical practitioners for this position. Monash Medical Centre is a 747 bed modern teaching hospital in the south east of Melbourne affiliated with the Monash University Medical School. The Department of Nuclear Medicine is part of the Division of Diagnostic Imaging which is in a physically new facility and provides all services but M.R.I. (for which a submission is in place). The Medical Centre offers tertiary clinical services in all disciplines.

The current staff component within the Department comprises a full-time Director, a part-time Physician in Nuclear Medicine, a full-time trainee Registrar and five Technologists. The new Director appointment can either be a full-time position with the right to private practice or a maximum part-time position with private practice in an arrangement agreed to between the Board of Management and the Monash Medical Centre Diagnostic Imaging Group.

Enquiries regarding further details of this position ought be directed to Dr Fred Jensen, Chairman, Division of Diagnostic Imaging on (613) 550 2200 or (613) 550 2274.

Application forms may be obtained from Miss Fay Jones on (03) 550 2745 and ought be returned to Dr Syd Allen, Executive Director - Medical Services, Monash Medical Centre, Locked Bag 29, Clayton, Victoria, 3168, Australia. Closing date for applications is 11th April 1992.

The Monash Medical Centre is an Equal Opportunity Employer and promotes a smoke-free work environment.

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Nuclear Pharmacist

The Pharmacy Department at Kaiser Permanente’s Los Angeles Medical Center, a 628 bed tertiary-care, teaching facility, is seeking a highly motivated pharmacist to provide Nuclear Pharmacy services. Candidates must possess a knowledge of the basic principles of radioactive materials and radiation safety and be licensed or eligible for licensure in California.

Responsibilities include conferring with and assisting nuclear medicine personnel in the care and treatment of patients who present for nuclear diagnostic/therapeutic procedures. The selected candidates will provide drug information, drug preparation and distribution of radioactive and non-radioactive pharmacy products. Research and student teaching opportunities are available.

Kaiser Permanente offers an excellent salary and benefits package, including employer paid medical/dental/vision care coverage, dependent care, tax sheltered annuity plan, pension plan, paid educational leave and a generous vacation plan. For immediate consideration, please call or send resume to: Gail Franklin, Kaiser Permanente, Dept. JOU-108-03/01/92, 1515 N. Vermont Ave., 2nd Floor, Los Angeles, CA 90027-5337, (213) 667-4747. We are an Equal Opportunity/Affirmative Action Employer.

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Pumpout System for Drum Compactors

S&G Enterprises announces a pumpout system for hazardous and other liquids squeezed out during compaction of materials within a drum. Commonly compacted materials that contain liquids include paint filters, cleaning rags, bottles, cans, absorbent papers, and medical wastes. In some cases, up to one-third of a drum’s volume may be filled with liquid. The system automatically removes such liquids, increasing the drum’s storage capacity and reducing ultimate disposal costs. In operation, as the hydraulic ram shaft descends for compaction, liquids squeezed out of the material flow upward, onto the compaction head. Removal ports in the compaction head collect the liquids, which are then pumped out of the drum through the hydraulic shaft for disposal or treatment. The compactor can be used with the pumpout system turned on or off. The pumpout system is an optional feature available with all Ram Flat compactors. Ram Flat models are designed to compact materials within an 85 gallon drum or smaller. Bulletin RFPO 791, Lorin Griffith, S & G Enterprises, 5626 N. 91st Street, Milwaukee, WI 53225. (800) 233-3721.

Please see page 50A

Medical Online Database

Maxwell Online, Inc. announces Colleague Consult, their new online database. Developed for the new or occasional online database searcher who needs immediate access to current medical information, Colleague Consult leads the user through an online computer search of 25 databases to locate the necessary information. The system asks the user for the author’s name, publication title, or subject keyword and then responds in seconds with all relevant citations found. Users can access a wide range of biomedical databases with the system—including MEDLINE—and the complete text of more than 70 medical journals, textbooks, and other publications such as The New England Journal of Medicine, The Lancet, and Annals of Internal Medicine. Colleague Consult does not require a separate password or account and can be invoked at any time while the searcher is using Maxwell Online’s BRS Colleague. Maxwell Online, Inc., 8800 Westpark Drive, McLean, VA 22102. (703) 442-8990 or (800) 456-7248.

Please see page 50A

Proton Therapy System

Ion Beam Applications, s.a. and Sumitomo Heavy Industries, Ltd. have joined efforts to create a new proton therapy system consisting of a 230 MeV fixed energy cyclotron, beam transport equipment, isocentric or fixed gantries, dose monitors, and computerized controls. It is patient-dedicated, designed for in-hospital operation and will be delivered as a complete, turn-key facility. It has the capacity for over 20,000 therapy sessions per year. Ion Beam Applications, S.A., Chemin du Cyclotron, 2, B-1348 Louvain-la-Neuve, Belgium. 32-10-47-58-11.

Please see page 50A

Automatic Chemical Mixer

The new CADI XL Automatic Chemical Mixer from Picker International is designed to improve the quality and consistency of radiographic chemistry. The compact mixer can fit beneath a counter top and delivers precisely mixed developer and fixer to one or two film processors. The unit improves safety and quality because chemicals remain factory-sealed and undiluted until it punctures the seal during the mixing process. Because the chemistry is sealed from the factory to the film processor, the possibility of employee contact with processing chemicals is almost eliminated. All necessary safety and handling information is plainly labeled on every container, simplifying OSHA compliance and minimizing right-to-know concerns. All three-part developers begin to break down as soon as they are mixed, losing 40% of their original stability in just two days. The unit requires water pressure of only 15 PSI to precisely mix every batch of chemistry, assuring proper dilution and eliminating human error. The unit uses CADIX-Pak factory concentrates that are set directly onto the mixer. The automatic mix cycle operates unattended, enabling employees to load a new batch of chemistry at their convenience. The new batch remains sealed until the current batch is depleted. This improves quality by minimizing chemistry oxidation and breakdown. Picker International, Inc., P.O. Box 739, Berea, OH 44017. (216) 473-3539.

Please see page 50A
Spectroscopy Amplifier

Canberra Nuclear announces the Model 2026 Spectroscopy Amplifier, which comes in a compact single width NIM package with features for high-resolution spectroscopy. The unit features triangular or gaussian shaping for high-energy resolution; differential input for input noise reduction; super fine gain for precise peak locations; pulse pileup rejection/live time correction circuitry for improved spectral data and more accurate activity calculations; and automatic PUR threshold and BLR rate and BLR threshold adjustment circuits for easy set-up and consistency. The model 2026 is compatible with Canberra’s full line of NIM products including optical and transistor reset preamplifiers. Canberra Industries Inc., One State Street, Meriden, CT 06450. (203) 238-2351.

Please see page 50A

Radiation Safety Video Library

Diagnostic Technology Consultants, Inc. has developed a Radiation Safety Video Library designed to assist with the increasing requirements for in-service education. It provides a cost-effective way to train all personnel who must work around radiation producing machines or radioactive materials. Each video focuses on a specific area of concern and provides a complete radiation safety course for those involved. Each instructional video tape in the library series is accompanied by a book including a number of teaching aids such as a sign-in sheet indicating who attended the presentation, a test, an in-depth answer key, a handy glossary of terms, a certificate of completion, and other helpful information. Topics in the radiation safety video library are: environmental services, security, procedures for nurses involving iodine-131 therapy patients and brachytherapy patients, general radiation safety for radiology and nuclear medicine, pregnancy and the radiation worker, procedures for the cardiac catheterization lab; and ALARA for administrators. Diagnostic Technology Consultants, Inc., 4747 Troost, Kansas City, MO 64110. (816) 753-2985 or (800) 753-4DTIC.

Please see page 50A

New Products

Nuclear Medicine Syringe Carrier

JRT Associates announces their JRT EURO-LOCK Deluxe Syringe Carrier. The product features a 1/8” lead shielding incased in medical grade stainless steel, which leaves no exposed lead. Its extra length facilitates radiopharmacy syringe holders and 10cc syringes with needles and needle covers left on. A high handle provides easy access even while the syringe carrier is being held. All joints are welded to assure a long usable life. The unit also features a European type spring tension latch, an extra long carrier box, and padded footings. JRT Associates, 116 S. Central Avenue, Elmsford, NY 10523, (914) 592-2929.

Please see page 50A
The Journal is testing a new method to enable you to get information on a more timely basis from our advertisers.

Listed below are the companies that have advertised in this issue, as well as those that have been mentioned in the New Products section. Simply fill out the form and FAX it to the Society (FAX: 212/545-0221), and we will send it to the advertiser.

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General inquiries to:
Joan S. Masjiur, MD
Chairman of the Organizing Committee
Department of Nuclear Medicine
School of Medicine Padjadjaran University
Dr. Hasan Sadikin Hospital
Jalan Pasirkaliki 192 Bandung 40161 Indonesia
Tel. 62-22-85066 Fax 62-22-213997 and 62-22-211282

Abstract Inquiries to:
Wilfrido M. Sy, MD, Chairman,
Scientific Program Review Committee
(North and South America)
The Brooklyn Hospital Center
Department of Nuclear Medicine
121 DeKalb Avenue
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SPECT Brain Imaging Clinical Fellowship
Department of Radiology
Section of Nuclear Medicine

BENEFIT:
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- Knowledge of image acquisition and reconstruction.
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SPONSORSHIP:
This program is sponsored by the Medical College of Wisconsin.

TUITION:
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The Medical College of Wisconsin is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing education for physicians. Accordingly, the Medical College of Wisconsin designates this continuing education activity as meeting the criteria for 13.00 hours in Category I toward the Physician's Recognition Award of the American Medical Association.

Nuclear Medicine Technologists who attend the SPECT Brain Imaging Clinical Fellowship are eligible for 1.0 VOICE credit.

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At Nordion, we are proud of our history of service to the nuclear medicine community, and we are committed to meeting your needs for the future.