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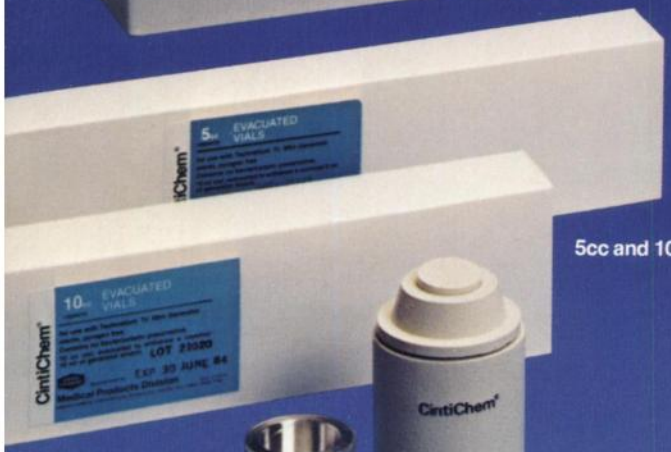
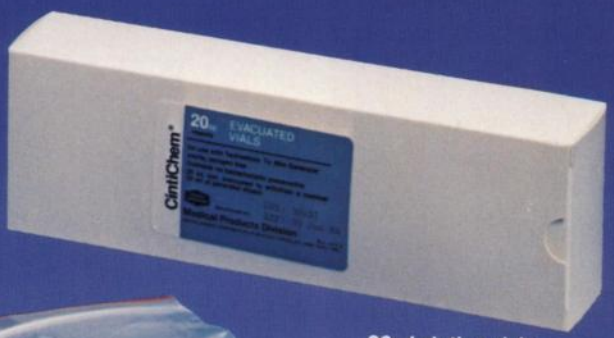
Technetium Tc 99m Generator

Secondary shield to further reduce radiation



5cc and 10cc elution vials



20ml elution vials available on request

Elution vial shield

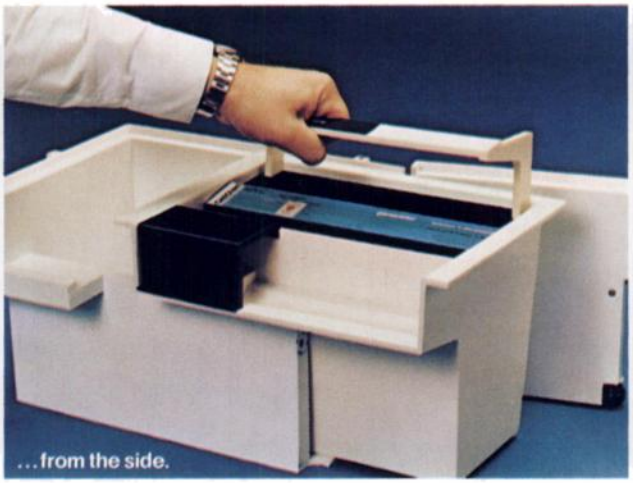
Adaptors for various elution vials

Sterile needle pack and labels furnished with each generator

TECHNETIUM 99m

GENERATORS

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



Featuring:

- Indicated for use in adults and children for urinary bladder imaging (direct isotopic cystography).
- The only Generator with an "open/closed" valve to eliminate possible leakage, both during shipment and in your hot lab.
- Unique horizontal elution procedure increases ease of use and eliminates needle-vial alignment problems.
- A new sterile needle is utilized for each elution, reducing the chances of a septic or pyrogenic situation occurring in routine clinical usage. This method is superior to competitive dry column systems where the same needle assembly is used for the life of the product.
- Fission product molybdenum 99 is used in the Technetium 99m Generator to provide Sodium Pertechnetate Tc99m activity concentrations sufficient for bolus injections.
- Internal saline reservoir eliminates the need to stock saline vials.
- Evacuated elution vials are available in 5cc, 10cc, and 20cc volumes, allowing you to optimize the elution concentration to meet your needs.
- Optimum shielding design minimizes radiation to personnel in work areas, providing maximum protection.
- Generator is compact, providing for optimum maneuverability. Generator handle and shipping carton provide for ease in handling and lifting.

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TECHNETIUM Tc 99m GENERATOR for the Production of Sodium Pertechnetate Tc 99m

DESCRIPTION: The Technetium Tc 99m Generator is prepared with fission produced Molybdenum Mo 99 absorbed on alumina in a lead-shielded column and provides a means for obtaining sterile pyrogen-free solutions of Sodium Pertechnetate Tc 99m in sodium chloride injection. The eluate should be crystal clear. With a pH of 4.5–7.5, hydrochloric acid and/or sodium hydroxide may have been used for pH adjustment. Over the life of the generator, an elution will contain a yield of 80% to 100% of the theoretical amount of Technetium Tc 99m available from the Molybdenum Mo 99 on the generator column.

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

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

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

CONTRAINDICATIONS: None known.

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

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

Carcinogenesis, Mutagenesis, Impairment of Fertility

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

Pregnancy Category C

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

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

Nursing Mothers

Technetium Tc 99m is excreted in human milk during lactation, and therefore formula feedings should be substituted for breast feedings.

Pediatric Use

See **Indications** and **Usage, dosage** and administration. See also description of additional risk under **warnings.**

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.

The generator should not be used after 16 days from the date and time of calibration.

At time of administration, the solution should be crystal clear.

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

HOW SUPPLIED: Sodium Pertechnetate Tc 99m is supplied as a Molybdenum Mo 99/Technetium Tc 99m generator in sizes from 830 millicuries up to 16,600 millicuries (in approximately 830 millicurie increments) of Molybdenum Mo 99 as of 10:00 P.M. Eastern Time of the day of calibration. The TECHNETIUM Tc 99m GENERATOR consists of:

1) sterile generator, 2) Sodium Chloride Injection source, 3) 10 cc sterile evacuated vials, 4) sterile needles, 5) elution vial shield* 6) finished drug labels. Elution vials in 5 cc and 20 cc sizes are available upon request.

*initial order only

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

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and

June, 1983
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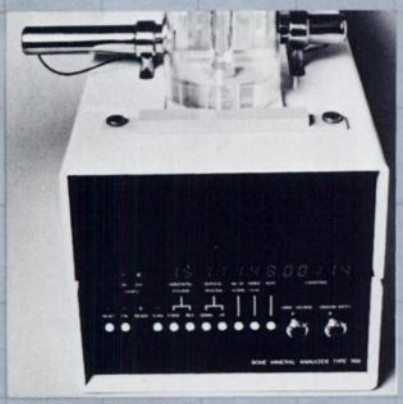

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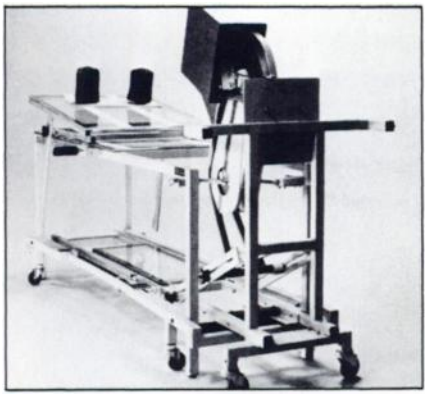

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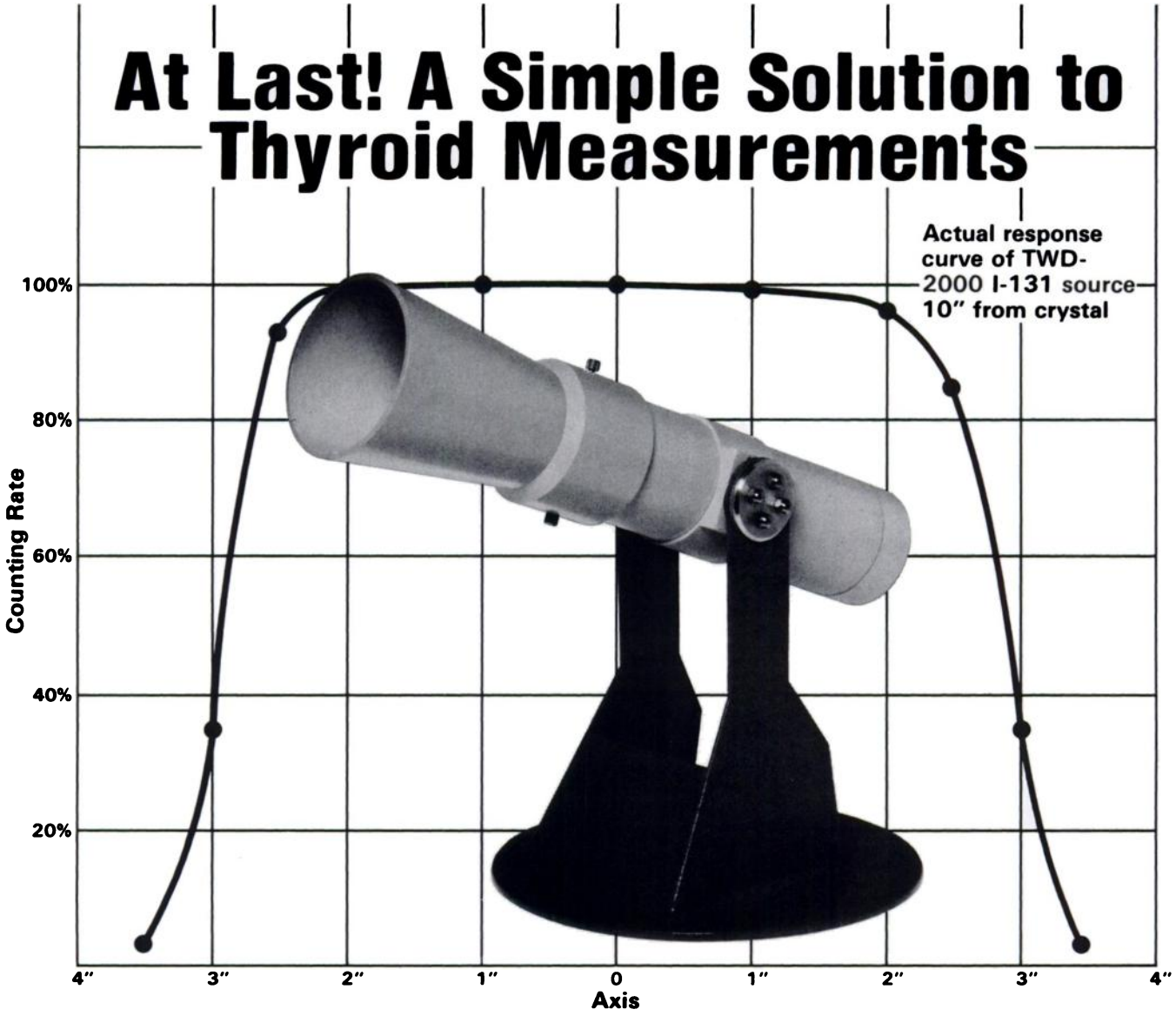

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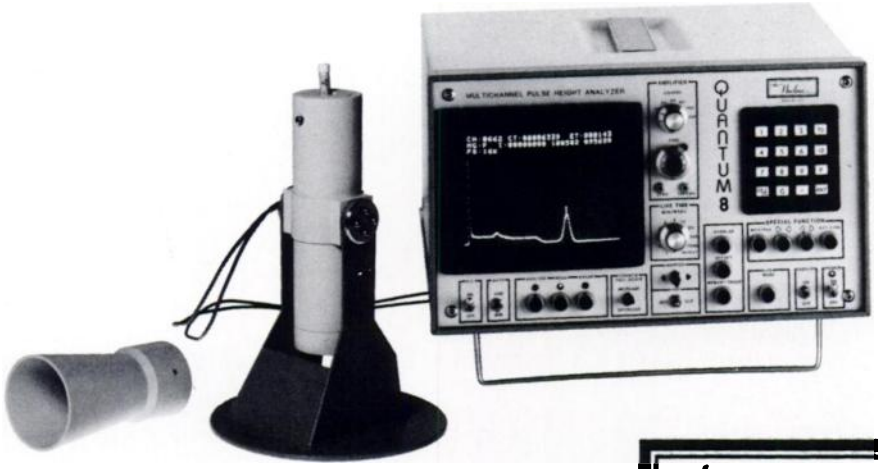

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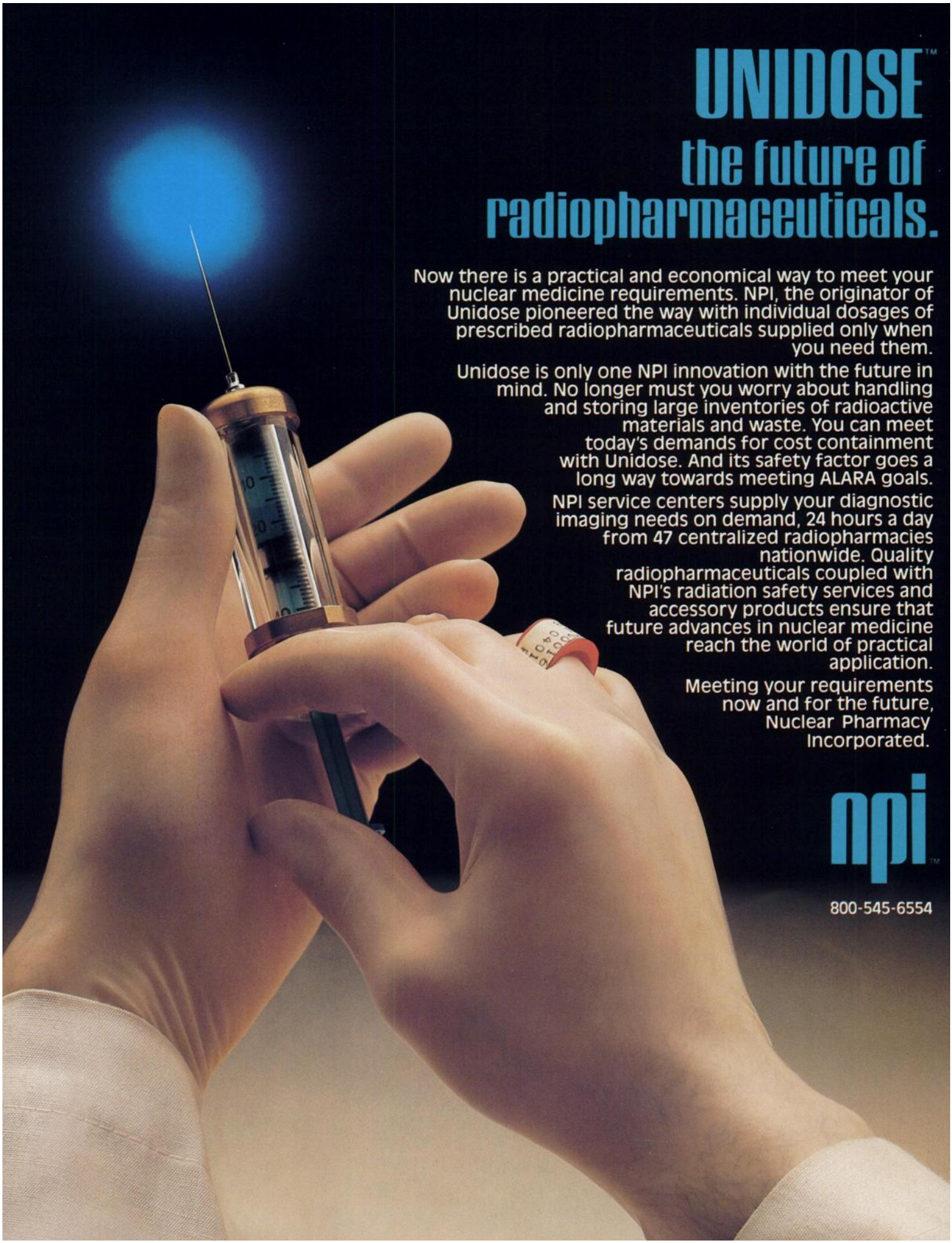
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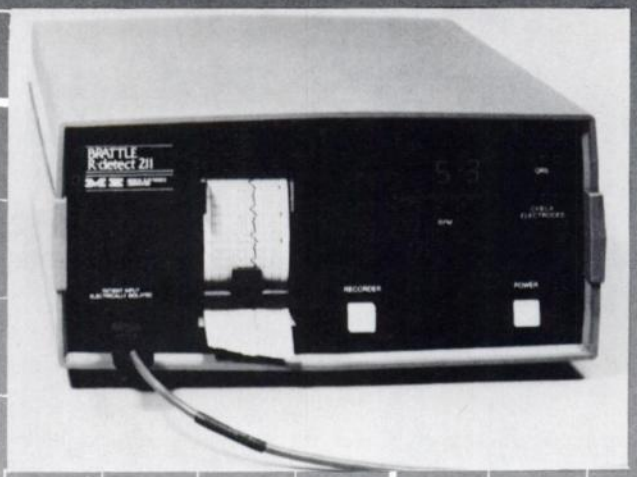
MODEL 210



MODEL 211

The BRATTLE R-DETECT offers you fully automatic R-wave triggering and is compatible with all nuclear medicine computers. In addition, the model 211 has a strip chart with EKG and event marker indicating the exact location of the R-DETECT signal.

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- Compatible with all nuclear medicine computers
- Stripchart with EKG and R-DETECT event marker (model 211 only)

ME

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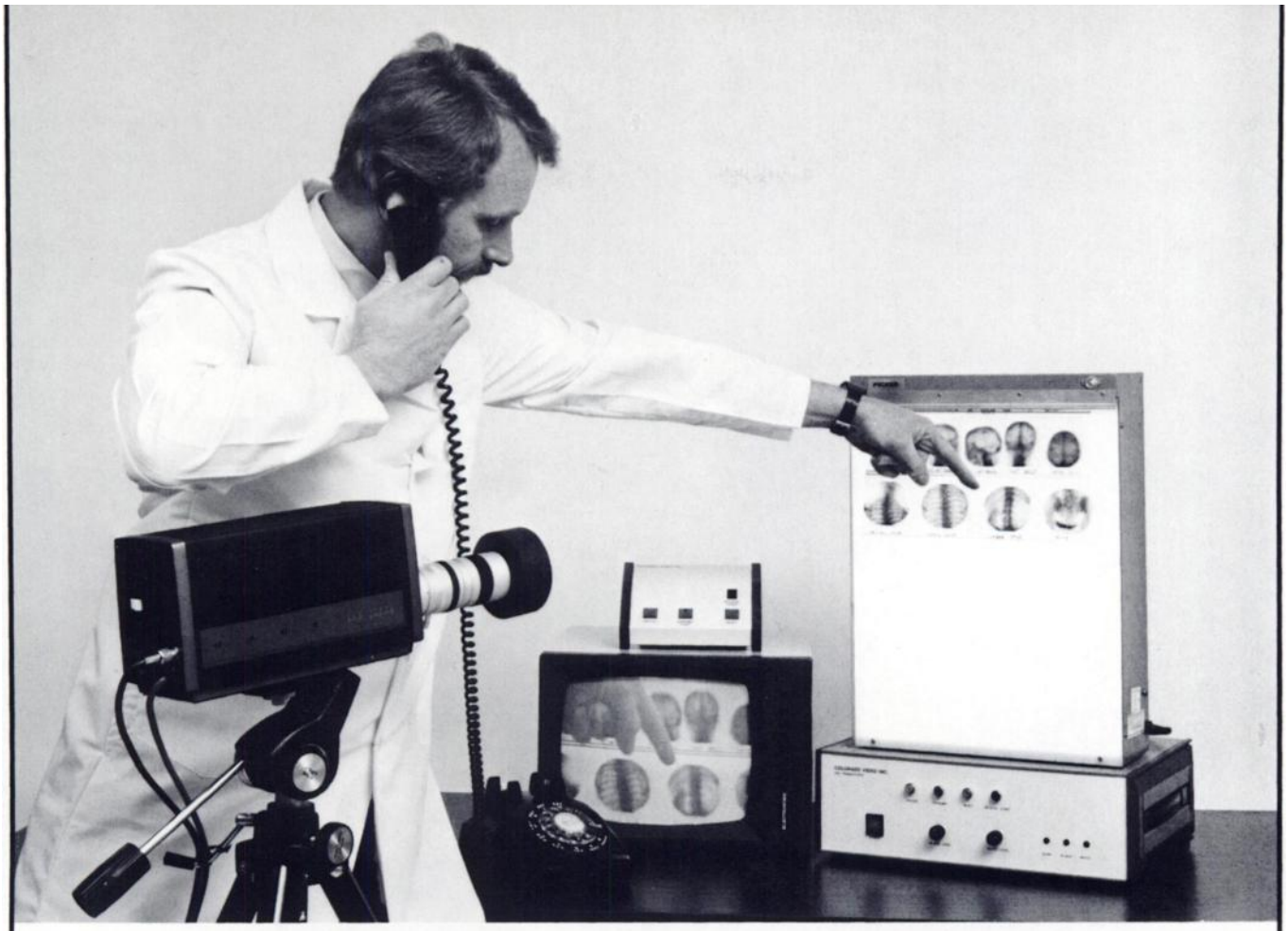

TELERADIOLOGY

Some nuclear medical scans may require on-the-spot diagnoses. Because Slow-Scan Television (SSTV) transmits images by ordinary telephone, you can review scans and make preliminary diagnoses even when you are not at your primary location. With the visual assistance of SSTV, imaging specialists can order additional tests if necessary or recommend that treatment proceed. There is little delay, regardless of your location.

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"Diagnostic Quality..."[1] Skeletal Images in Two Hours!

Mallinckrodt
OSTEOSCAN®-HDP
(Technetium Tc 99m Oxidronate Kit)

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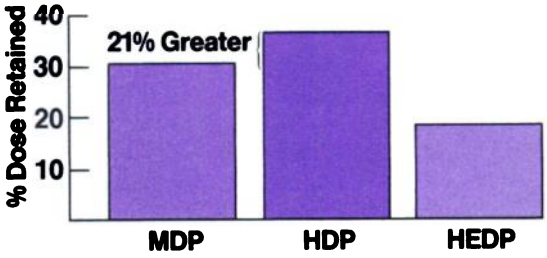
Mallinckrodt®

Clinical Studies Verify the Two-Hour Advantage of OSTEOSCAN-HDP Over MDP in Skeletal Imaging

Higher Bone Uptake Than MDP at Two Hours[2]

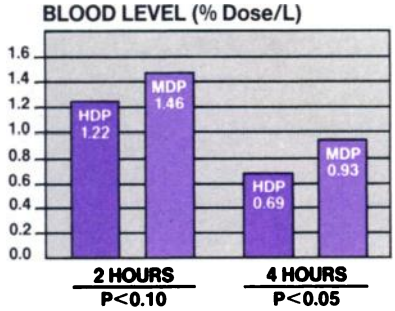
"Image quality is principally related to the absolute retention of the skeletal imaging agent on bone and the time available to allow the soft-tissue tracer component to be excreted by the kidneys."[2] In clinical comparisons,[2] OSTEOSCAN-HDP averaged 21% higher whole body retention than MDP and 99% higher than HEDP. Another comparative study showed that "HDP had a significantly greater bone/background ratio at 2 hours than MDP...."[3]



Rapid Blood Clearance... Up to 16% Higher Bone to Soft-Tissue Ratios Than MDP[4-5]

In clinical use of OSTEOSCAN-HDP, approximately 6% of the dose remained in the blood at two hours post-injection.[5] (No other bone-imaging agent clears faster.) *The resultant low soft-tissue levels permit early imaging and contribute to high-resolution images.*

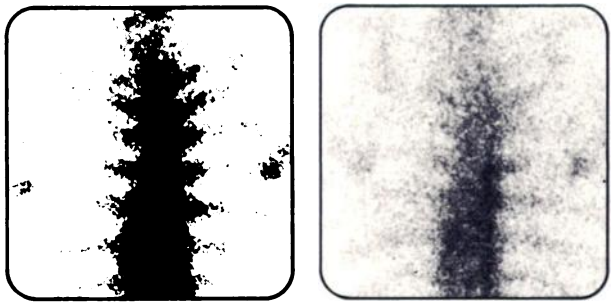
AVERAGE VALUES—10 PATIENTS[5]



NOTE: 2-hr. blood levels of HDP are significantly lower than MDP indicating faster blood clearance.

Side-by-Side Comparisons Rated HDP Images "Better" at Two Hours

In a controlled multi-center crossover study,[7] HDP was found to give images of better quality than MDP at a dose-to-image time of two hours.



SIDE-BY-SIDE COMPARISON OF IMAGES AT 2 AND 4 HOURS[7]

Number of Patients	Dose-to-Image Time	Image Quality Grade (1=excellent, 8=poor) HDP	MDP
28	2 hours	2.78 ± 0.11*	3.11 ± 0.14
28	4 hours	2.37 ± 0.16	2.29 ± 0.16

*Significantly different ($p < 0.05$)

Scintiphotos courtesy of Howard J. Dworkin, MD, and William C. Porter, Pharm. D., Wm. Beaumont Hospital, Royal Oak, Michigan.

Diagnostic-quality skeletal images in two hours...an important contribution to departmental productivity and patient convenience.

To arrange an evaluation of OSTEOSCAN-HDP, contact your Mallinckrodt representative today.

References

1. Pauwels EKJ, Blom J, Aarts JCNM: A comparison between whole body scans made at two hours and three hours after intravenous injection of Tc-99m HDP as to image quality and lesion detectability. *Clin Nucl Med* 9:75-78, 1984.
2. Fogelman I, Pearson DW, Bessent RG, et al: A comparison of skeletal uptakes of three diphosphonates by whole body retention: Concise communication. *J Nucl Med* 22:880-883, 1981.
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4. Domstad PA, Coupal JJ, Kim EE, et al: 99mTc-Hydroxymethane Diphosphonate: A new bone imaging agent with a low tin content. *Radiol* 136:209-211, 1980.
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6. Silberstein EB: A radiopharmaceutical and clinical comparison of 99mTc-Sn-Hydroxymethylene Diphosphonate with 99mTc-Sn-Hydroxyethylidene Diphosphonate. *Radiol* 136:747-751, 1980.
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Please see next page for Osteoscan-HDP prescribing information.▶

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OSTEOSCAN®-HDP

Technetium Tc99m Oxidronate Kit

DESCRIPTION

OSTEOSCAN-HDP (Technetium Tc99m Oxidronate Kit) is supplied as a lyophilized powder, packaged under nitrogen in vials for intravenous administration after reconstitution with ADDITIVE-FREE sodium pertechnetate Tc99m. Each vial contains 2.0 mg oxidronate sodium and 0.16 mg stannous chloride as active ingredients, and 0.56 mg gentisic acid as a stabilizer. The contents of the vial are sterile and non-pyrogenic.

This radiopharmaceutical diagnostic agent, when reconstituted with ADDITIVE-FREE sodium pertechnetate Tc99m forms a complex of unknown structure.

Physical Characteristics

Technetium Tc99m decays by isomeric transition with a physical half-life of 6.02 hours[1]. Photons that are useful for detection and imaging studies are listed in Table I.

Table I. Principal Radiation Emission Data

Radiation	Mean % Disintegration	Mean Energy (keV)
Gamma-2	88.96	140.5

1. Martin, M.J., Ed., Nuclear Decay Data for Selected Radionuclides, ORNL #5114, p. 24, March, 1976.

External Radiation

The specific gamma ray constant for Technetium Tc99m is 0.8 R/millicurie-hr at 1 cm. The first half-value layer is 0.2 mm of Pb. A range of values for the relative attenuation of the radiation emitted by this radionuclide that results from interposition of various thicknesses of Pb is shown in Table II. To facilitate control of the radiation exposure from millicurie amounts of this radionuclide the use of a 2.5 mm thickness of Pb will attenuate the radiation emitted by a factor of about 1,000.

Table II. Radiation Attenuation by Lead Shielding

Shield Thickness (Pb) mm	Coefficient of Attenuation
0.2	0.5
0.8	10^{-1}
1.6	10^{-2}
2.5	10^{-3}
3.3	10^{-4}

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

Table III. Physical Decay Chart; Tc99m, half-life 6.02 hours

Hours	Fraction Remaining	Hours	Fraction Remaining
-5	1.778	5	.562
-4	1.585	6	.501
-3	1.413	7	.447
-2	1.259	8	.398
-1	1.122	9	.355
0*	1.000	10	.316
1	.891	11	.282
2	.794	12	.251
3	.708	18	.126
4	.631	24	.063

*Calibration Time

CLINICAL PHARMACOLOGY

During the 24 hours following injection, Technetium Tc99m-labeled **OSTEOSCAN-HDP** is rapidly cleared from blood and other non-osseous tissues and accumulates in the skeleton and urine. In humans, blood levels are about 10% of the injected dose at one hour post-injection and continue to fall to about 6%, 4% and 3% at 2, 3 and 4 hours respectively. When measured at 24 hours following its administration, skeletal retention is approximately 50% of the injected dose. **OSTEOSCAN-HDP** exhibits its greatest affinity for areas of altered osteogenesis and actively metabolizing bone.

INDICATIONS AND USAGE

OSTEOSCAN-HDP (Technetium Tc99m Oxidronate Kit) is a diagnostic skeletal imaging agent used to demonstrate areas of altered osteogenesis.

CONTRAINDICATIONS

None known.

WARNINGS

This class of compounds is known to complex cations such as calcium. Particular caution should be used with patients who have, or who may be predisposed to hypocalcemia (i.e., alkalosis).

PRECAUTIONS

General

Contents of the vial are intended only for use in the preparation of Technetium Tc99m Oxidronate and are **NOT** to be administered directly to the patient.

Technetium Tc99m Oxidronate should be formulated within **eight (8) hours** prior to clinical use. Optimal imaging results are obtained one to four hours after administration.

Technetium Tc99m Oxidronate as well as other radioactive drugs, must be handled with care, and appropriate safety measures should be used to minimize radiation exposure to the patients consistent with proper patient management.

Radiopharmaceuticals should be used only by physicians who are qualified by specific training 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.

To minimize radiation dose to the bladder, the patients should be encouraged to drink fluids and to void immediately before the examination and as often thereafter as possible for the next four to six hours.

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenic potential or whether Technetium Tc99m Oxidronate affects fertility in males and females.

Pregnancy—Category C

Animal reproduction studies have not been conducted with Technetium Tc99m Oxidronate. It is also not known whether Technetium Tc99m Oxidronate can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. Technetium Tc99m Oxidronate should be given to a pregnant woman only if clearly needed. Ideally, examinations using radiopharmaceuticals, especially those elective in nature, of a woman of childbearing capability should be performed during the first few (approximately 10) days following the onset of menses.

Nursing Mothers

Technetium Tc99m is excreted in human milk during lactation, therefore formula feedings should be substituted for breast feedings.

Pediatric Use

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

Although adverse reactions have not been reported that are specifically attributable to the use of Technetium Tc99m Oxidronate, allergic dermalological manifestations (erythema) have been infrequently reported with similar agents.

DOSAGE AND ADMINISTRATION

General Instructions

The recommended adult dose of Technetium Tc99m-labeled **OSTEOSCAN-HDP** is 15 mCi with a range of 10 to 20mCi. The activity of each dose should be measured by a suitable radiation calibration system just prior to administration. The dose should be given intravenously by slow injection. For optimal results imaging should be done 1-4 hours post-injection.

Radiation Dosimetry

The estimated absorbed radiation dose to an average patient (70 kg) from an intravenous injection of 20 millicuries of Technetium Tc99m-labeled **OSTEOSCAN-HDP** are shown in Table IV.

This reagent kit is approved for use by persons licensed by the U.S. Nuclear Regulatory Commission pursuant to Section 35.14 and 35.100 Group III of 10 CFR Part 35 or under equivalent licenses of Agreement States.

Table IV. Absorbed Radiation Doses*

Tissues	(rads/20mCi)
Total Body	0.13
Bone Total	0.70
Red Marrow	0.56
Kidneys	0.80
Liver	0.06
Bladder Wall	
2 hr void	2.60
4.8 hr void	6.20
Ovaries	
2 hr void	0.24
4.8 hr void	0.34
Testes	
2 hr void	0.16
4.8 hr void	0.22

*Method of calculation: "S" Absorbed Dose per Unit Cumulated Activity Selected Radionuclides and Organs, MIRD Pamphlet No. 1, 1975.

Preparations For Use

All procedures should be conducted using waterproof gloves. Use shielded syringe during transport and administration of Tc99m solutions.

1. Remove metal disc from **OSTEOSCAN-HDP** vial and cleanse top by swabbing with alcohol. Note: If dose for a single patient, see unit dose preparation method below.
2. Place vial in lead vial shield. Add 3-6 ml of sodium pertechnetate Tc99m solution and secure with a fitted lead cover. In choosing the amount of Tc99m radioactivity to be used, the number of doses desired, the activity of each dose (recommended adult dose is 15 mCi with a range of 10-20 mCi) and radioactive decay must be taken into account. **The recommended maximum amount of Tc99m radioactivity to be added to the vial is 200 mCi.**
   Note: The contents of the vial are now radioactive. Maintain adequate shielding using the lead vial shield and fitted lead cover during the life of the radioactive preparation.
3. Shake the vial for approximately 30 seconds to assure complete dissolution.
4. Record the time, date of preparation and the activity of the Tc99m-labeled **OSTEOSCAN-HDP** on the radiation label and affix this label to the shield.
5. Use within eight (8) hours of preparation. Refrigeration of the radiolabeled complex is not necessary. Discard excess material in accordance with Nuclear Regulatory Commission or agreement state regulations pertaining to the disposal of radioactive wastes.

For preparing a dose for a single patient, to minimize volume injected and to insure optimum solution concentration, reconstitute the vial contents in 3-6 ml of sterile saline. Shake the vial for approximately 30 seconds to assure complete dissolution; withdraw and discard all but approximately 1 ml of the solution. Add appropriate amount of sodium pertechnetate Tc99m and shake. Proceed with steps 4 and 5. Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration whenever solution and container permit.

HOW SUPPLIED

OSTEOSCAN-HDP is supplied as a lyophilized powder packaged in vials. Each vial contains 2.0 mg oxidronate sodium and 0.16 mg stannous chloride as active ingredients, and 0.56 mg gentisic acid as a stabilizer. Kits containing 5 vials (NDC 00019-N099-BO) or 30 vials (NDC 00019-N099-DO) are available. The drug can be stored at room temperature both prior to and following reconstitution with ADDITIVE-FREE sodium pertechnetate Tc99m.

Mallinckrodt

Diagnostic Products Division
Mallinckrodt, Inc.
Post Office Box 5840
St. Louis, MO 63134

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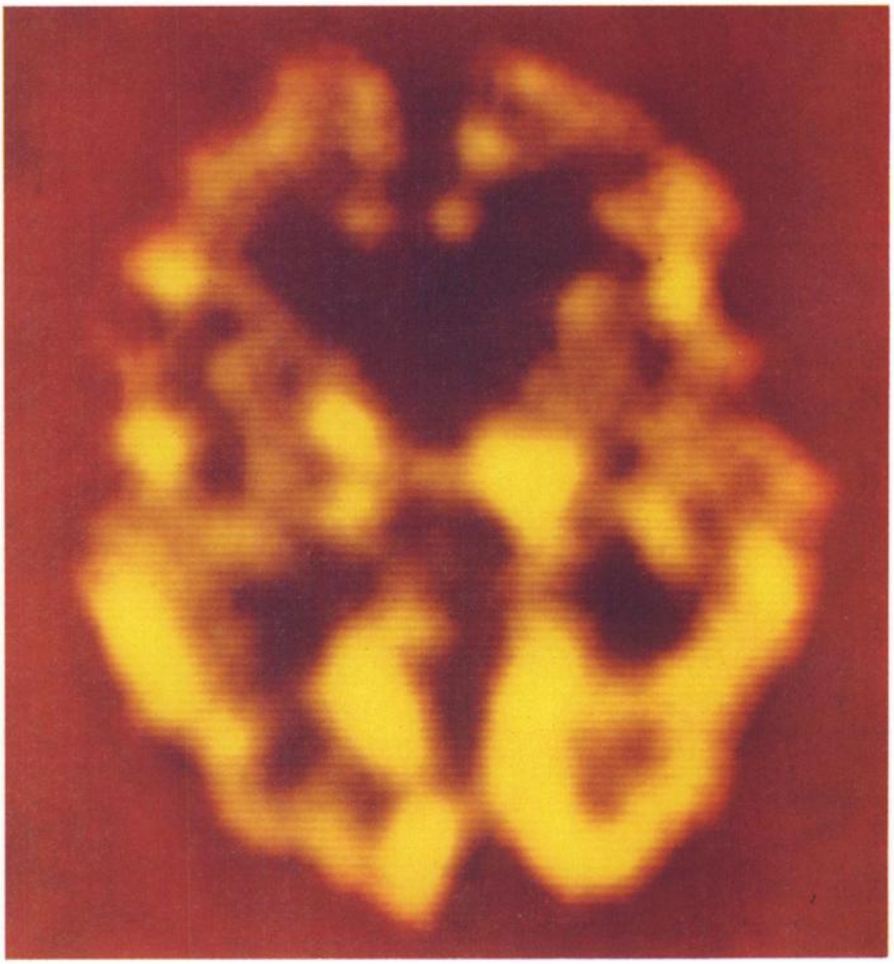
Manufactured for: Mallinckrodt, Inc., St. Louis, MO 63134 by Lypho-Med, Inc., Chicago, IL 60651

Novo SPECT Systems

Meet us at the Society of European Nuclear Medicine exhibition, Finland. Booth no. B17. August 14th–17th

Introducing the performance of PET at the cost of a rotating gamma camera

Early assessment of suspected neurologic disorders continues to pose important clinical challenges – challenges largely unmet by the restricted availability of positron-emission tomography (PET) and the acknowledge limitations of transmission computed tomography and SPECT as performed by rotating gamma-cameras. Noninvasive single-photon emission computed tomography (SPECT) can provide highly sensitive, early diagnostic information useful in the management of the hundreds of thousands of patients who each year develop central nervous system disease.



Novo enters SPECT

Novo's entry into SPECT imaging means that clinicians at most institutions will be able to routinely obtain data on cerebral function and metabolism thus far only possible with PET imaging – but without the high costs and procedural difficulties associated with PET. Utilizing newly available iodine-123 monoamine tracers that cross the blood-brain barrier and are taken up by brain tissue, Novo SPECT can acquire multiple sequential high sensitivity and high resolution tomographic images of regional brain perfusion.

Proven applications

Already, many studies have documented the advantages of SPECT brain imaging in a number of clinical settings:

In stroke: SPECT imaging may have its greatest utility in the early demonstration of regional ischemia or hyperemia, and the distinction between ischemic and infarcted tissue, for which conventional brain imaging and CT are often inadequate.

In tumor localization: Tumors can be accurately located in three dimensions as areas of increased or decreased uptake.

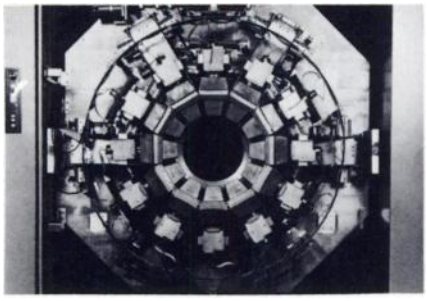
In epilepsy: Quantitative SPECT studies demonstrate epileptogenic foci as areas of increased uptake. SPECT imaging permits localization of even deep foci inaccessible to EEG.

In therapeutic monitoring: SPECT imaging enables clinicians to assess normalization following medical or surgical therapy.

Novo SPECT System

A sophisticated, dedicated multidetector diagnostic instrument for brain imaging, with high sensitivity and excellent spatial resolution.

For further information please contact:



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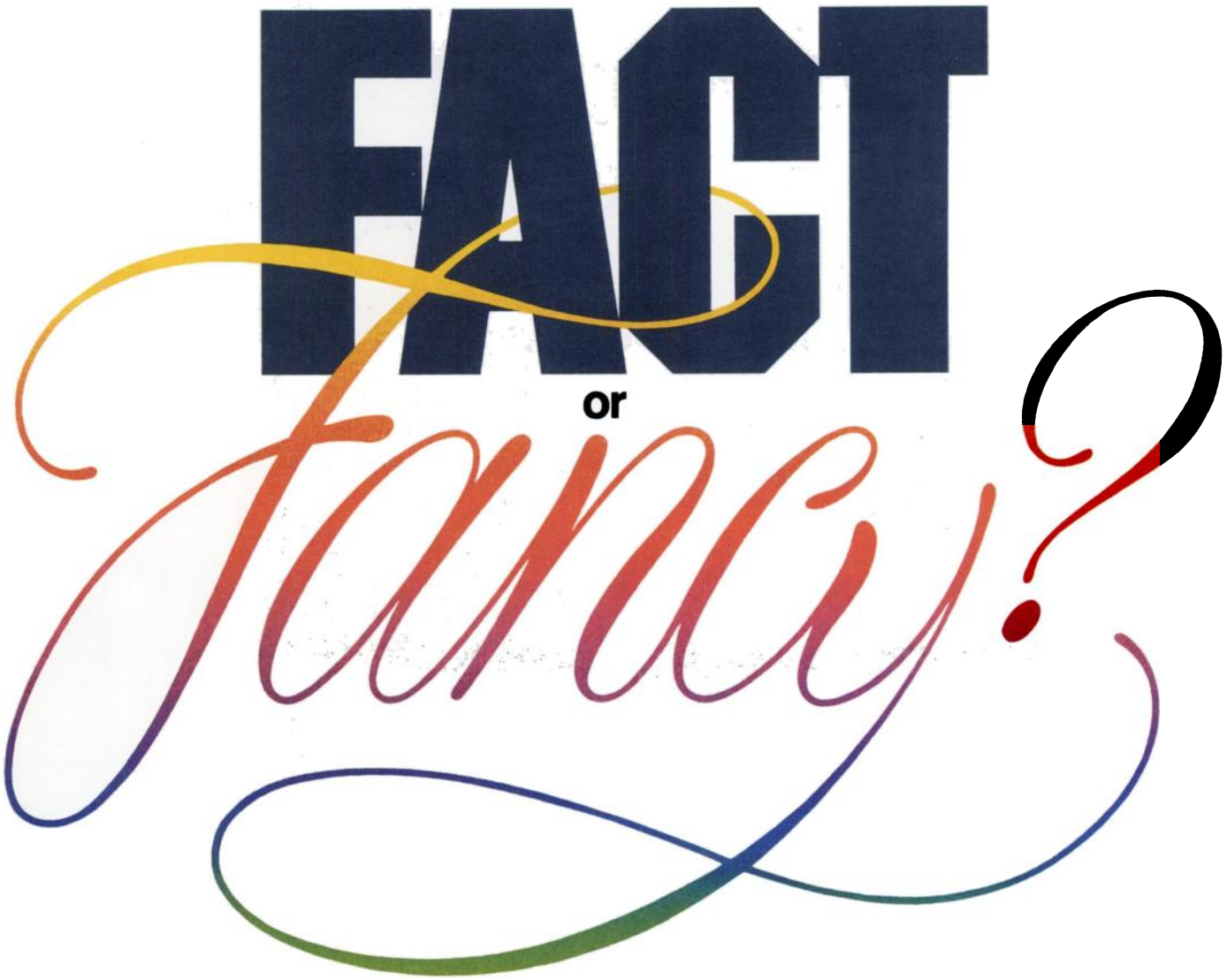
NOVO

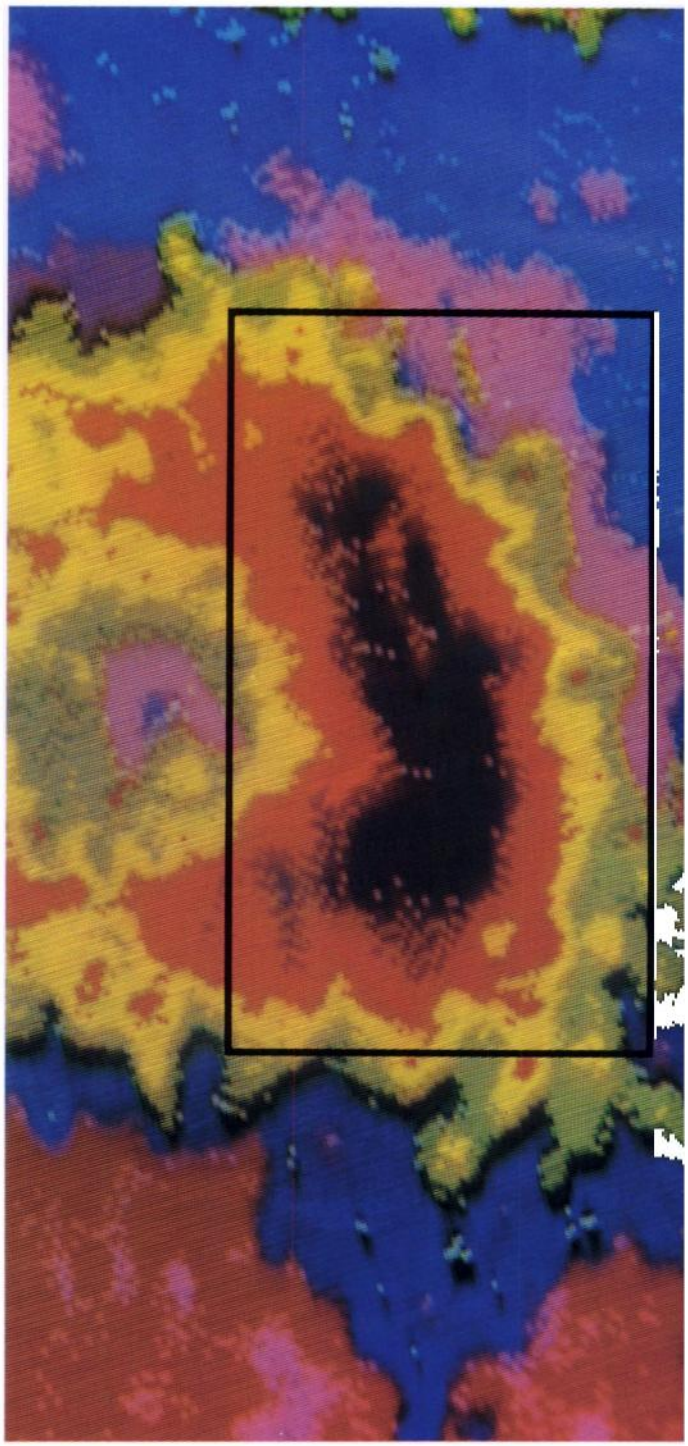
SIEMENS

Are your
diagnostic images



SIEMENS

Why accept "cosmetically" manipulated images?

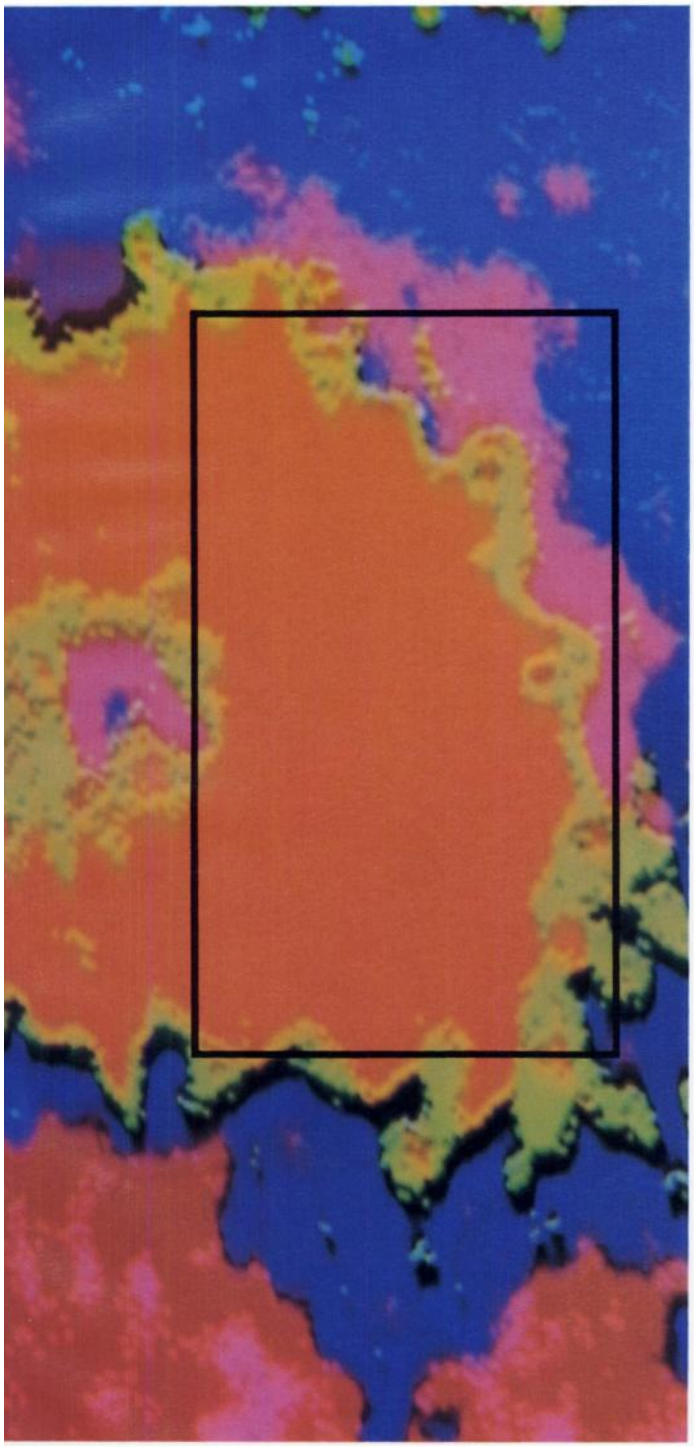


A diagnostic image should tell you the truth.
Next time you're reading the specifications on a nuclear imaging system, watch for words like "compensated," "selected," or "operator calibrated."

These words may be telling you that what you get may *not* be what you're looking for.

Siemens Nuclear Imaging Systems tell you the truth...
Some years ago, Siemens introduced ZLC™, the innovative energy and linearity distortion removal system. ZLC corrects intrinsic energy variations and spatial non-linearities–the major causes of non-uniformities in gamma cameras.

...the whole truth...
DIGITRAC™, the newest innovation in Siemens Camera Systems, is a microprocessor controlled PMT gain adjustment circuit incorporated in the detector. DIGITRAC automatically adjusts individual PMT gain (or drift) so that gamma ray photopeaks are precisely aligned throughout the camera field of view. Using nuclear radiation as the primary standard, the camera is recursively calibrated for the isotope being imaged.



...and nothing but the truth.

Siemens cameras with ZLC™ and DIGITRAC offer energy correction, linearity correction and recursive calibration without count skimming, count adding, or other "cosmetic" manipulations of the display.

DIGITRAC™

New technology that makes everything else something less than "state of the art"

ZLC with DIGITRAC is the step forward that makes all previous camera technology obsolete. Here's what ZLC with DIGITRAC offers:

- Improved image quality by precise photopeak "windowing"–allowing increased target to background ratio
- Exclusive system diagnostics to increase patient throughput and to allow maintenance of maximum system performance
- The ability to schedule service when it's convenient...because you always know the status of your PMT's
- Minimal system downtime
- Reliable quality control information
- Consistent system performance–month after month, year after year

Note: Images shown are enhanced for graphic presentation only.

ZLC™ with DIGITRAC™ is available in your choice of imaging systems: planar, whole body, cardiac or SPECT.

Siemens Counterbalance Systems
These systems offer all the flexibility you need for SPECT, whole body and planar imaging... without the need for additional space.

ZLC 7500S SPECT System with DIGITRAC
- ZLC 7500S offers ¼" or ⅜" crystal for optimum sensitivity or resolution
- Convenient push-button setup– reduces scatter and improves image quality
- Patented counterbalance stand with simplified controls and unique pivoting base for easier patient setup
- New powered SPECT table facilitates body contour tracking
- SPECT processor with dual isotope imaging capability allows automatic body contour mapping for attenuation correction
- ECT color monitor available as an option

Siemens ZLC 3700 System with whole body table
- ZLC 3700 camera with ⅜" crystal and DIGITRAC
- New sophisticated electronics substantially increases throughput in whole body scanning
- Digital Operator's Terminal allows push-button setup of study parameters
- Compatible with your computer

Siemens Mobile Systems
Low-cost, efficient mobile systems to meet the imaging needs of your referring specialists... including pediatricians, cardiologists, endocrinologists, joint disease specialists and others.

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- Unique power drive for easier maneuverability
- ZLC with DIGITRAC for image integrity

Siemens ROTA System
The ROTA Camera is uniquely designed to offer field upgrading. Choose a dual detector system now or a single detector system for upgrading later.
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- Higher sensitivity and better image resolution in SPECT
- Digital readout for more definitive detector location

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(201) 321-4500

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Siemens ROTA System

Siemens Counterbalance Systems

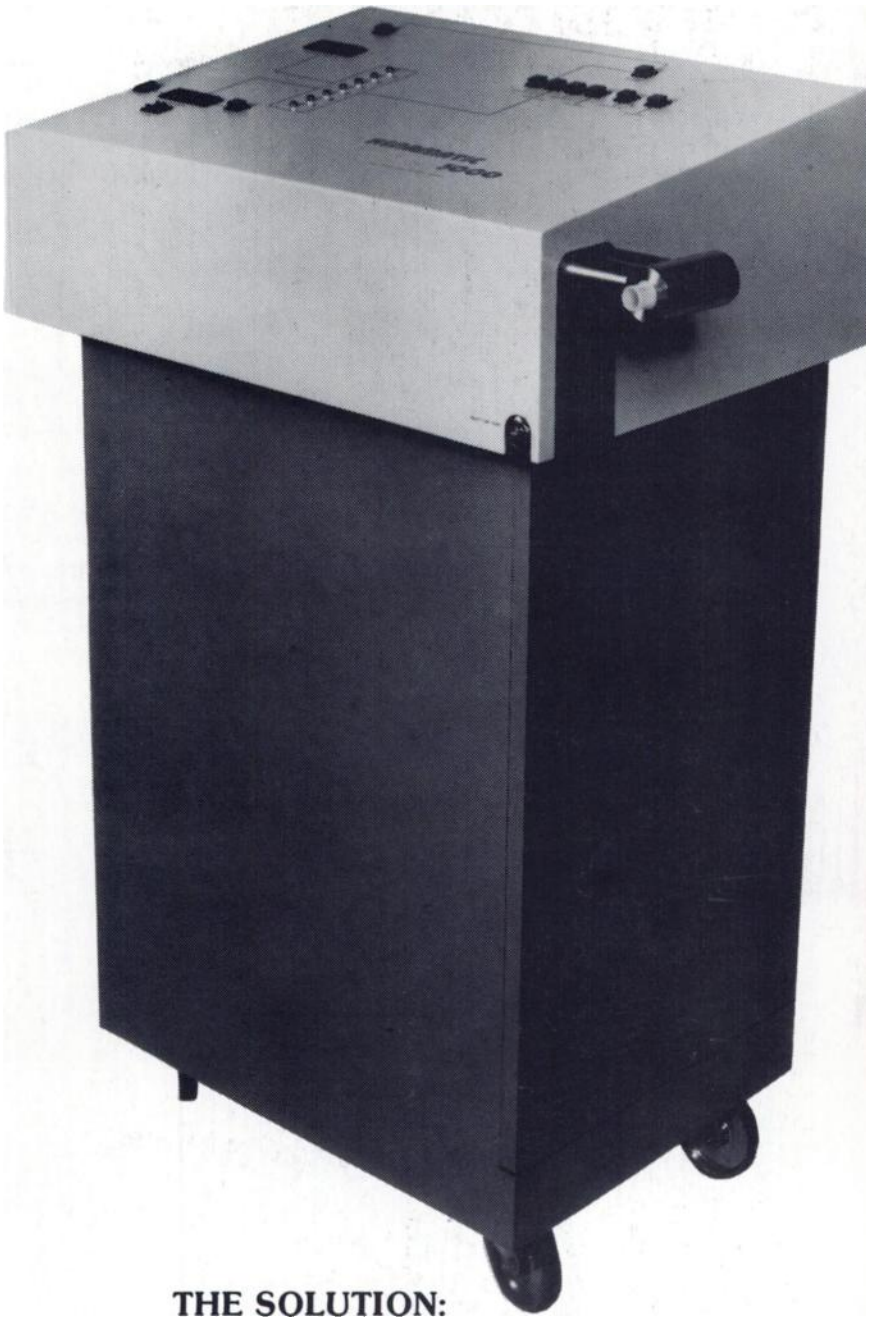
Siemens Nuclear Imaging Systems are quality systems... designed and manufactured to provide you with the most accurate diagnostic information obtainable.

Siemens is committed to advancing the state of the art of nuclear imaging through responsible innovation, user-oriented design and dedicated, knowledgeable service.

Siemens Mobile Systems

Siemens... technology with integrity

XE 127 + XENAMATIC™ = THE SOLUTION



THE PROBLEM:
You would like to do the lung perfusion images first, look at the images and decide if a ventilation study is called for.

THE SOLUTION:
Xenon 127. Its higher energies allow effective elimination of Tc 99m gammas from subsequent ventilation images.

THE PROBLEM:
The short half-life of Xenon 133 makes availability a problem, increases shipping costs, and we lose much of it through decay.

THE SOLUTION:
Xenon 127. Its 36 day half-life eliminates the inherent problems of short lived Xenon 133.

THE PROBLEM:
Xenon delivery systems currently being offered are not sufficiently shielded for Xenon 127.

THE SOLUTION:
The XENAMATIC Xenon Gas Delivery System with the optional Xenon 127 lead shielding. Additional lead is provided throughout the unit. In strategic locations we provide up to 1/2 inch of lead. Our goal: to achieve a radiation level of less than 2 mr/hr at the surface under normal use conditions.

THE PROBLEM:
Xenon Traps are really delay systems. If it delays the Xenon long enough for it to decay, then it approaches a trap in function. With Xenon 127, activated charcoal traps either must be significantly larger than previously available traps or they must be refrigerated.

THE SOLUTION:
The XENAMATIC. Our Xenon Trap Cartridge Pack offers 20 feet of continuous activated charcoal pathway (3" in diameter) via nine individual tubes connected in series. Additionally, the individual tubes are specially constructed to inhibit the normal redistribution of "trapped" Xenon which occurs even when the trap is not being used.

THE XENAMATIC™ IS THE ONLY ANSWER!

For more information, call or write today:

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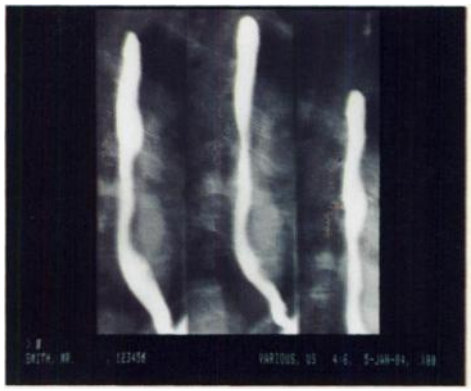
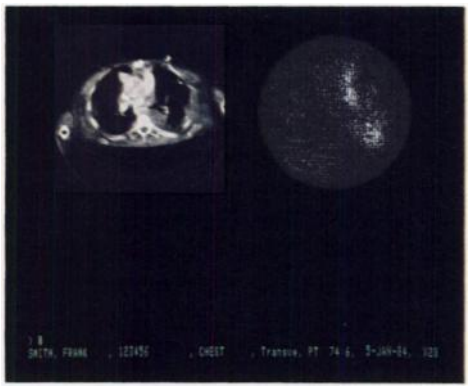
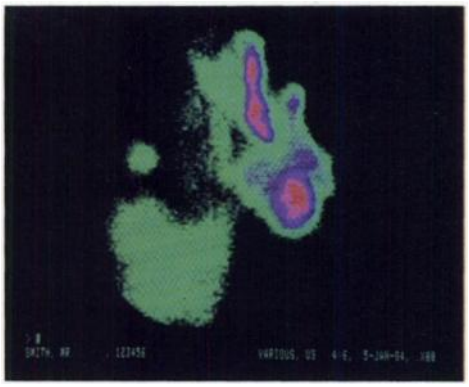


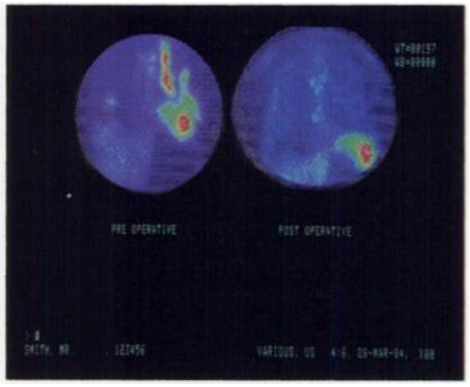
X ray Shows Abnormal Fluid Collection Between the Esophagus and the Aorta



CT—Abscess Obscured by Surgical Clips Comparative SPECT Clarifies Abscess Position



Pre-op Nuclear Scan—Indium 111 Labelled White Cells Further Pinpoint Infected Area to Esophagus and Soft Tissue. Aorta Not Involved.



Pre- and Post-op Indium Scan Comparison— Shows Abscess Drained and Treated

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Images courtesy of Jason S. Zielonka, M.D.; Chief, Nuclear Medicine Services; V.A. Medical Center; Wood, WI.

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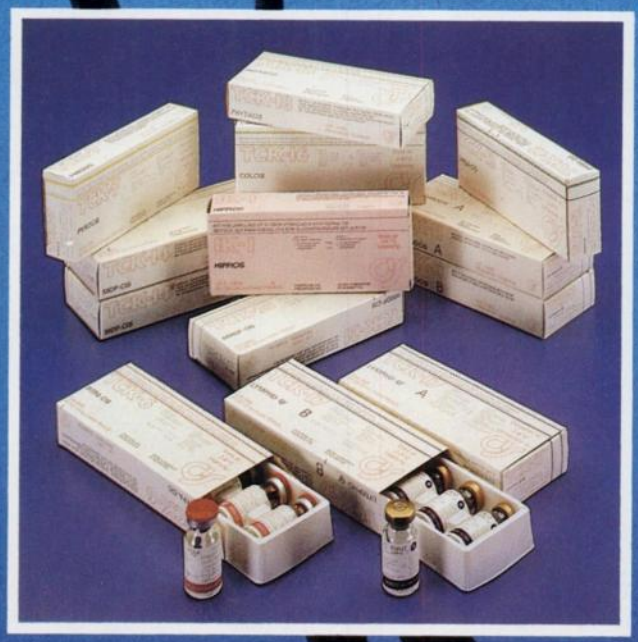

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VENTICIS AEROSOL SYSTEM

- Safe, compact, ready-for-use, single use radioaerosol delivery system.
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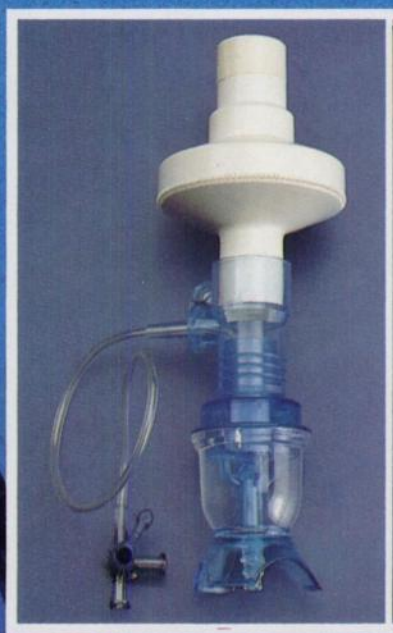

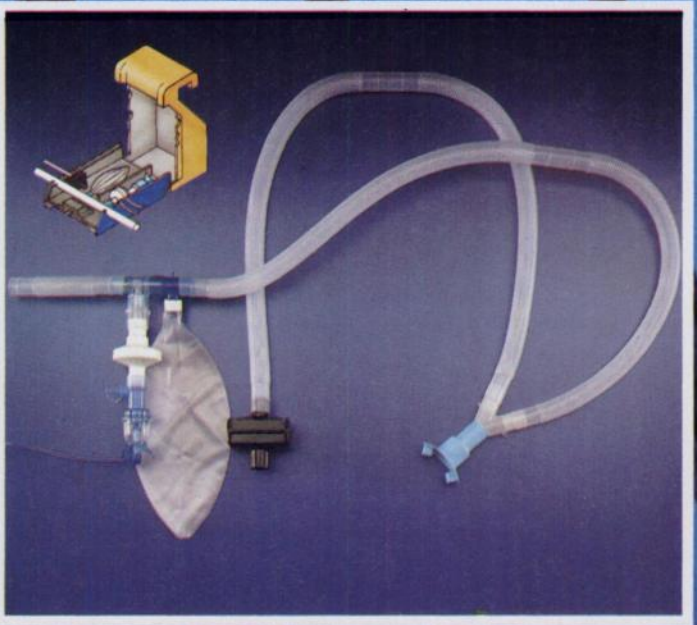

* *Optimist* : trade mark of MEDICAID (England)

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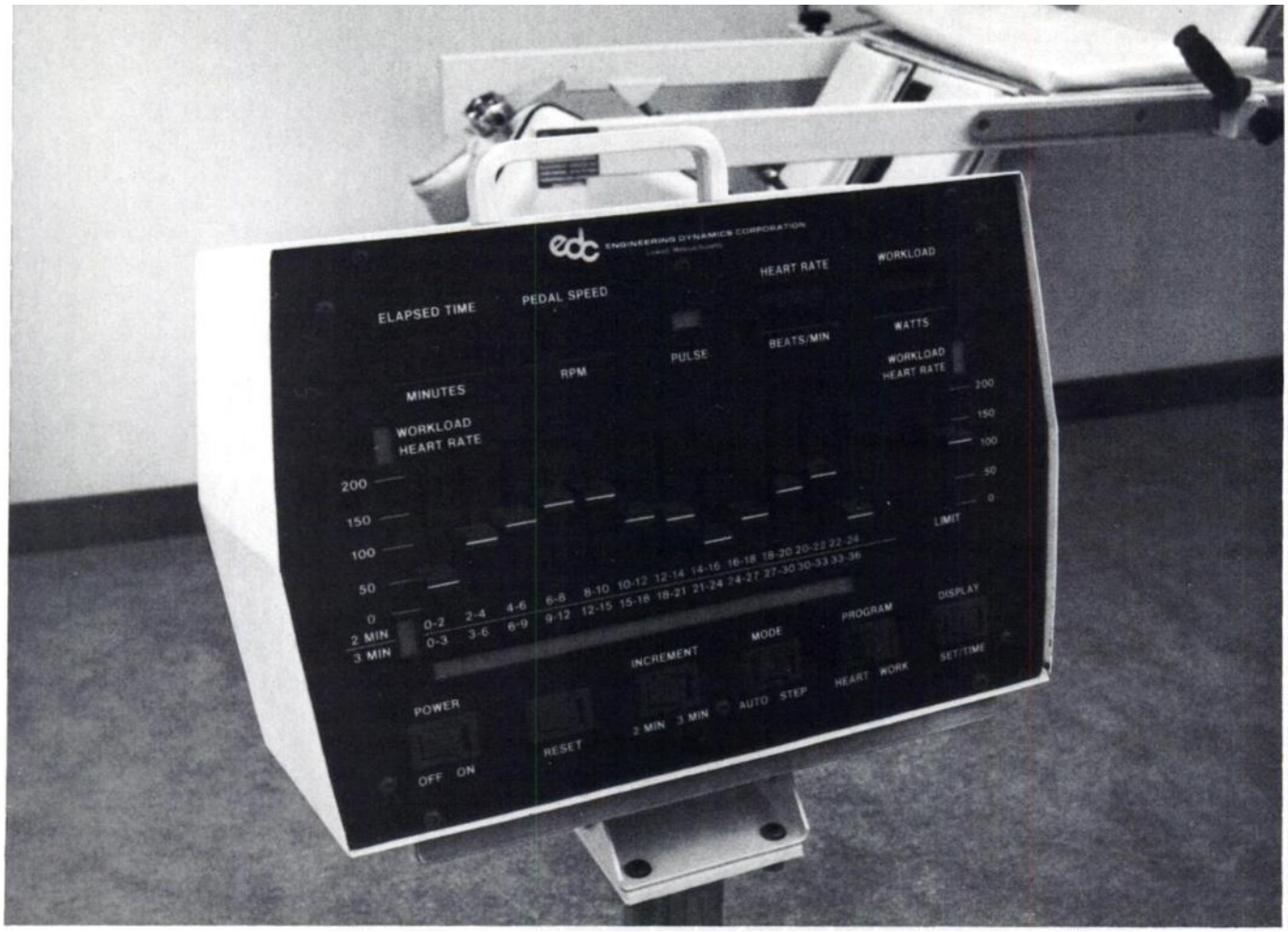

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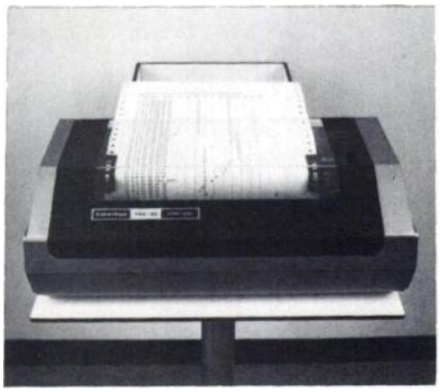
Introducing the most advanced cardiac stress system — the EDC Model 8450. Now you can program any protocol in seconds — either workload or heart rate — right at the front panel by a mere touch of the programmer.



Our powerful microprocessor insures the highest accuracy of any stress system — and as an option, you can have a permanent printed record of the entire stress test, with digital readings of elapsed time, workload, and heart rate every six seconds — and with the integrated workload (in KPM) at the end of each program segment.

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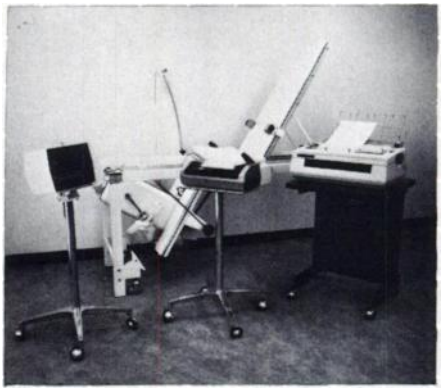
We think the EDC Model 8450 has everything you will ever want, or need, for Cardiac Stress Testing. Give us a call for further details.



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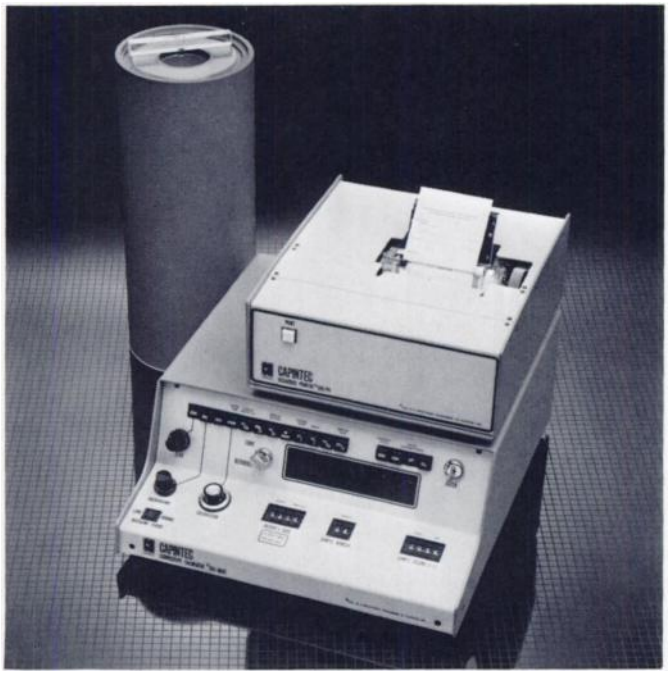

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The CRC-30BC is specifically designed to provide the ultimate in:

Computation:	To insure accurate dosage, assuring the activity is precisely as prescribed.
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When you need a high quality radioimmunoassay measurement and data handling system count on Cap-Ria™ 16.

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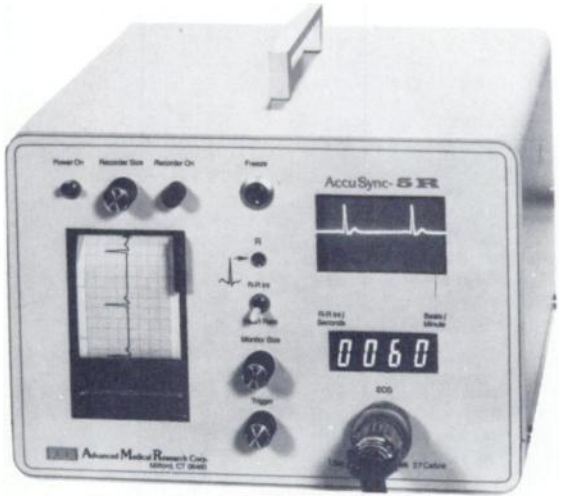

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NUCLEAR MEDICINE PHYSICIAN. Experienced Nuclear Medicine Pysician in expanding progressive private in vivo and in vitro NM outpatient laboratory. Applicant should be board certified by ABNM or board eligible in Nuclear Medicine with preferably two years internal medicine residency training. Medical school association or affiliation possible if desired. Please send resume to: Box 801, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

NUCLEAR MEDICINE PHYSICIAN position available at the assistant/associate professor level at the 1500-bed Los Angeles County-University of Southern California Medical Center. Experience in research and teaching is required. The equipment is state-of-the-art and there are strong working relationships with several departments, especially oncology and cardiology. Radiopharmaceutical development is available through the Department of Radiopharmacy. Please send resume to: Michael E. Siegel, MD, Division of Nuclear Medicine, LAC-USC Medical Center, 1200 N. State St., Los Angeles, CA 90033, Box 693. Equal Opportunity Employer.

NUCLEAR MEDICINE PHYSICIAN. Staff position available in the Section of Nuclear Medicine, Health Sciences Centre. This hospital is a tertiary care center performing a full range of imaging and non-imaging studies. Applicants should be certified by the Royal College of Physicians and Surgeons of Canada or eligible to sit the Certification Examinations. Opportunities for research and academic title are available. This position is open to both men and women. Canadian citizens, landed imigrants, and others eligible for employment in Canada at the time of application are especially encouraged to apply. Send resume or call: Dr. I. David Greenberg, Section of Nuclear Medicine, Health Sciences Centre, 700 William Avenue, Winnipeg, Manitoba, Canada R3E 0Z3; (204)787-3375.

NUCLEAR MEDICINE TECHNOLOGIST. Central Maine Medical Center, a 240-bed, acute care facility, has a regular part-time opening with benefits for a Nuclear Medicine Technologist. Qualifications include Registered or Registry eligible by APRT or NMTCB with nuclear cardiology and computer experience preferred. The position also includes call coverage. Our Nuclear Medicine Department is a progressive department and offers growth and opportunity. For further information, contact: Central Maine Medical Center, Personnel Department, 300 Main Street, Lewiston, Maine 04240; (207)795-2392. Equal Opportunity Employer.

NUCLEAR MEDICINE TECHNOLOGIST. Position now available for an experienced Nuclear Medicine Technologist certified by SNM or registered technologist in a private progressive outpatient nuclear medicine laboratory in a large city in a large medical center in the Sun Belt. Knowledge of radioimmunoassay, imaging, computer, and nuclear cardiology in addition to supervisory, administrative, and teaching experience required. Please send resume to: Box 800, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

NUCLEAR MEDICINE TECHNOLOGIST. St. Luke's Regional Medical Center, a 338-bed critical care facility, in Sioux City, Iowa is seeking a Nuclear Medicine Technologist with a strong background in cardiology. Must be registered or eligible. For additional information for employment opportunities contact: Department of Human Resources, St. Luke's Regional Medical Center, 2720 Stone Park Boulevard, Sioux City, IA 51104; (712)279-3123.

NUCLEAR MEDICINE TECHNOLOGIST. The Veterans Administration Medical Center, Danville, Illinois is recruiting for a Nuclear Medicine Technologist. Performs a full range of nuclear medicine duties including nuclear cardiology. The VA Medical Center, Danville, is affiliated with the University of Illinois School of Medicine. The Medical Center is 30 miles east of Champaign-Urbana, 150 miles south of Chicago, and 86 miles west of Indianapolis, Indiana. Excellent fringe benefits include annual and sick leave, health and life insurance and retirement. Salary range $20,965 to $27,256. Contact Richard Wheeler, Personnel Office, VA Medical Center, Danville, IL 61832. Tel: (217)442-8000, ext. 236. Equal Opportunity Employer.

RADIOLOGIST for private group in Texas. Nuclear medicine and catscan experience necessary. Send resume: Medical Technology Systems, 1101 Post Oak Blvd., Suite 9, Houston, TX 77056.

SUPERVISOR, NUCLEAR MEDICINE. Excellent oportunity available for registered Nuclear Medicine Technologist with supervisory experience. Pleasant working conditions in progressive 170-bed general hospital with two cameras plus rectolinear scanner, M.D.S. A^2 and G.E. Computers. Special competence in nuclear cardiology desirable. Must be computer experienced. Competitive salary and fringe benefits. Catholic Hospital in town of 75,000 located in sunny southwest Texas. Excellent hunting, fishing, water sports. University town with commercial air travel, five golf courses, and numerous tennis facilities. Submit resume and salary requirements to: W.T. Gordon, MD, Chief, Department of Radiology and Nuclear Medicine, St. John's Hospital, P.O. Drawer 5741, San Angelo, TX 76902-5741.

POSITIONS WANTED

NUCLEAR PHYSICIAN available, ABNM, internal medicine background, with special competence in cardiology, GI, computer programming. Academic/Private position. Reply Box 802, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

The University of Nevada, Las Vegas, Department of Radiological Sciences is seeking a full-time Nuclear Medicine Educational Coordinator. The position will begin the last week of August, 1984, and involves planning and administration of the CAHEA approved nuclear medicine program. The position also requires some teaching responsibilities. Qualifications include: Master's degree (Doctorate preferred) in related area; registry in nuclear medicine awarded by the American Registry of Radiologic Technologists or Nuclear Medicine Technologist Certification Board or a certificate/licensure from an approved agency (a second registry in radiography is preferred); a minimum of 2 years of clinical experience; and 2 years of teaching at the collegiate level.

Salary commensurate with qualifications. Applications will be accepted until the position is filled.

Send curriculum vitae to: Department of Radiological Sciences, University of Nevada, Las Vegas, 4505 Maryland Parkway, Las Vegas NV 89154, ATTN: Chairperson.

The University of Nevada Las Vegas is an Equal Opportunity/Affirmative Action Employer, M/F

ASSISTANT CHAIRMAN/PROGRAM DIRECTOR
RADIATION/NUCLEAR MEDICINE

Assistant to the Chairman of Medical and Health Sciences Division in providing management and scientific guidance in Radiation and Nuclear Medicine Programs. Requirements: MD experience (8–10 years) in nuclear medicine and radiation medicine/biology as well as medical program management experiences. Send resume and salary history and requirements to:

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UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
SCHOOL OF MEDICINE

A nuclear medicine resident position is available beginning July 1, 1985 for a 2-year program at San Francisco General Hospital Medical Center.

The program, approved by the ACGME and satisfying the requirements of the American Board of Nuclear Medicine, includes didactic instruction in radiological physics and mathematics, electronics, radiation safety, dosimetry, and nuclear medicine instrumentation.

Practical experience is provided in performance and interpretation of static and dynamic imaging, computer techniques, radioimmunoassay and other in vitro tests, radiopharmacy, and therapy with radionuclides. Residents participate fully in the integration of these modalities into patient care.

Prerequisite: Prior training in an ACGME-approved program in internal medicine, pathology, pediatrics, or radiology.

The University of California is an Equal Opportunity, Affirmative Action Employer.

Requests for further information (include CV) should be directed to:

Myron Pollycove, M.D.
Chief, Nuclear Medicine Department
San Francisco General Hospital Medical Center
San Francisco, CA 94110

SOUTH SASKATCHEWAN HOSPITAL CENTRE
REGINA, SASKATCHEWAN, CANADA
REQUIRES A:
NUCLEAR MEDICINE PHYSICIAN

Applications are invited for the position of a full-time Nuclear Physician to work in the South Saskatchewan Hospital Centre group of hospitals in Regina, Saskatchewan. The Plains Health Centre is a 300-bed teaching hospital of the University of Saskatchewan that has medical and surgical specialities and has been designated as the cardioscience and neuroscience hospital for southern Saskatchewan. The Pasqua Hospital is a 400-bed acute care hospital which is affiliated with the University of Saskatchewan and provides a broad spectrum of medical and surgical services and serves as the cancer treatment center for the southern half of the province of Saskatchewan.

Applicants must possess or be eligible to sit for the certification in nuclear medicine of the Royal College of Physicians and Surgeons of Canada. The successful applicant will be offered competitive remuneration and a teaching appointment at an appropriate rank at the University of Saskatchewan.

Please address reply to:

Dr. M.H. Malik F.R.C.P. (C), Director of Nuclear Medicine,
Pasqua Hospital, 4101 Dewdney Ave.,
Regina, Saskatchewan, Canada S4T 1A5
(306)359-2360

South Saskatchewan Hospital Centre

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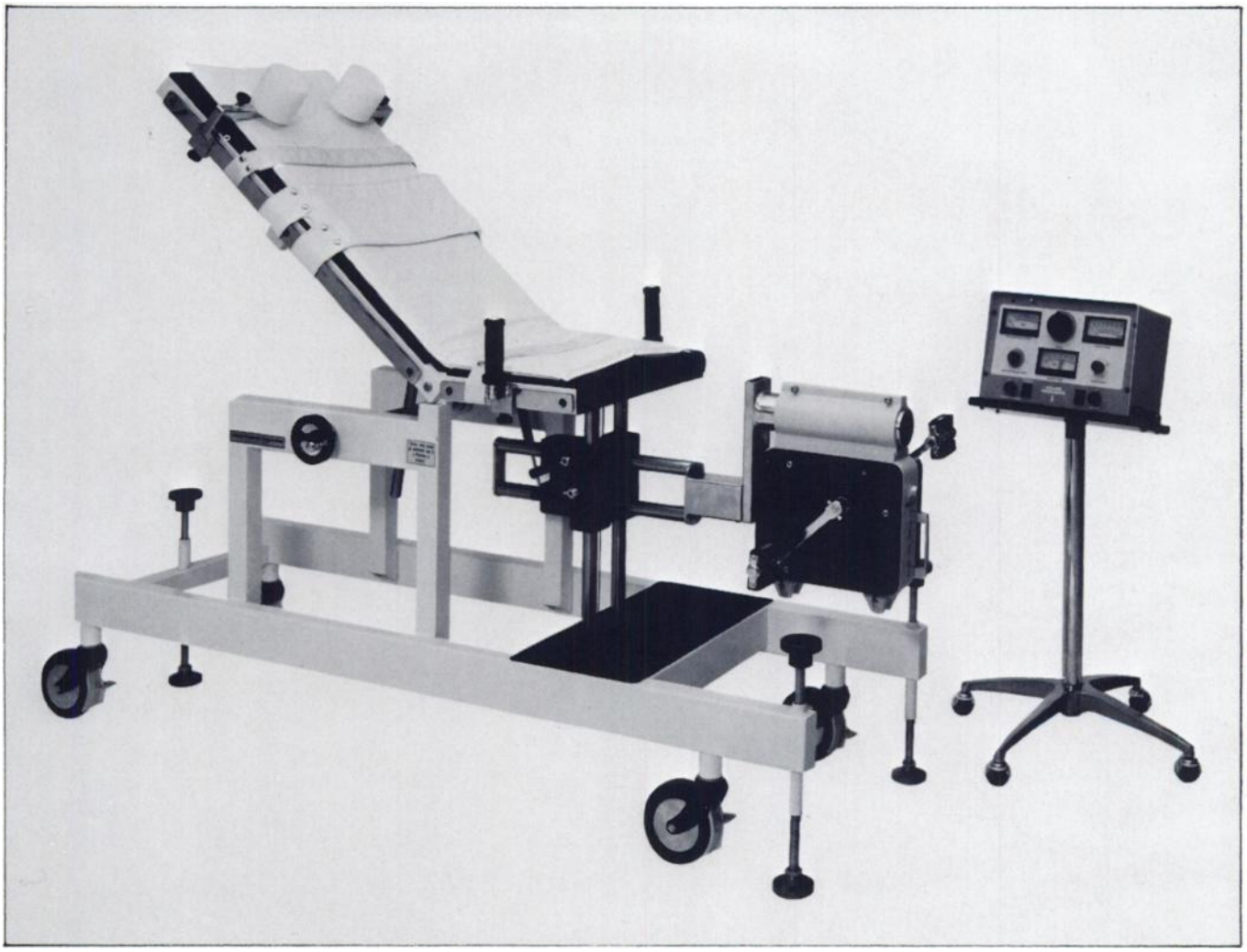

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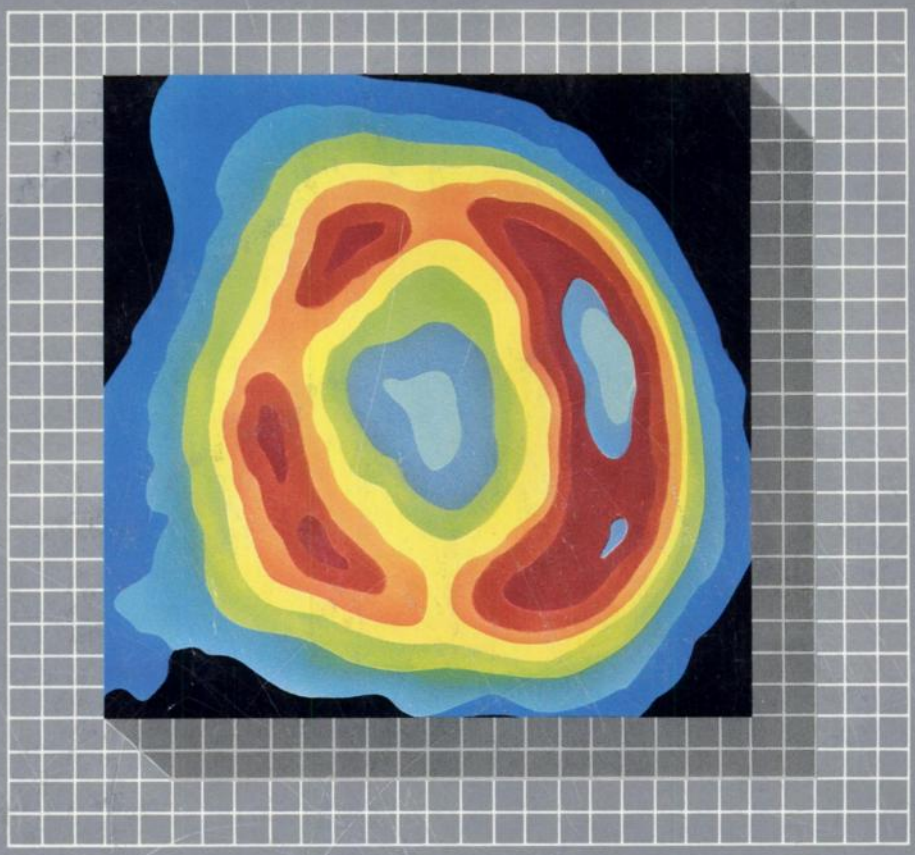
Thallous Chloride Tl 201



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*Activity at calibration time: 2.0 mCi at 10 p.m. Pacific Time.
You receive 2.8 mCi per vial at noon of day preceding calibration.

Thallous Chloride Tl 201
For complete prescribing information consult package insert, a brief summary of which follows:

DESCRIPTION: Thallous Chloride Tl 201 is supplied in isotonic solution as a sterile, nonpyrogenic diagnostic radiopharmaceutical for intravenous administration. Each unit dose contains 1 milliliter and each milliliter contains 2 millicuries of Thallous Chloride Tl 201 at calibration time. pH adjusted to 5.0–8.0 with hydrochloric acid and/or sodium hydroxide. Contains no bacteriostatic preservative. Thallium Tl 201 is cyclotron produced and is essentially carrier-free. Radionuclidic purity at calibration time is at least 98.0% with less than 1.0% Thallium Tl 200,1.0% Thallium 202 and 0.2% Lead Pb 203. The concentration of each radionuclidic contaminant changes with time.

INDICATION AND USAGE: Thallous Chloride Tl 201 may be used in cardiac imaging to define the extent of myocardial infarction.

It may also be useful in conjunction with exercise stress testing as an adjunct in the diagnosis of ischemic heart disease (atherosclerotic coronary artery disease).

CONTRAINDICATIONS: None known.

WARNINGS: When studying patients suspected or known to have myocardial infarction or ischemia, care should be taken to assure continuous clinical monitoring and treatment in accordance with safe, accepted procedure. Exercise stress testing should be performed only under the supervision of a qualified physician and in a laboratory equipped with appropriate resuscitation and support apparatus.

PRECAUTIONS

General

Do not use after the expiration time and date (4 days after calibration time) stated on the label.

Discard vial after single use. Do not use if contents are turbid.

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

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

Thallous Chloride Tl 201 as well as other radioactive drugs must be handled with care, and appropriate safety measures should be used to minimize radiation exposure to clinical personnel. Also, care should 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.

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenic potential, mutagenicity potential, or whether Thallous Chloride Tl 201 affects fertility in males or females.

Pregnancy Category C

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

Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Thallous Chloride Tl 201 is administered to a nursing woman.

Pediatric Use

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS: Adverse reactions related to use of this agent have not been reported to date.

HOW SUPPLIED: Thallous Chloride Tl 201 is supplied as a sterile, nonpyrogenic, isotonic solution in unit dose vials containing 1 milliliter. Each milliliter contains 2 millicuries of Thallous Chloride Tl 201 at calibration time. Contains no bacteriostatic preservative.

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