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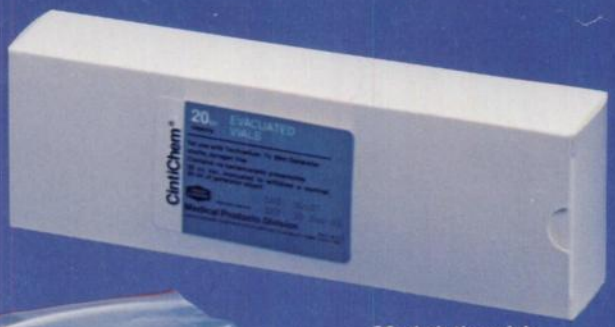
Technetium Tc 99m Generator

Secondary shield to further reduce radiation

5cc and 10cc elution vials



20ml elution vials available on request

Elution vial shield

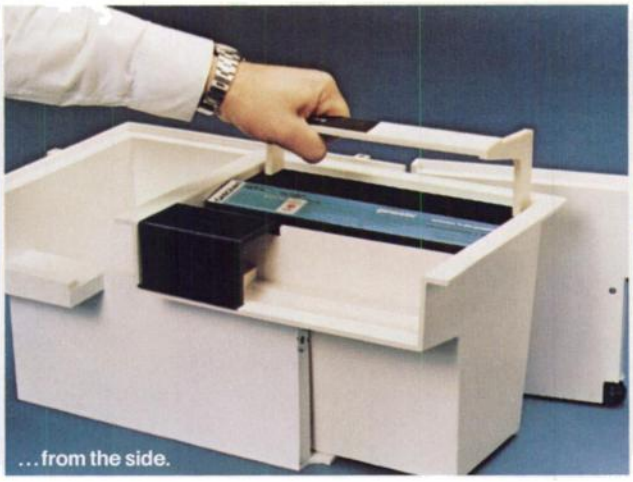
Adaptors for various elution vials

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

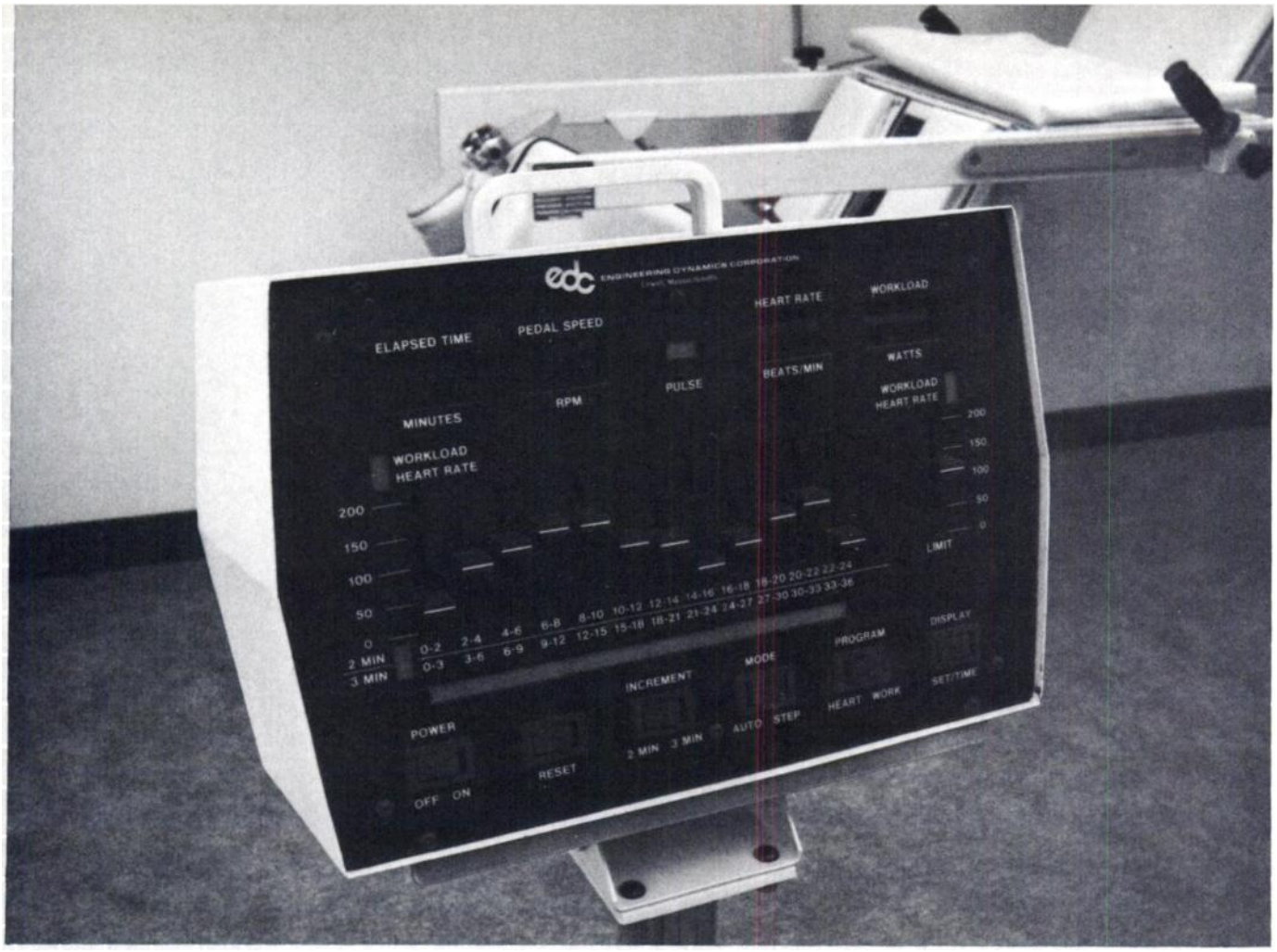
The TECHNETIUM Tc 99m GENERATOR should not be used after sixteen (16) days from the date and time of calibration.

Jointly manufactured by:
CINTICHEM, INC.
Tuxedo, N.Y. 10987

and

UNION CARBIDE CORPORATION
Tuxedo, N.Y. 10987

June, 1983



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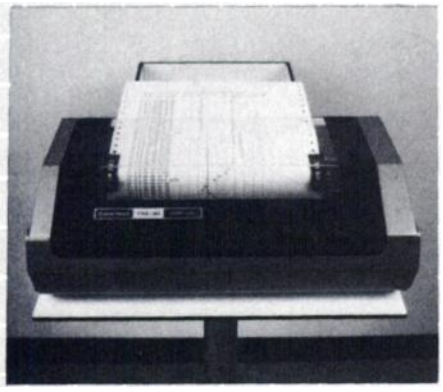

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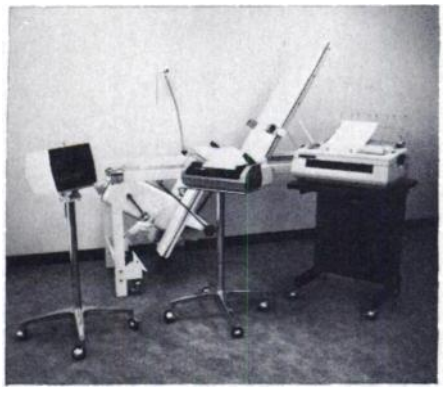

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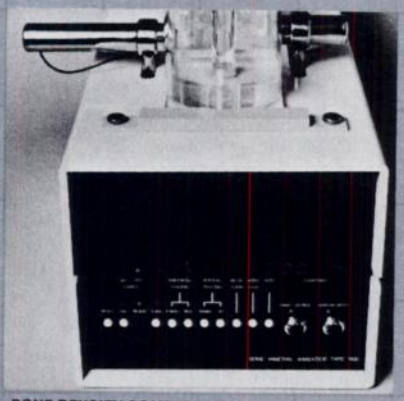

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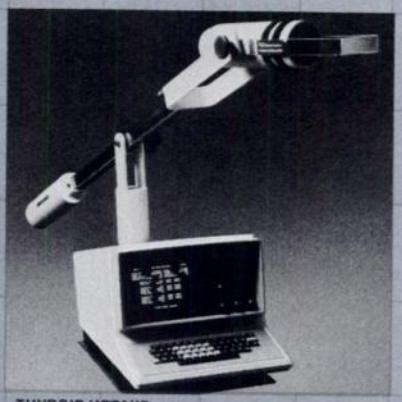

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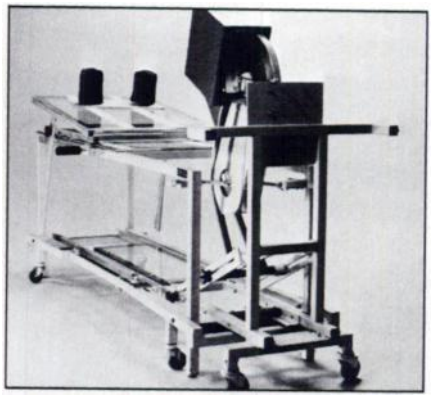

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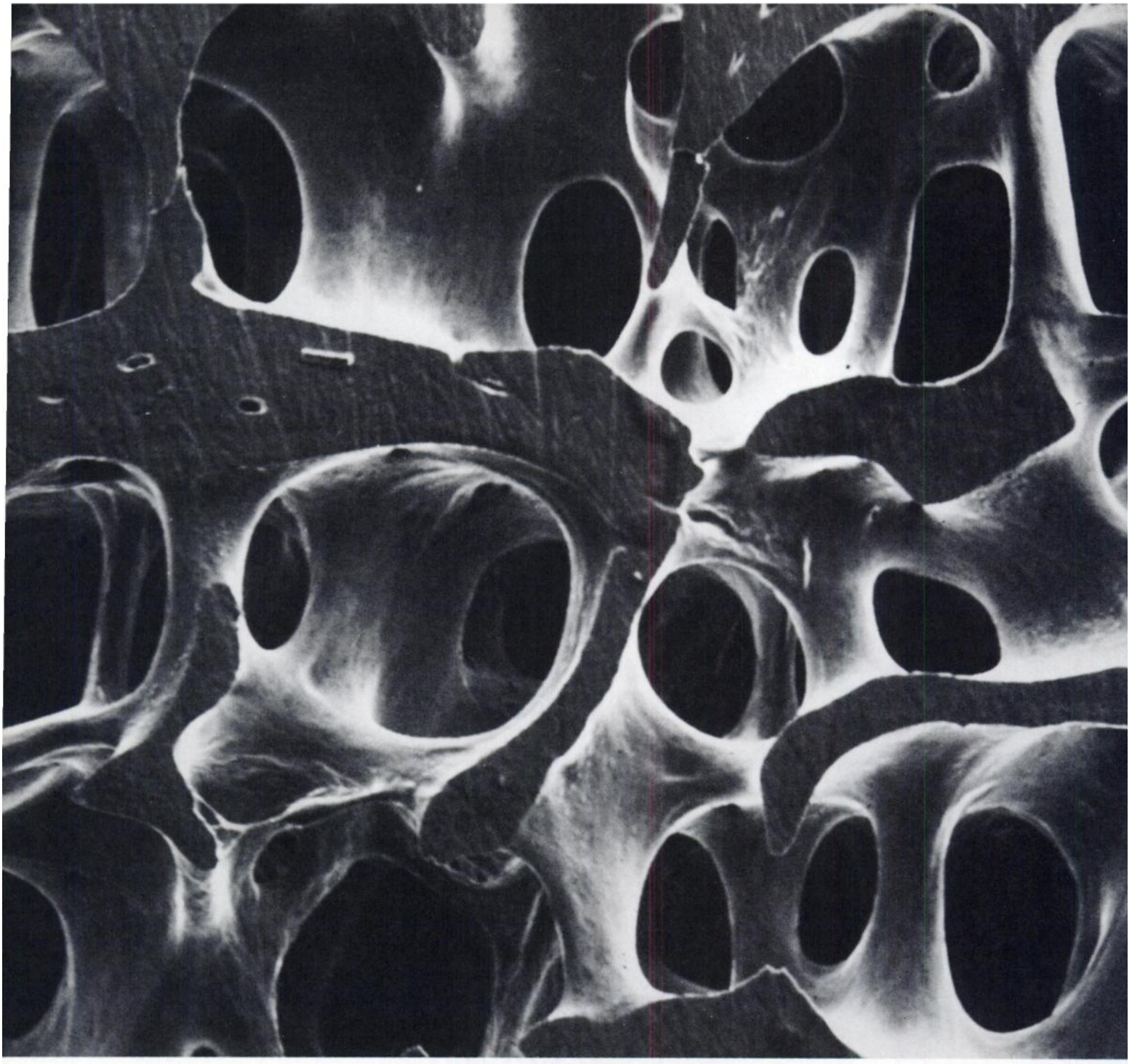

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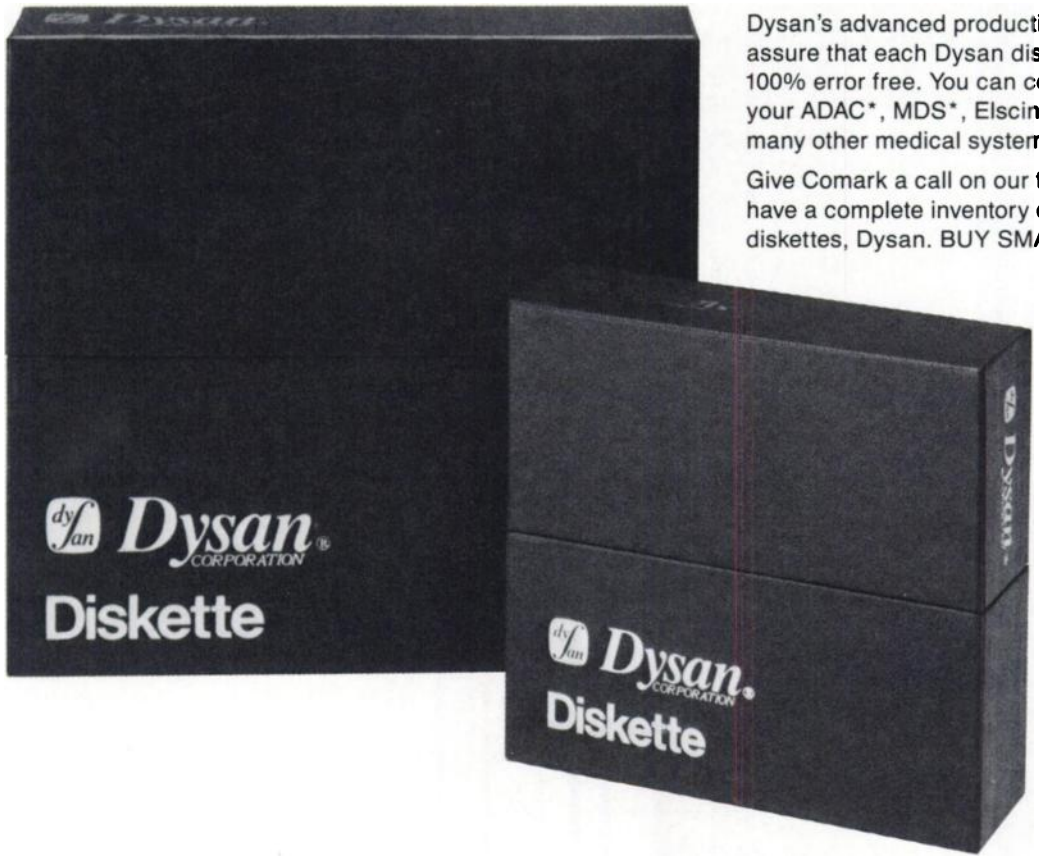

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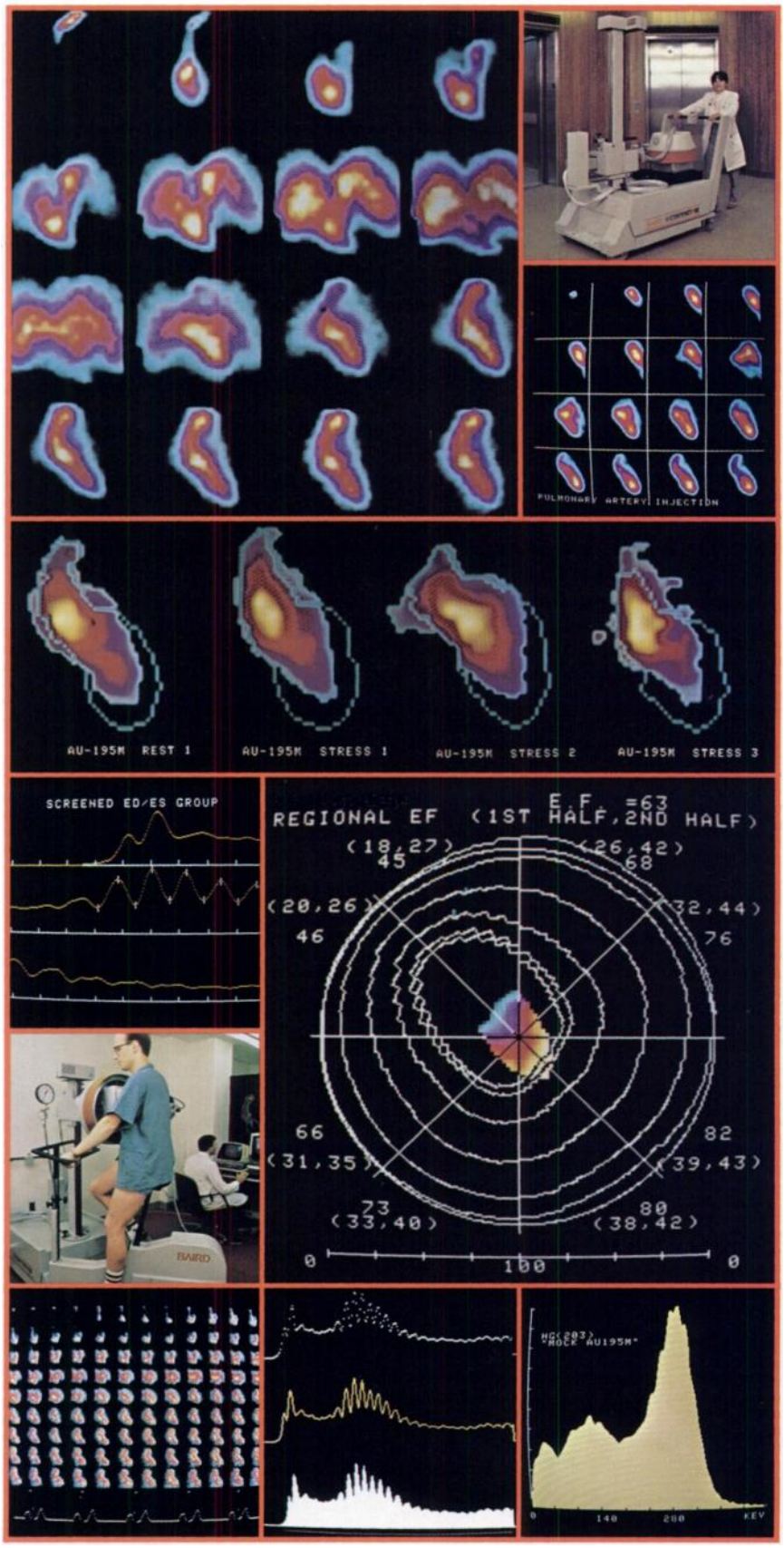

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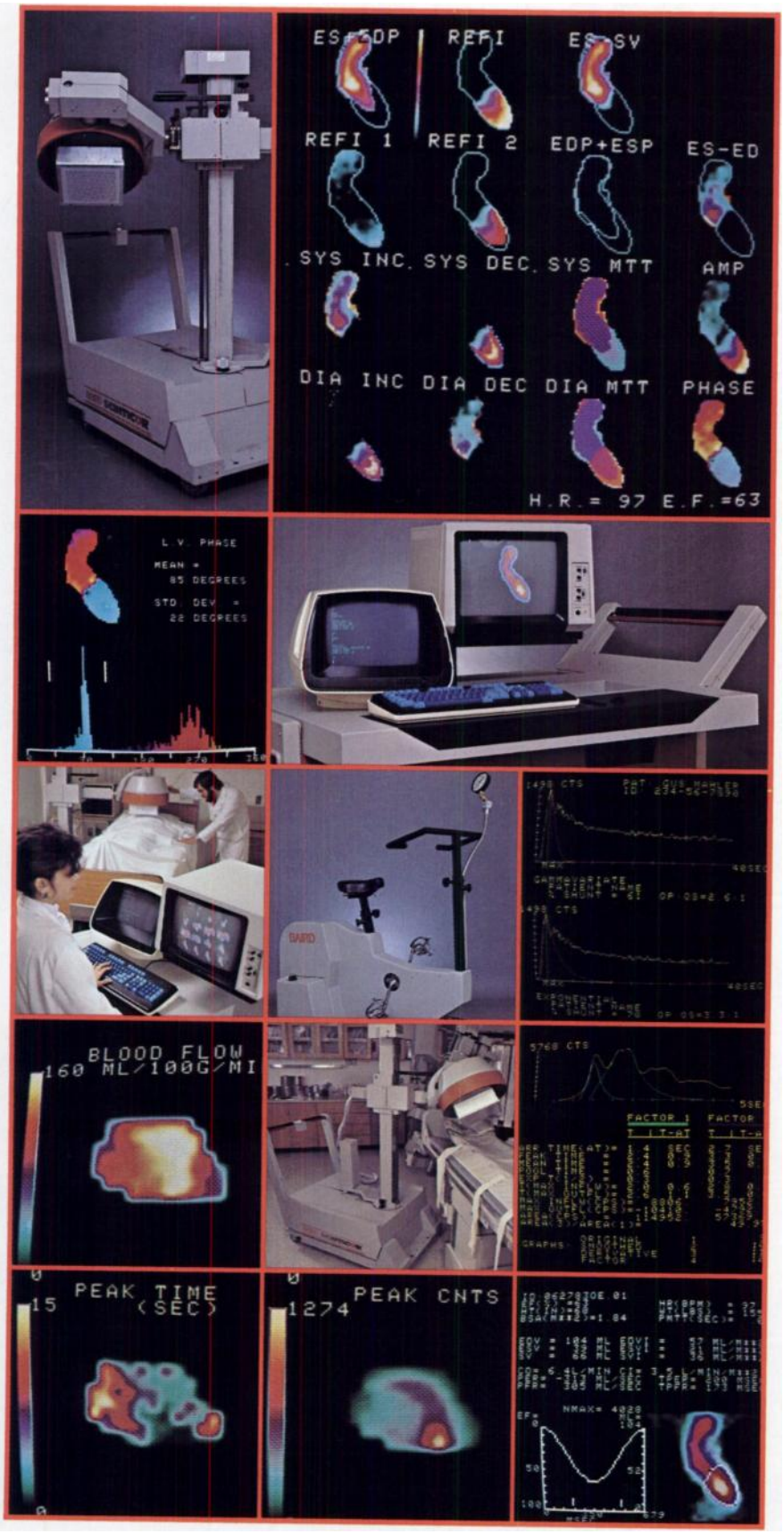

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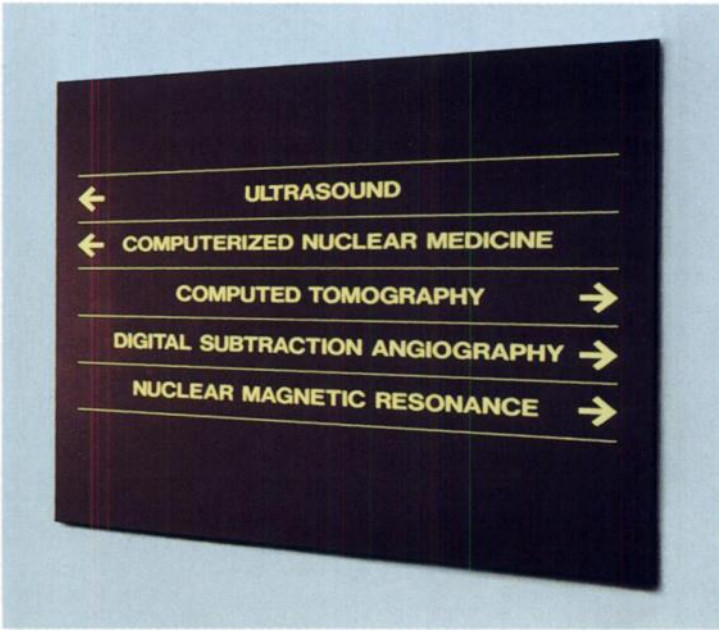

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By *Thomas A. Powers*, MD, Chief, Nuclear Medicine, Veterans Administration Medical Center, Nashville; and *A. Everette James, Jr.*, MD, ScM, JD, Prof. and Chairman, Radiology, Dept. of Radiology Sciences, Vanderbilt Univ. School of Medicine. 192 pp., 479 illus. April 1984. $21.95 *#5109-7.*

Maisey, Britton & Gilday
CLINICAL NUCLEAR MEDICINE

Thirty-two expert contributors present a wide spectrum of clinical situations that focus on the application of nuclear medicine to day-to-day patient management. Fact-filled, clinically relevant articles thoroughly explore: exercise ECG testing and thallium scintigraphy; renal radionuclide studies, including renal transplantation; adrenal imaging; special problems in pediatrics; pre-treatment assessment of cancer; more!

Edited and with contributions by *M.N. Maisey, K.E. Britton, & D.L. Gilday.* 525 pp., 235 illus. 1983. $60.00. *#1087-0.*

Partain, James, Rollo & Price
NUCLEAR MAGNETIC RESONANCE (NMR) IMAGING

State-of-the-art summary of the physical principles, clinical results, and potential of this exciting new technology which permits diagnosis through the use of non-ionizing radiation. Shows how NMR allows low-risk imaging, and how it provides biochemical data on disease and structures.

By *C. Leon Partain*, Phd. MD, Assoc. Prof. and Director, Division of Nuclear Medicine; and *A. Everette James Jr.*, MD, ScM, JD, Dept. of Medical Imaging and Radiological Sciences; both of Vanderbilt Univ. School of Medicine; *E. David Rollo*, MD, PhD, Vice President, Medical Affairs, Humana Incorporated, Louisville; and *Ronald R. Price*, PhD, Dept. of Medical Imaging and Radiological Sciences, Vanderbilt Univ. School of Medicine. 552 pp., 624 illus. 1983. $79.50. *#7098-9.*

Ramsey
DIAGNOSTIC RADIOLOGY OF THE BRAIN: CT, DSA, NMR
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This popular primer is an outstanding introduction to neuroradiologic techniques, with emphasis on computed tomography scanning. And, this edition also presents digital subtraction angiography and nuclear magnetic resonance! The CT scans are correlated with angiograms, radionuclide scans, and plain skull films. The scans themselves are quite varied, many from the latest generation of scanners. Dr. Ramsey has had hands-on experience with NMR, and her NMR section is a most valuable element. Case examples are provided throughout.

By *Ruth G. Ramsey*, MD, Assoc. Prof. of Radiology, Section of Neuroradiology, Rush-Presbyterian-St. Luke's Medical Center, Chicago. 296 pp., 783 illus. Jan. 1984. $24.95. *#1177-X.*

Friedman & Higgins
PEDIATRIC CARDIAC IMAGING

Examines the remarkable advances that encourage new and imaginative approaches to imaging the anatomy, physiology, and metabolism of the heart in infants and children. Emphasis is on new modalities, such as NMR and DSA, and new uses of established methods such as CT and PET. This is a state-of-the-art reference, with clear illustrations throughout. A valuable addition to the literature.

Edited and with contributions by *William F. Friedman*, MD, Prof. and Chairman, Dept. of Pediatrics, UCLA Medical Center; *J.H. Nicholson*, Prof. of Pediatric Cardiology, UCLA School of Medicine; and *Charles B. Higgins*, MD, Prof. of Radiology and Chief, Magnetic Resonance Imaging, Univ. of California, San Francisco. About 320 pp., 274 illus. June 1984. About $39.50. *#1287-3.*

Moss, Gamsu & Genant
COMPUTED TOMOGRAPHY OF THE BODY

Superb new reference incorporates basic anatomy and state-of-the-art techniques! Describes and illustrates the CT features of disease entities, and discusses the relationship between CT and other techniques. Coverage includes scanning techniques, differential diagnostic points, pathologic features of disease, CT in pediatrics, more.

By *Albert A. Moss*, MD, Prof. of Radiology, *Gordon Gamsu*, MD, Assoc. Prof. of Radiology, and *Harry K. Genant*, MD, Prof. of Radiology, Medicine and Orthopaedic Surgery; all of the Univ. of California School of Medicine, San Francisco. 1,201 pp., 1,905 illus. Sept. 1983. $110.00. *#6574-8.*

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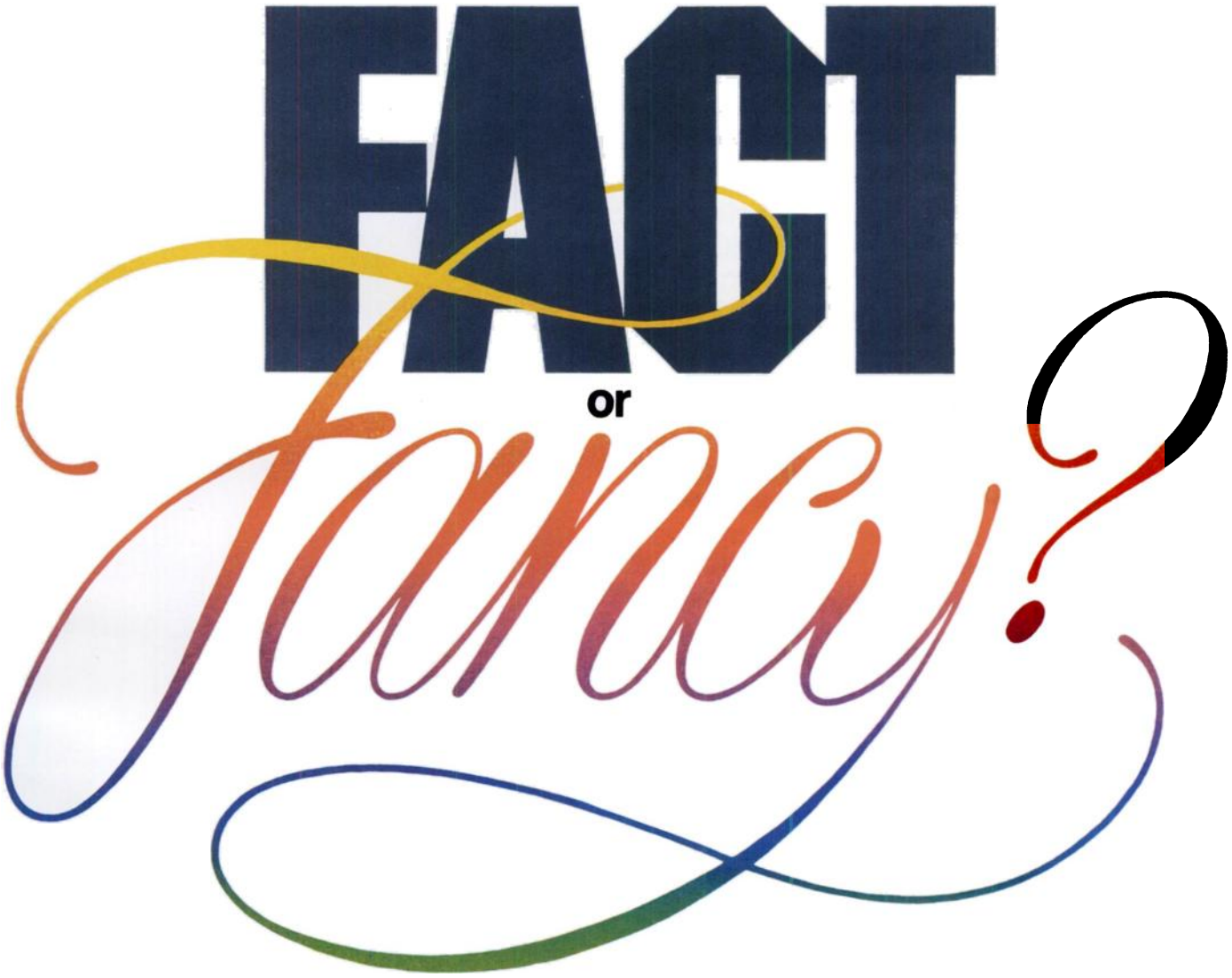

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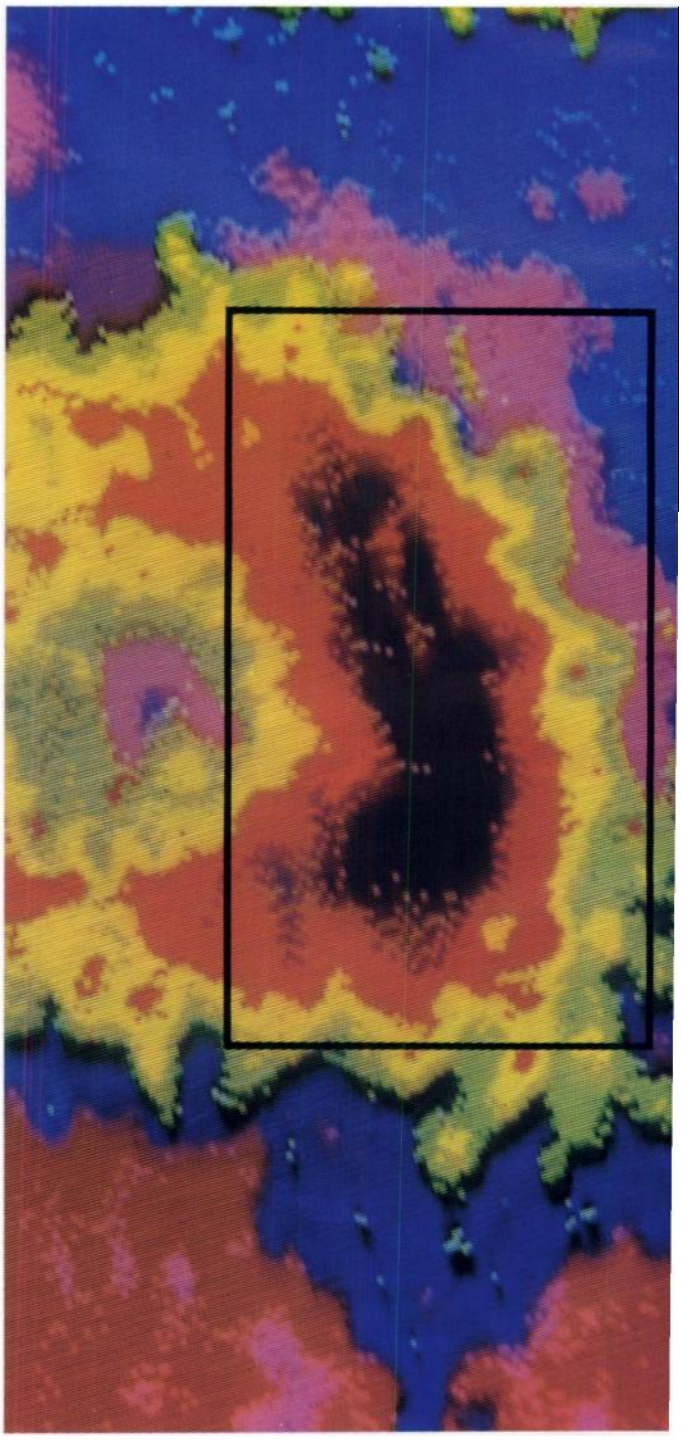

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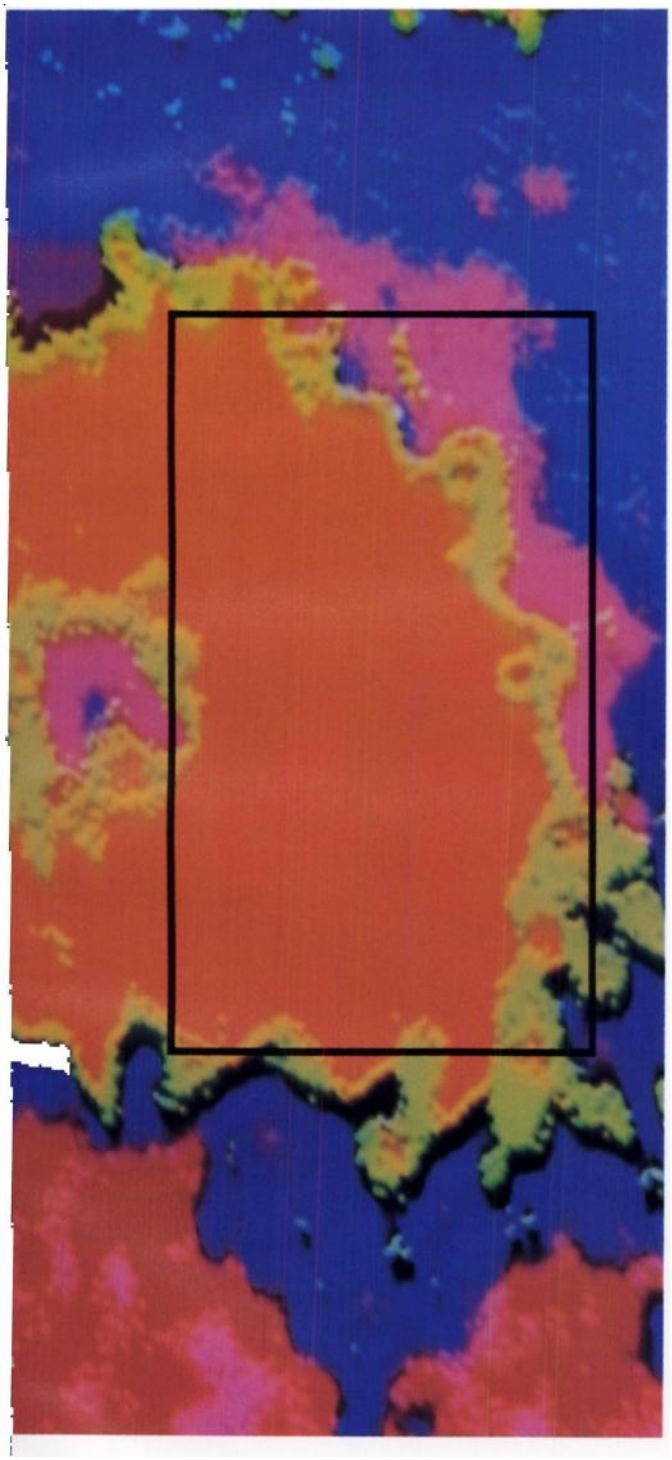

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ZLC with DIGITRAC is the step forward that makes all previous camera technology obsolete. Here's what ZLC with DIGITRAC offers:

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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
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Siemens ZLC 3700 System with whole body table
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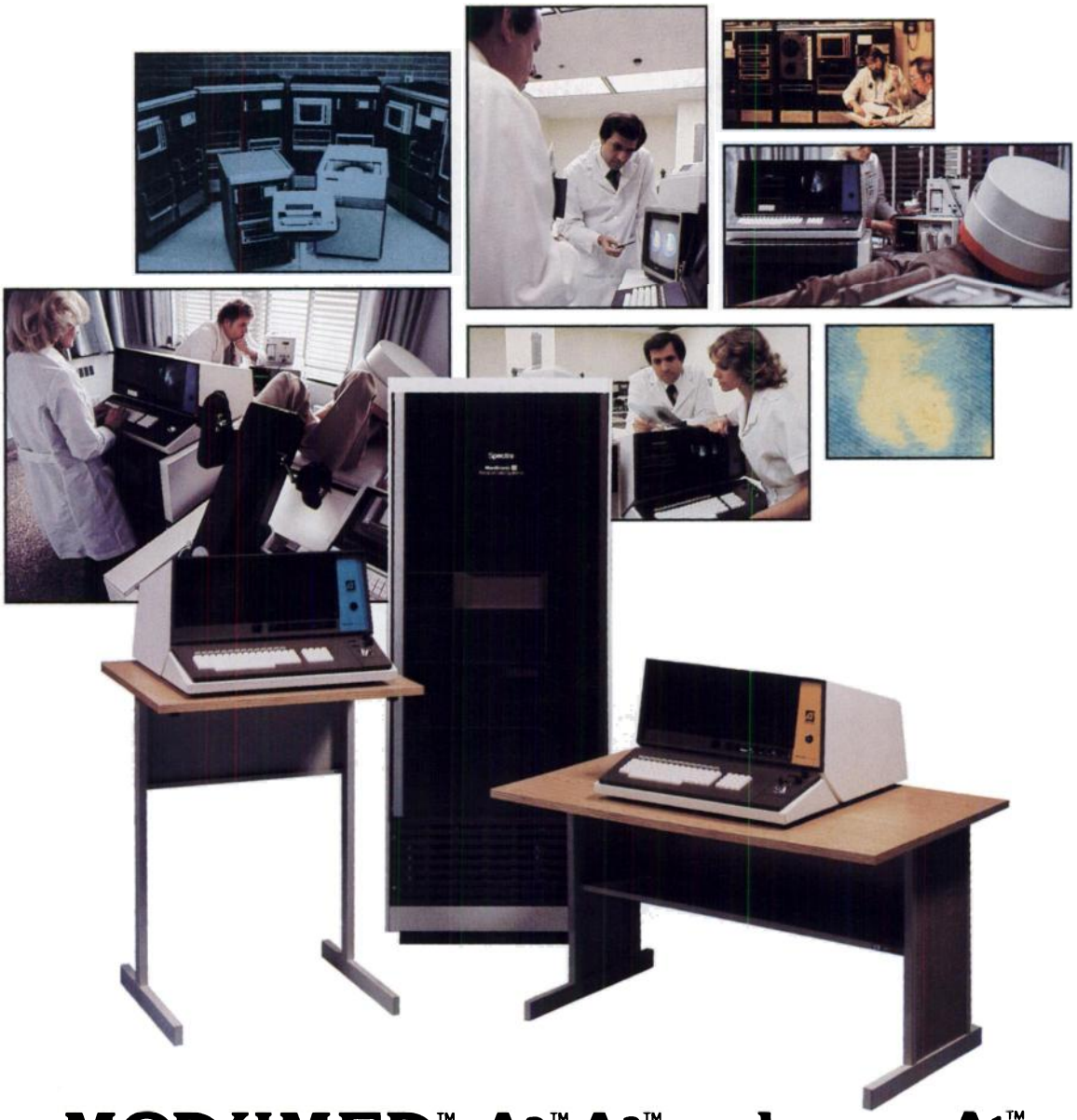
Siemens Nuclear Imaging Systems are quality systems... designed and manufactured to provide you with the most accurate diagnostic information obtainable.

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

Siemens... technology with integrity

From the Leaders in Computerized Nuclear Medicine



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A1 NUCLEAR

Managing Departmental Costs In A Cost Conscious Environment

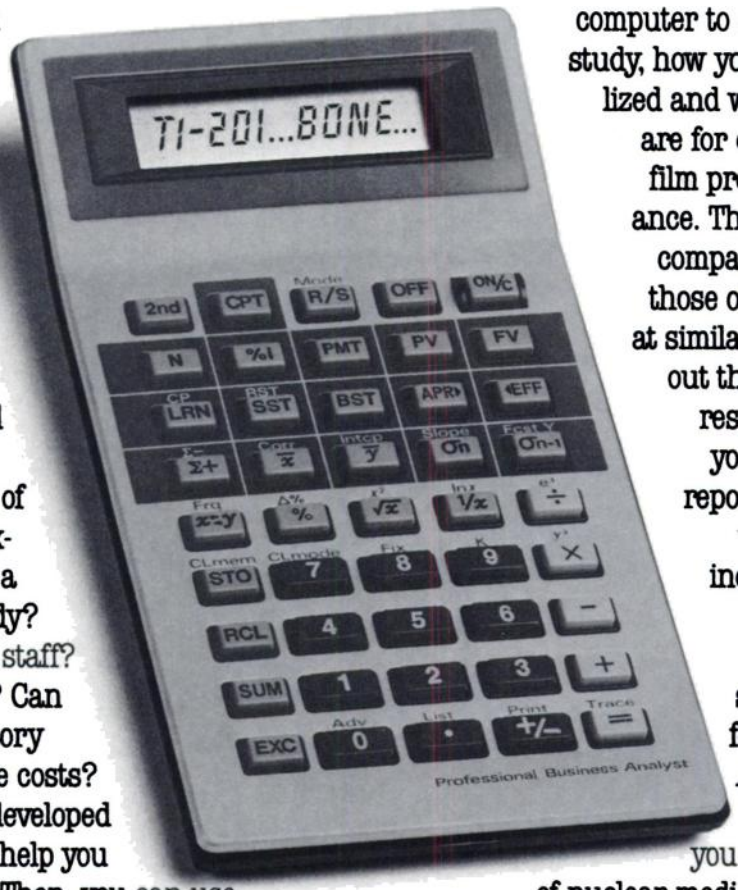
Efficient departmental management is no longer an elective procedure for nuclear medicine.

In the cost-conscious environment of today's hospital, administrators are looking more carefully at departmental budgets. At the same time, attending physicians are ordering tests more selectively, basing their decisions both on the diagnostic information they need and the cost-effectiveness of the study.

Understanding Your Costs

This means that you are being asked to become more of a businessman, adding terms like "efficiency" and "productivity" to your medical vocabulary. Now you have to know the real operating costs of your department. What, for example, does it cost to perform a bone scan? Or a thallium study? Are most costs attributable to staff? To equipment? Or to supplies? Can changes in scheduling, inventory or procedure mix reduce these costs?

At NEN/Du Pont we've developed a computer-based program to help you determine and analyze costs. Then, you can use the results to increase productivity in your department. It's called Financial Management Analysis (FMA) and it's available to all our customers.



FMA—A Management Program For You

Here's how it works. Your NEN/Du Pont representative will help you collect such data as costs for personnel, supplies and instrumentation, the number and kind of studies you perform and the time the studies take. Then, this input will be analyzed by the computer to show your costs per study, how your staff is being utilized and what your total costs are for every category, from film processing to maintenance. The program can even compare your figures with those of other departments at similar hospitals throughout the country. Your representative will present your FMA in a written report, and will review it with you to help you increase the efficiency of your department.

Ask your representative about FMA for your department. And about our other programs to help you meet the challenges of nuclear medicine in the '80s. Our goal is Imaging Excellence: enhancing the image of your department while improving the images in your department.

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

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OSTEOSCAN®-HDP

(Technetium Tc 99m Oxidronate Kit)

THE MALLINCKRODT COMMITMENT to Nuclear Medicine

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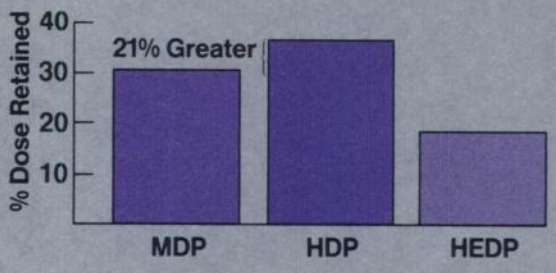
Clinical Studies Verify the Two-Hour Advantage of OSTEOSCAN®-HDP Over MDP in Skeletal Imaging

Higher Bone Uptake Than MDP at Two Hours[2]

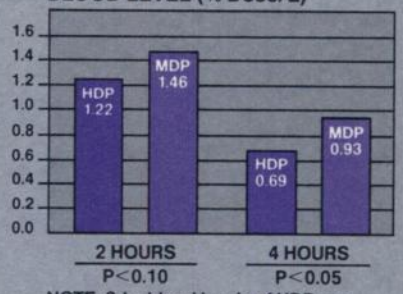
"Image quality is principally related to the absolute retention of the skeletal imaging agent on bone and the time available to allow the soft-tissue tracer component to be excreted by the kidneys."[2] In clinical comparisons,[2] OSTEOSCAN-HDP averaged 21% higher whole body retention than MDP and 99% 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.[6] (No other bone-imaging agent clears faster.) *The resultant low soft-tissue levels permit early imaging and contribute to high-resolution images.*

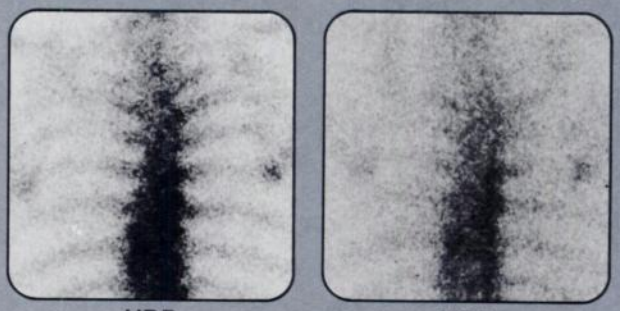
AVERAGE VALUES—10 PATIENTS[5]



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.
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7. Van Duzee BF, Schaefer JA, Ball JD, et al: Relative lesion detection ability of Tc-99m HMDP and Tc-99m MDP: Concise communication. *J Nucl Med* 25: 166-169, 1984.

Please see next page for Osteoscan-HDP prescribing information. ▶

Mallinckrodt®

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Mallinckrodt, Inc.
Post Office Box 5840
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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 dermatological 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.

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.

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.

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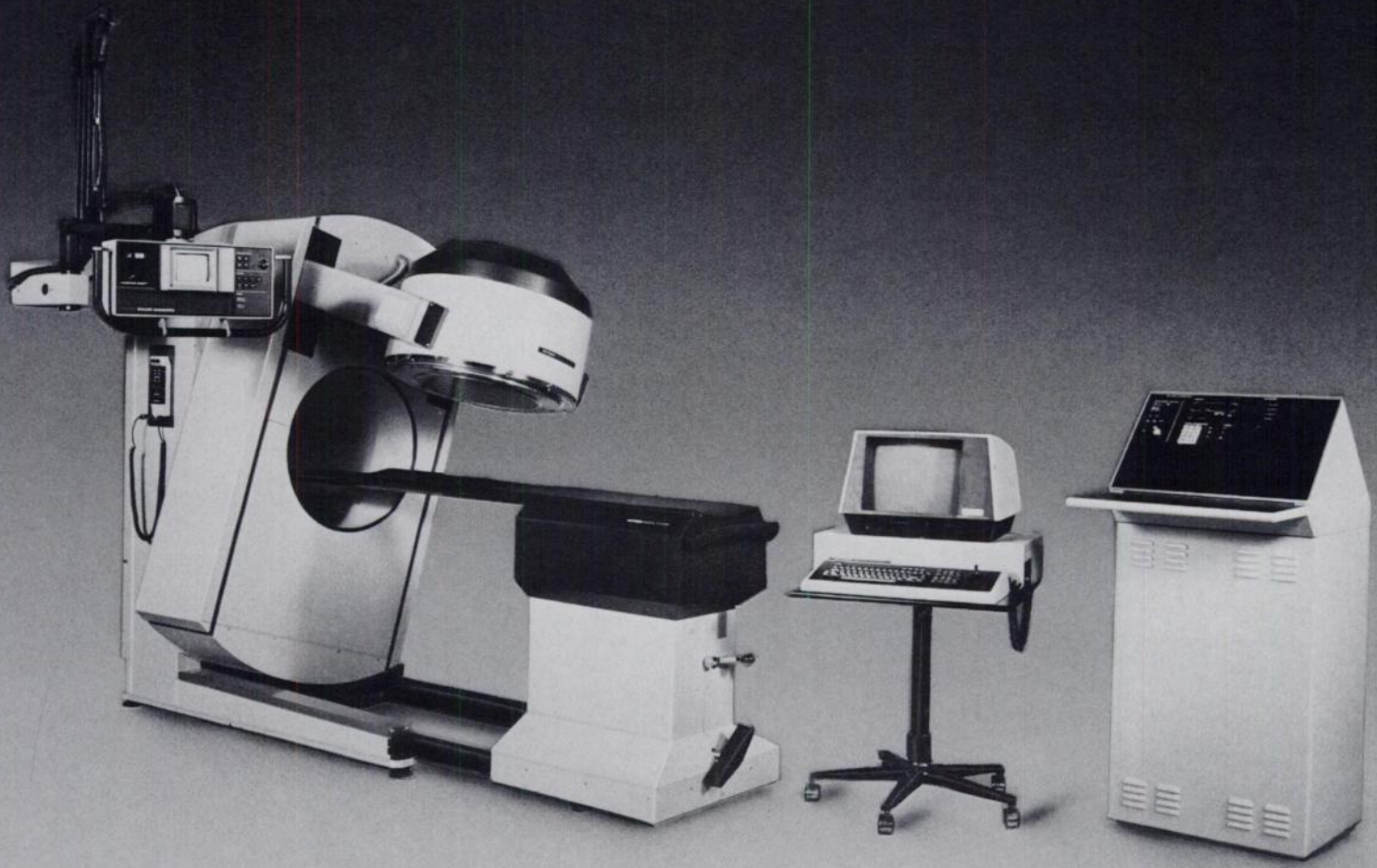

Raytheon Medical Systems has harnessed the imaging power of our exclusive, fourth generation 91-tube detector – complete with variable linearity circuitry – to the profession's most precise gantry system, table and image processing to create the Spectrum 91. The result is the first optimized ECT system... with uncompromised planar capability.

State of the art.

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Total imaging performance.

Spectrum 91 ECT gives you positive imaging control – two ways. First, the Raytheon Digital Parameter Controller gives you fast, accurate and repeatable entry and monitoring functions of all study, system and patient parameters. Status verification is positive... and reassuring.

But that's not all. The Spectrum 91 ECT System can also interface with a variety of computer systems for both gantry control and imaging capability. So the operational choice is left up to you.

Couple all this capability with a unique, interlocking carbon fiber table that easily simplifies all patient imaging... and you'll see exactly why the Spectrum 91 ECT System is a first in so many ways.

Find out about Raytheon's exclusive Spectrum 91 ECT System with a call to your Raytheon dealer. Or contact Raytheon Medical Systems, 2020 North Janice Avenue, Melrose Park, IL 60160. Phone 1-800-323-2213. In Illinois, 1-312-865-2600.

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4. Analyzing your film handling procedures.

Many darkrooms are inconveniently located, putting film-handling procedures outside your control. Video Imaging Specialists are trained to streamline these procedures, minimizing the potential for film rejects.

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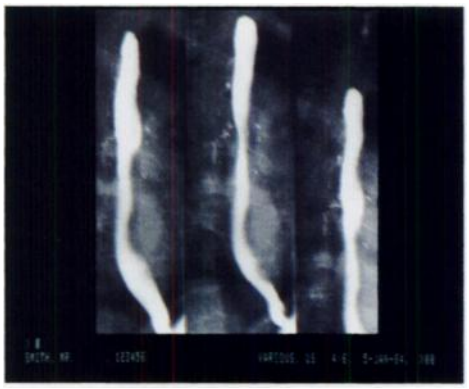
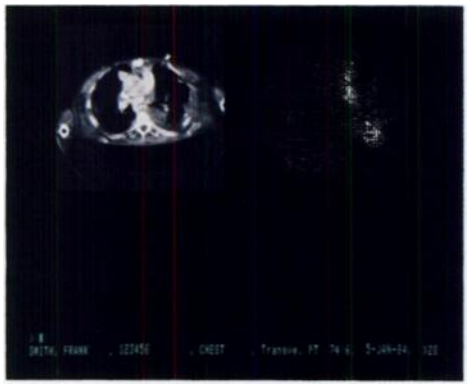
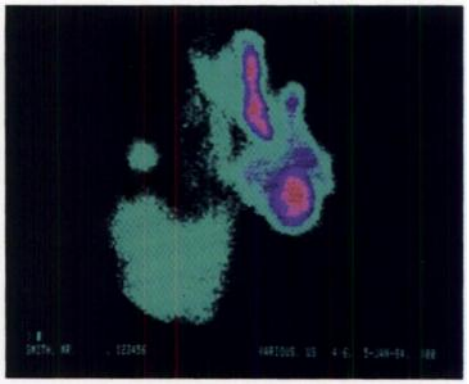


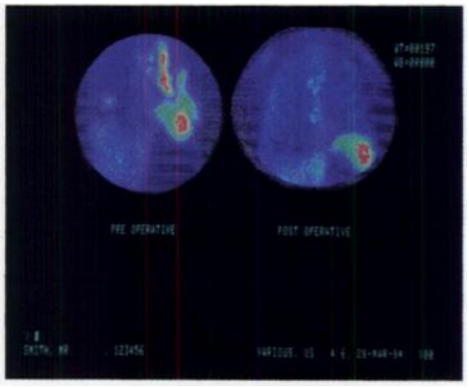
X ray Shows Abnormal Fluid Collection Between the Esophagus and the Aorta



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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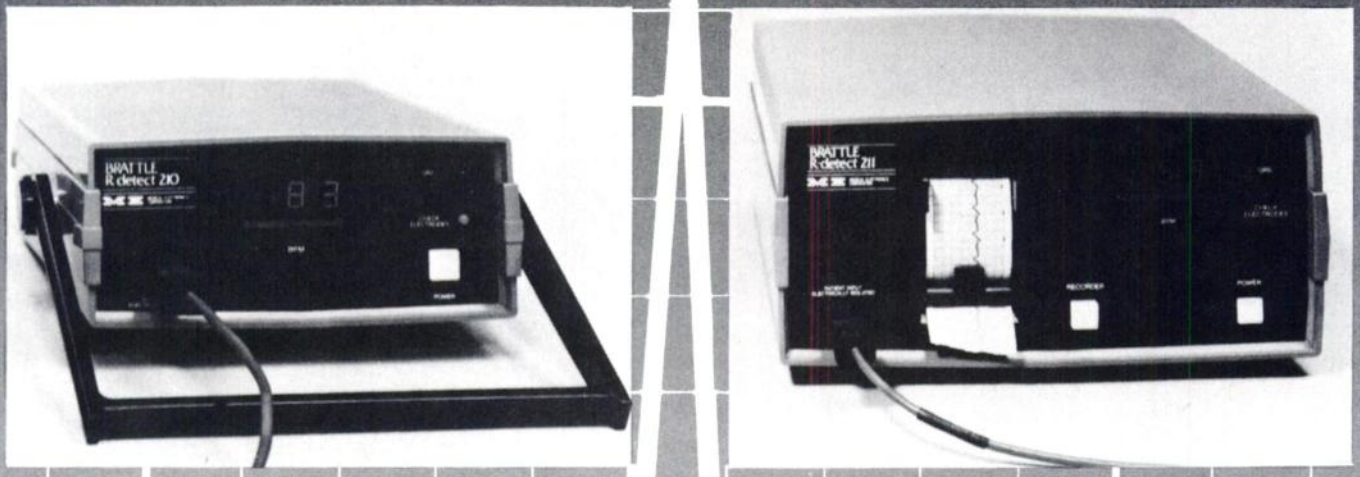

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NEW!

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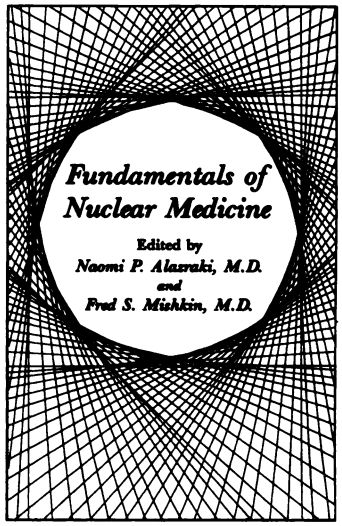

Edited by
Naomi P. Alazraki, MD, and Fred S. Mishkin, MD

Other Contributors: Manuel L. Brown, MD, Frederick L. Datz, MD, Leon S. Malmud, MD, Isaac C. Reese, PhD, Barry A. Siegel, MD, James A. Sorenson, PhD, Leroy A. Sugarman, MD, Andrew T. Taylor, Jr., MD, Heidi S. Weissmann, MD, Henry N. Wellman, MD

208 pp; 6 × 9" softcover
Publication Date: June 1984
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. . . a basic introductory guide to acquaint medical students and physicians with the most useful nuclear medicine techniques for detecting and evaluating common disorders.

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   Radiation Effects
   Imaging of Radiation
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   Sensitivity, Specificity, and Prior Probability

Organ Imaging With Radionuclides
3. Thyroid Uptake and Imaging
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7. Biliary Tract
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9. Skeletal System
10. Central Nervous System

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11. Trauma
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13. Cancer

Nonimaging Diagnostic Techniques
14. Nonimaging Procedures

Appendix
Glossary
Index

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Who has the largest installed base? Judge for yourself. Technicare Teslacon™ MR imaging systems are currently in operation at 38 clinical sites worldwide, more than any other manufacturer. That means more practical experience in all aspects of MR – from site planning to installation to service to imaging itself.

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2 New Patient Information Pamphlets

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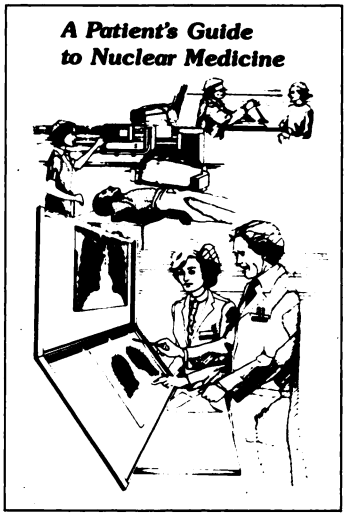

Well illustrated, this 16-page pamphlet explains what nuclear medicine is, how the procedures are performed, and how they can help in the early detection of disease.

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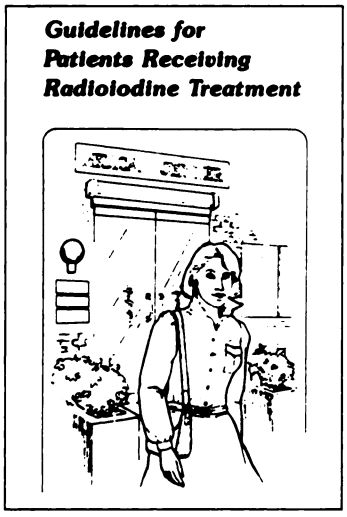

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Technology of Nuclear Magnetic Resonance

Edited by

Peter D. Esser, PhD, and R. Eugene Johnston, PhD

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Contents

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Overview of NMR Reconstruction Principles, *T.M. Peters and B.C. Sanctuary*

Optimization of Signal-to-Noise Ratio in NMR System Design, *Mark E. Riehl and Robert E. Glusick*

An Introduction to the Applications of Fourier Transform Analysis in Medical Imaging, *William G. Hawkins and Peter D. Esser*

II. Pulse Sequences and Parameter Extraction

Uncertainties in the in vivo Measurement of Relaxation Parameters, *G. Allan Johnson, Robert Herfkens, Mark A. Brown, and James R. MacFall*

Pulse Sequence Considerations For Computed T_1, T_2, and Spin Density Images, *James R. MacFall*

NMR Image Synthesis in Realtime, *Stephen J. Riederer, Stuart A. Bobman, Steven A. Suddarth, James N. Lee, Henry Z. Wang, and James R. MacFall*

A Systematic Approach to Optimization of Pulse Sequences in NMR Imaging By Computer Simulations, *Gernot Bielke, M. Meves, S. Meindl, A. Bruckner, W. v.Seelen, P. Rinck, and P. Pfannenstiel*

III. Flow and Motion

Flow and Motion in NMR Imaging: A Tutorial Introduction, *Richard E. Wendt III, Paul H. Murphy, Joseph J. Ford, R. Nick Bryan, and John A. Burdine*

Gated Cardiac Imaging with Nuclear Magnetic Resonance (NMR) Techniques, *William J. MacIntyre, Raymundo T. Go, Bruno J. Sufka, James K. O'Donnell, Hong N. Yeung, David H. Feiglin, and William Pavlicek*

Imaging True Motion Velocity and Higher Order Motion Quantities by Phase Gradient Modulation Techniques for NMR Scanners, *Paul R. Moran and Richard A. Moran*

IV. New Techniques

In Vivo Spectroscopic Imaging, *A.A. Maudsley*

In vivo Breast Magnetic Resonance Imaging Using a Prototype Breast Coil, *Paul C. Wang, Carol B. Stelling, Sally S. Mattingly, and Deborah E. Powell*

Three-Dimensional Display of NMR Images, *John D. Austin, Benjamin M.W. Tsui, Dorothy C. Strickland, Stephen M. Pizer, Edward V. Staab, and C. Leon Partain*

A Universal Pulse Programmer for NMR Imaging, *Dye J. Jensen, William W. Brey, Victor Tong, Ponnada A. Narayana, and Jean L. DeLayre*

V. Installation Considerations

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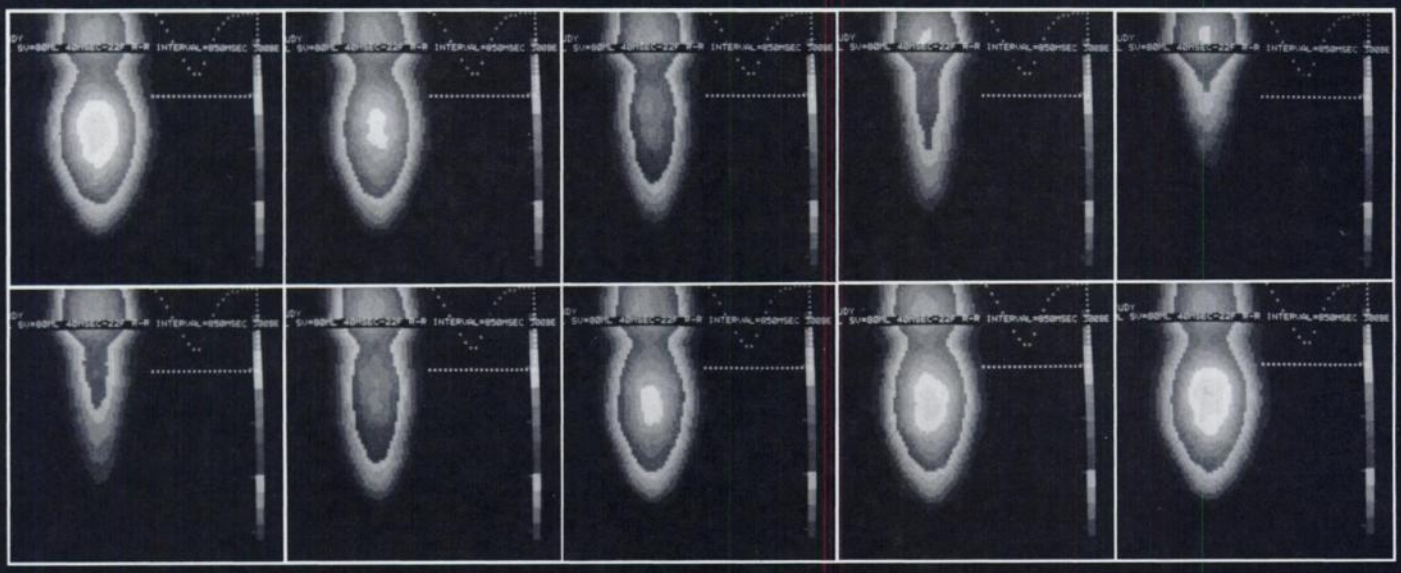

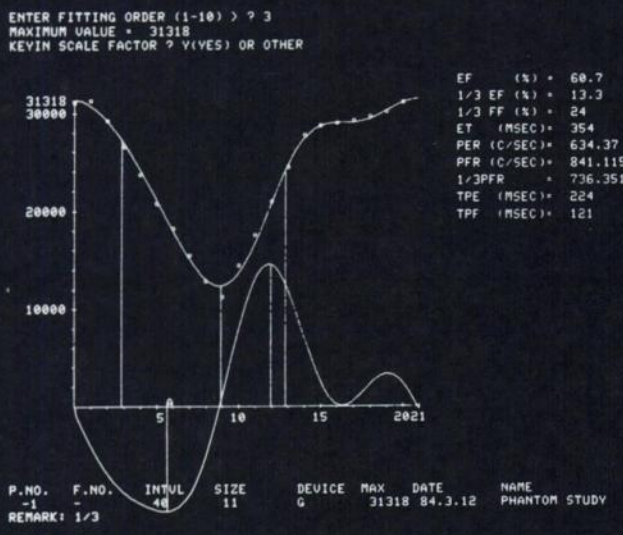

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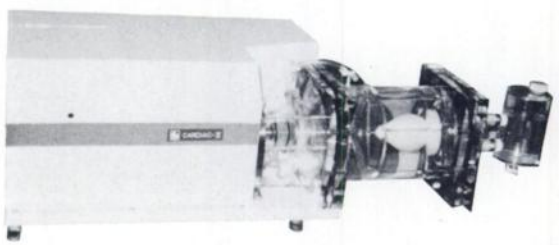

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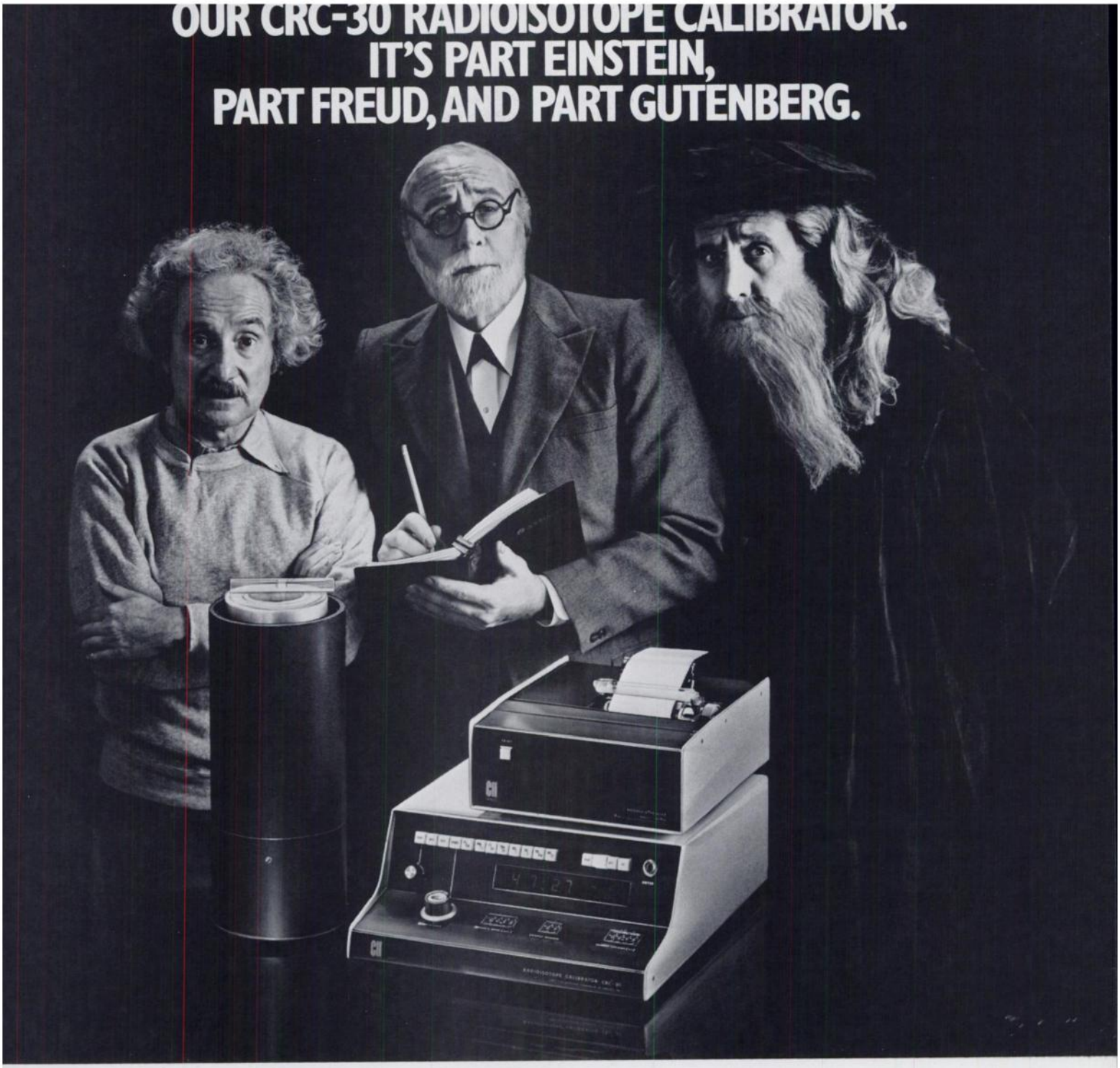

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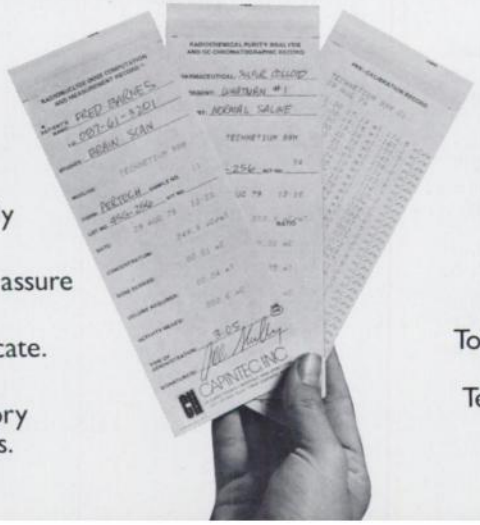

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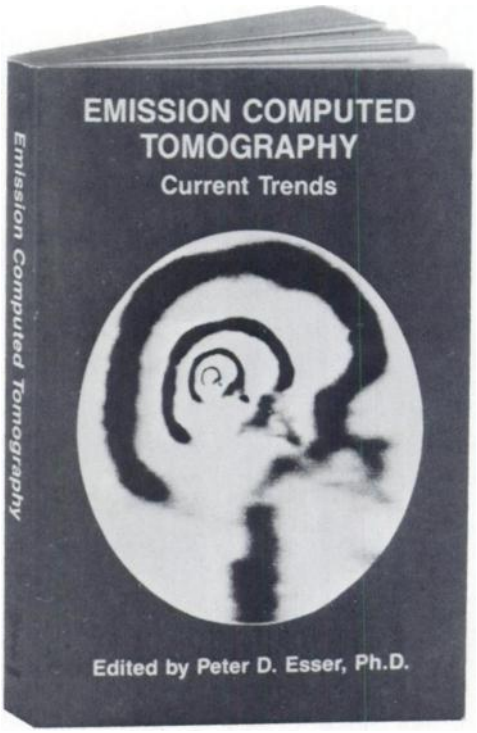

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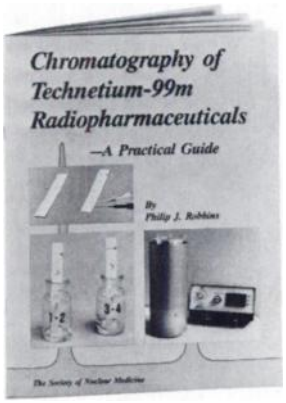
by Philip J. Robbins



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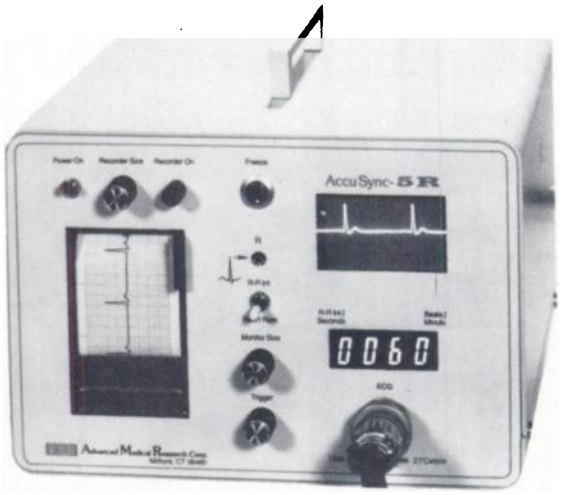

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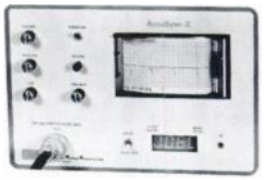

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NUCLEAR MEDICINE TECHNOLOGIST. The Veterans Administration Medical Center Danville, Illinois is recriting for a Nuclear Medicine Technologist. Performs a full range of nuclear medicine duties including nuclear cardiology. The VA Medical Center, Danville, 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.

NUCLEAR PHARMACIST. Thomas Jefferson University Hospital, a major tertiary-care urban teaching institution, is seeking a Pharmacist with training in nuclear pharmacy. The Nuclear Pharmacist is responsible for the preparation and quality control of all radiopharmaceuticals used in our nuclear medicine department. Teaching opportunities include instructing nuclear medicine technologists and pharmacy students in nuclear pharmacy concepts. This established position provides excellent opportunities for personal and professional growth, including participation in interdisciplinary radiopharmaceutical research. Employees enjoy a highly competitive package of salary and benefits. Applicants should forward a resume, preferably with letters of reference and a cover letter, to: M. Thakur, Ph.D., Dept. of Radiation Therapy, Thomas Jefferson University Hospital, 10th & Sansom Streets, Main Building, Philadelphia, PA 19107. Equal Opportunity Employer.

Positron Emission Tomography (PET). Unusual career opportunity for academically oriented PHYSICIST with research interest in PET instrumentation and image reconstruction/quantitation. Excellent computing and image processing facilities, full-time hardware, and software support. Background in medical physics helpful but not essential. Competitive salary, excellent benefits. For more information write to: D.A. Rottenberg, MD, Department of Neurology, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021, or call (212)794-7045. Equal Opportunity Employer.

TECHNICAL DIRECTOR NUCLEAR MEDICINE. We are a 165-bed, acute-care hospital. Attractive salary, benefits, and pension program. Requirements include national registration, preferably with 2 years experience in nuclear medicine. Located in university town of 89,000 with 2 rivers, 3 lakes, and rolling countryside. Chosen by Money Magazine as one of the 10 best small cities in America. Send resume or call: Personnel Department, Angelo Community Hospital, 3501 Knickerbocker Rd., San Angelo, TX 76904; (915)949-9511, ext. 409. EOE.

POSITIONS WANTED

NUCLEAR MEDICINE PHYSICIAN. ABR certified, ABNM eligible. 2 yr. Nuclear Medicine completed plus will finish research fellowship 1984. Desires position in Northeast for September '84. Send inquiries to: Box 702, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

Faculty Position Available
RADIOPHARMACY

The University of New Mexico College of Pharmacy is now accepting applications for a position in Radiopharmacy at the Associate Professor/Professor level—depending on qualifications and experience. The position also entails directorship of the Centralized Radiopharmacy located on the UNM North Campus. Deadline for applications is August 1, 1984. The position is a tenure track, twelve-month appointment. Salary is open.

Academic requirements preferred for the position include a Bachelor of Science degree in Pharmacy and a M.S. or Ph.D. in Radiopharmacy or a related field. The individual will have primary responsibility for the undergraduate, residency, and a graduate M.S. degree program in Radiopharmacy. He/she will also have responsibility for supervising the operational activities of the Centralized Radiopharmacy which serves as a teaching laboratory, and services several hospitals in Albuquerque and the surrounding area.

Radiopharmacy facilities allow for both teaching and research, and its location provides for opportunities for interdisciplinary activities with the School of Medicine and the UNM Cancer Research Center.

The University of New Mexico is an Equal Opportunity Employer and an active participant in a state-wide Affirmative Action Program. Individuals interested in the above position should submit a curriculum vitae and accompanying letter to:

William B. Hladik III
Chairperson, Search Committee
College of Pharmacy
University of New Mexico
Albuquerque, NM 87131

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This space contributed as a public service.

RADIOCHEMIST

The Oak Ridge National Laboratory invites applications from experienced candidates with a Ph.D. or equivalent and a minimum of 1 to 2 years relevant experience in nuclear chemistry, radiochemistry, or related areas. The duties involve coordinating target fabrication, radionuclide production and processing, radiochemistry and radionuclide generator development. This position is within our Nuclear Medicine Group in the Health and Safety Research Division of ORNL.

ornl offers an excellent benefits package and a generous relocation program plus a stimulating working environment. U.S. Citizenship required.

Qualified applicants should forward resume, three letters of recommendation, and academic transcripts to:

Mr. J.T. Atherton
Technical Employment Manager
Oak Ridge National Laboratory
Building 4500N
Oak Ridge, TN 37831

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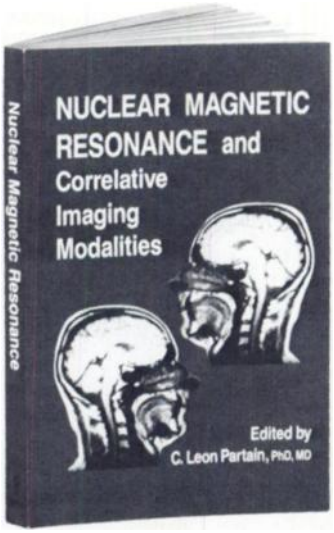
NUCLEAR MAGNETIC RESONANCE and Correlative Imaging Modalities

Edited by C. Leon Partain, PhD, MD



6 × 9″ softcover; 312 pages
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Publication Date: January 1984

This multi-authored book contains state-of-the-art summaries on ultrasound, x-ray, computed tomography, and digital radiography in addition to NMR. The correlative aspects of each modality with nuclear medicine are investigated. Material devoted to NMR covers topics such as basic principles and instrumentation; considerations of site preparation; safety and quality control; pulse sequences and tissue contrast; and the current clinical results at certain hospital installations. Facts on the economic, legal, and political aspects of NMR are also included.

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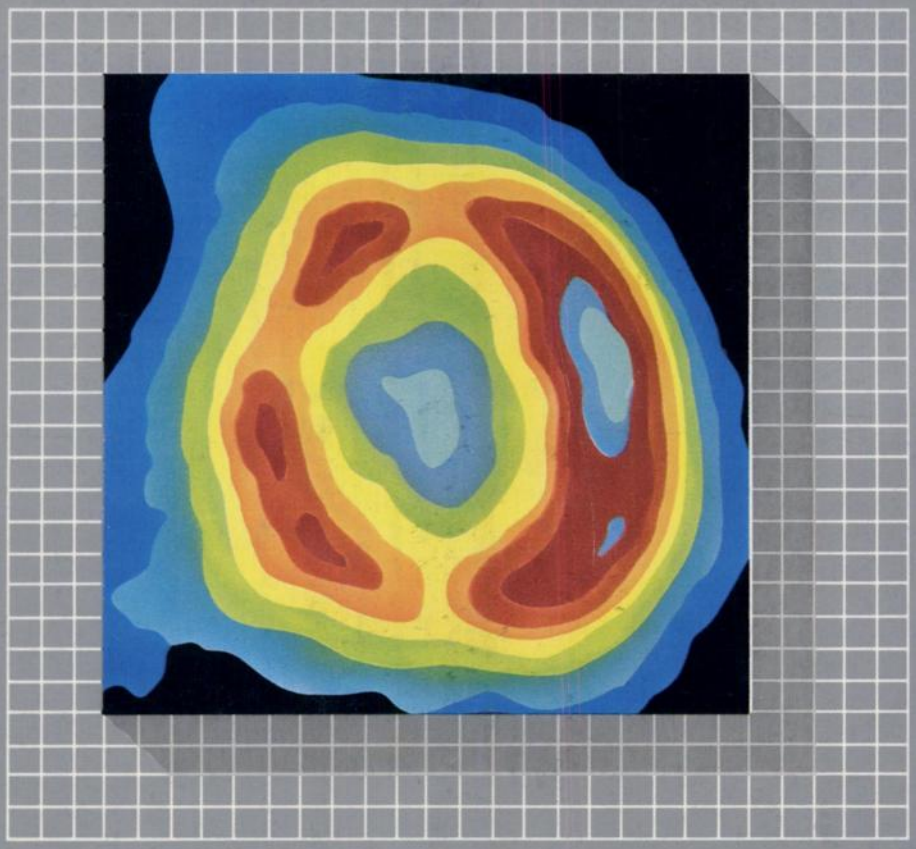
Thallous Chloride Tl 201



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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 96.0% 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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