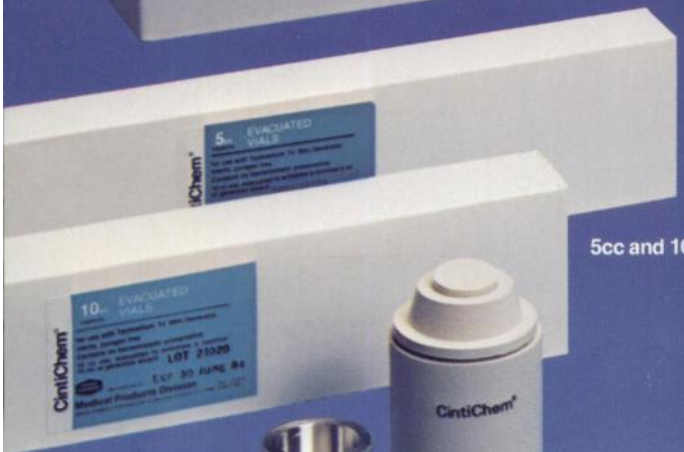
ROCHE®

medi+physics®

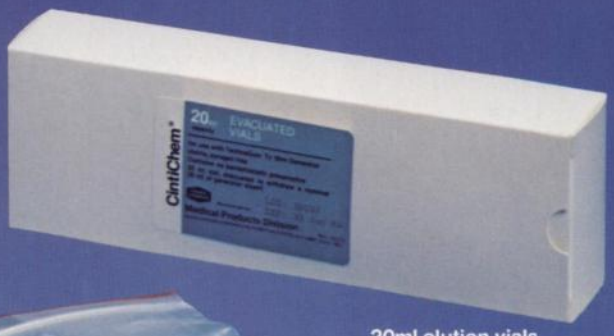
MEDI-PHYSICS, INC., RICHMOND, CALIF. 94806
SUBSIDIARY OF HOFFMANN-LA ROCHE INC.

Technetium Tc 99m Generator

Secondary shield to further reduce radiation



5cc and 10cc elution vials



20ml elution vials available on request

Elution vial shield

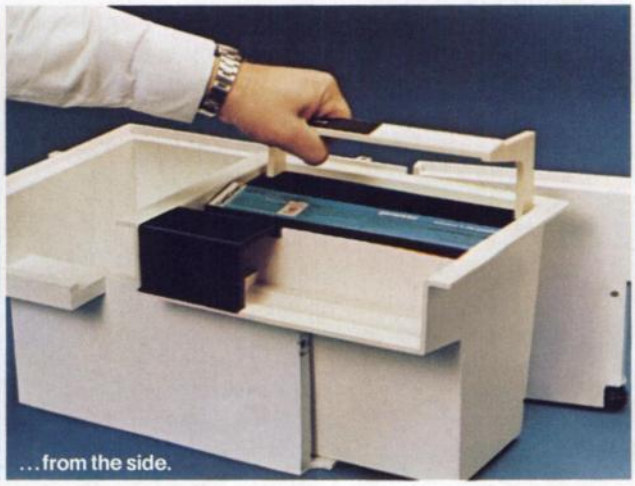
Adaptors for various elution vials

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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MEDI-PHYSICS, INC., RICHMOND, CALIF. 94806
SUBSIDIARY OF HOFFMANN-LA ROCHE INC.

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

June, 1983
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Tuxedo, N.Y. 10987

Announcing . . .
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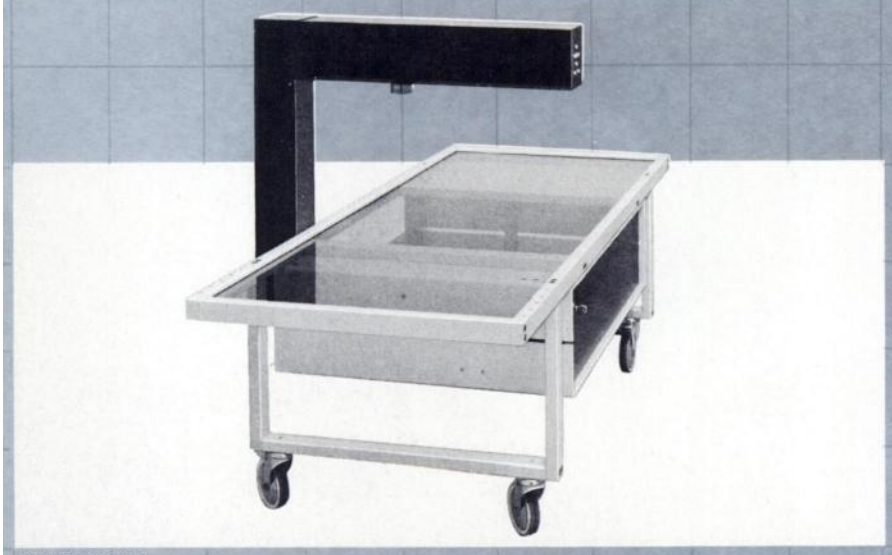

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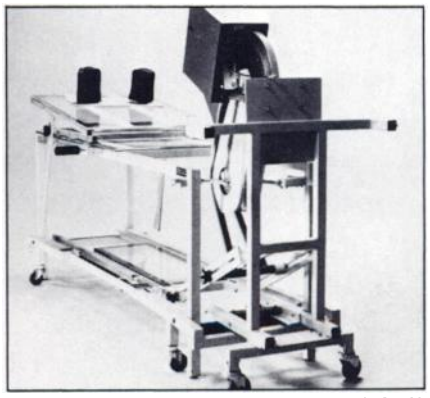
At Nuclear Data, we are impressed with this new team and feel you will be too when you meet and work with them.



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For some, it's the superior quality we build into each of our kits. Quality that gives labs the accuracy and dependability they need.

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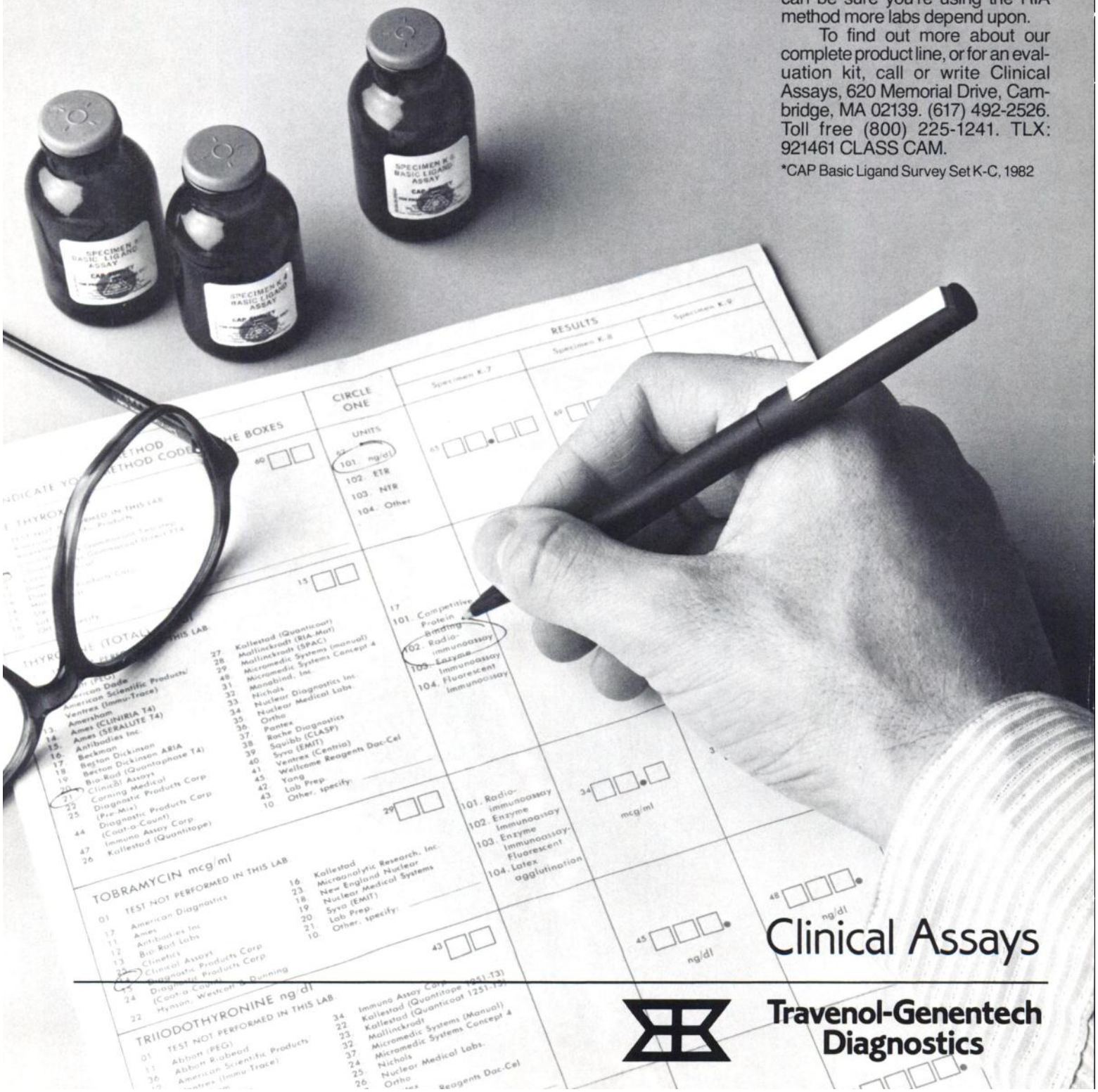
*CAP Basic Ligand Survey Set K-C, 1982



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Meeting your requirements now and for the future, Nuclear Pharmacy Incorporated.
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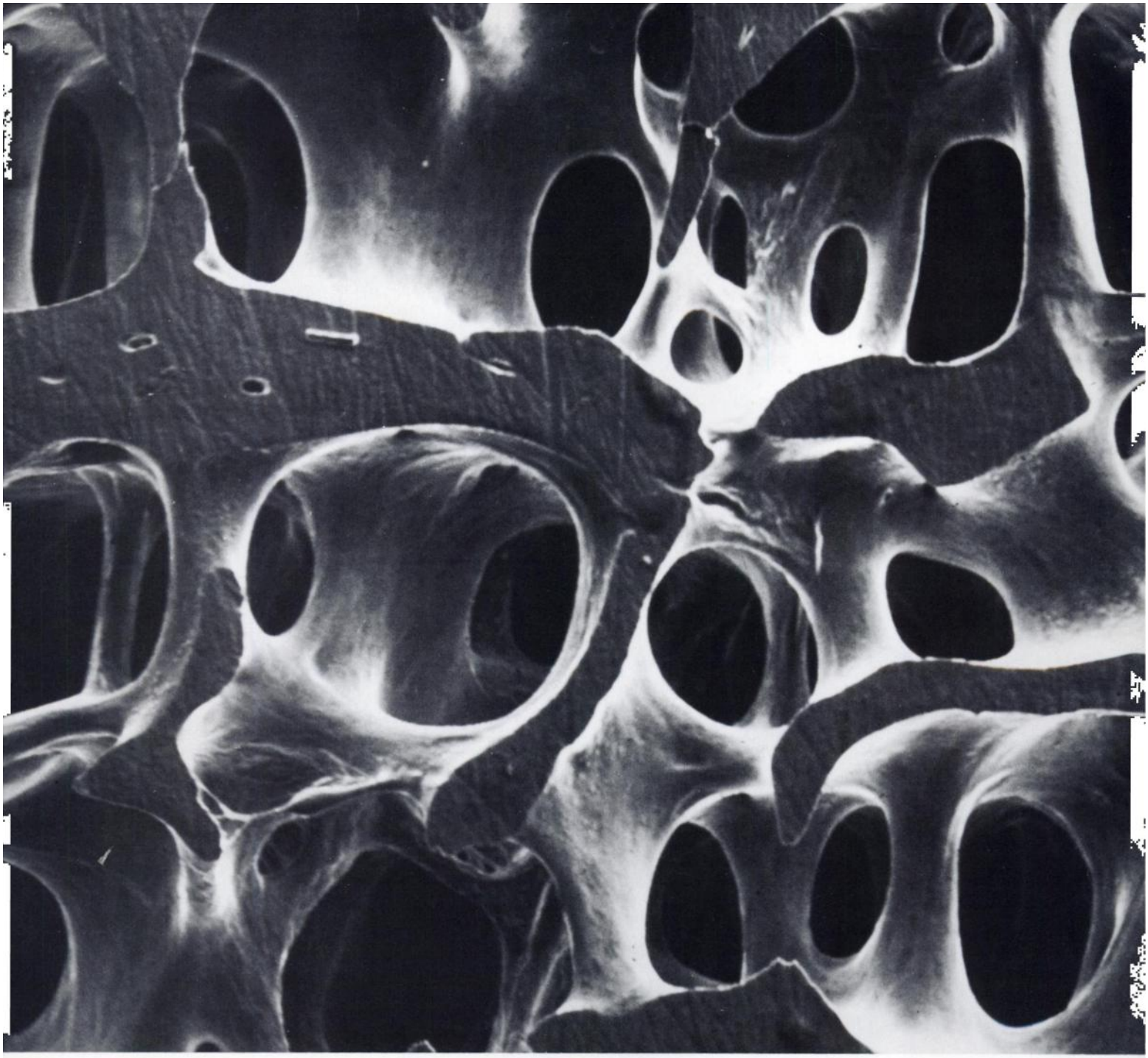

WHERE THE ACTION IS! DUAL-PHOTON ABSORPTIOMETRY OF TRABECULAR BONE

Metabolic bone diseases, such as osteoporosis and renal osteodystrophy, affect trabecular bone preferentially. The new cures for these conditions usually are evident only in trabecular bone. That's why outmoded forearm densitometers missed the boat. Try the automated DP3 SPINE SCANNER – "The Clinical Solution" – unparalleled for diagnostic accuracy and monitoring sensitivity plus super on-site training and service. A complete line of instrumentation you can be sure of from THE LEADER IN BONE MEASUREMENT.

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Building Your Practice On The Challenges Of Prospective Payment

Prospective Payment is changing the practice of nuclear medicine.

In many hospitals, the advent of diagnosis related groups (DRGs) is already reducing the number of referrals, changing the mix of studies performed and putting off the purchase of requested instrumentation.

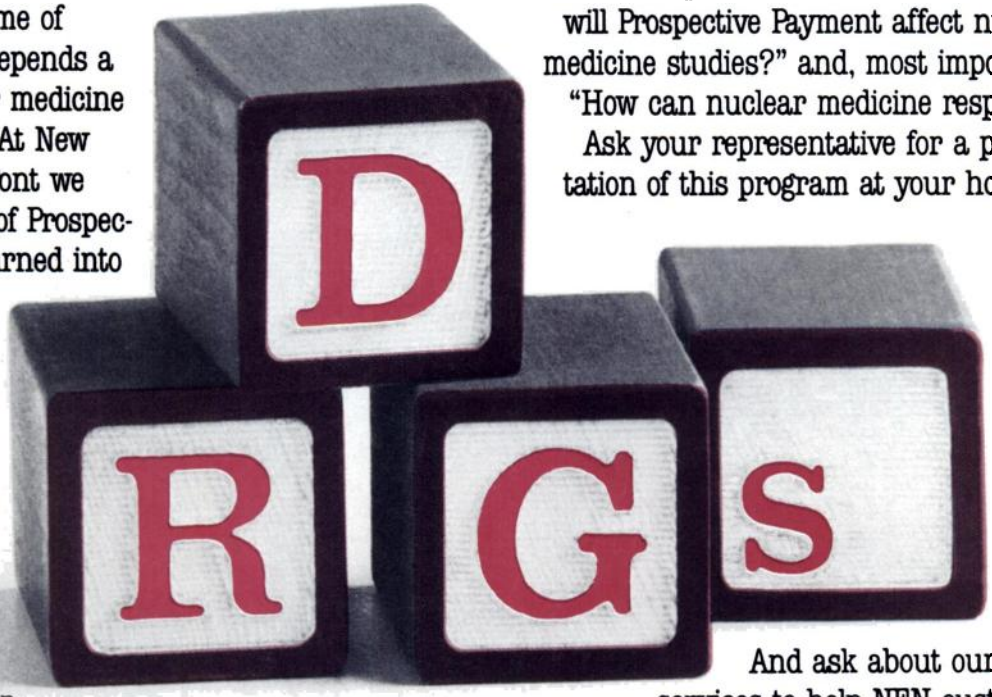
Helping our customers respond

What will be the outcome of these changes? That depends a lot on how the nuclear medicine department responds. At New England Nuclear/Du Pont we believe the challenges of Prospective Payment can be turned into opportunities for nuclear medicine. And we'd like to show you how.

As a service to our customers, NEN/Du Pont has developed a series of programs designed to help nuclear medicine departments, referring physicians and hospital administrators learn about the probable impact of the new reimbursement system—and the ways they can respond to ensure continued excellence in medical care consistent with cost-effective management.

DRG symposia at your hospital

The first program, called "Prospective Payment and Nuclear Medicine: Concept, Impact and Action," will be presented in symposia throughout the country by NEN/Du Pont representatives trained in understanding the contributions nuclear medicine can make to cost-conscious medical practice. Each symposium covers a wide variety of topics—from "What are DRGs?" and "How can hospitals control costs?" to "How will Prospective Payment affect nuclear medicine studies?" and, most important, "How can nuclear medicine respond?" Ask your representative for a presentation of this program at your hospital.

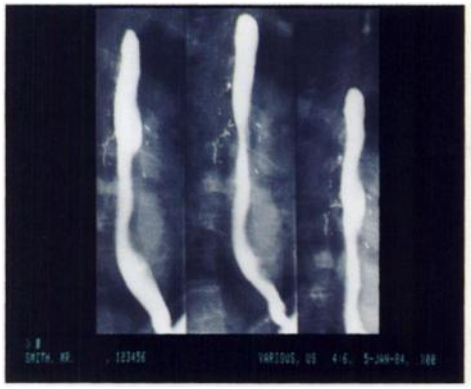


And ask about our other services to help NEN customers build referrals, increase operating and financial efficiency and ensure the quality of their studies. Our goal is Imaging Excellence: enhancing the image of your department while improving the images in your department.

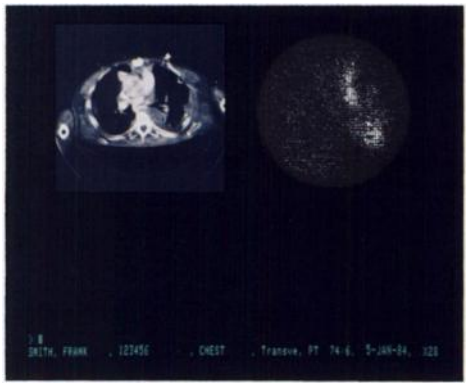
IMAGING EXCELLENCE

NEN New England Nuclear®

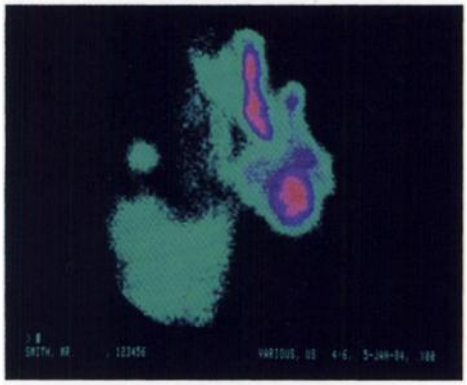
DUPONT



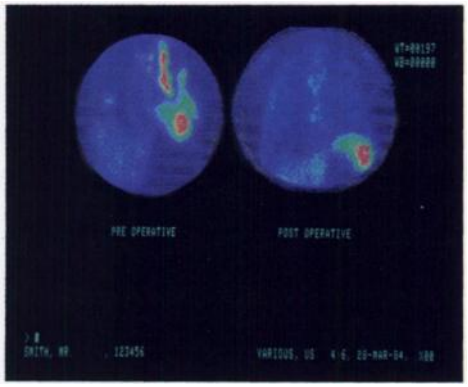
X ray Shows Abnormal Fluid Collection Between the Esophagus and the Aorta



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

BECAUSE THE TOUGH QUESTIONS NEVER GET ANY EASIER.

CDA gives you the imaging and information resource you need to answer even the toughest questions with speed and surety. Use our MicroDELTA™ acquisition and analysis instruments to gather and interpret patient images. Call up and compare critical multimodality images directly in your office or reading room in a matter of seconds. Build a department archiving and retrieval capability with our MaxDELTA™ System. Work directly with our broad range of applications protocols, or write your own advanced applications in minutes using MEDICL™, our unique, interactive imaging command language. Increase the productivity of your research efforts with our DELTApro™ professional imaging workstation. Gain management and information resources like: word processing, equipment scheduling, spread-sheet analysis, and report generation. Put this advanced nuclear medicine imaging and information system to work for you. It's your first step toward a fully realized PACS.

For a demonstration call Linda Holland at (617) 647-1900, or write Computer Design & Applications Inc., 411 Waverly Oaks Road, Waltham, MA 02154. Telex: 92-2521. In Europe: CDA International, Spaldingstrasse 1, 2000 Hamburg 1, West Germany. Telefone: 040/23 06 35. Telex: 2174-311.

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

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The finest R-wave Triggering device available for computerized gated cardiac studies.

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- Isolation Amplifier for Patient Safety.
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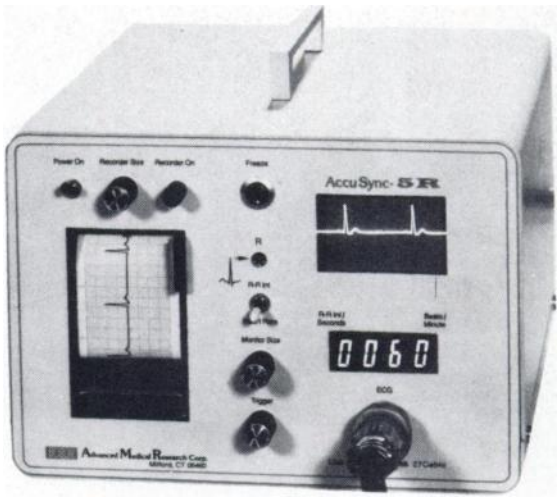
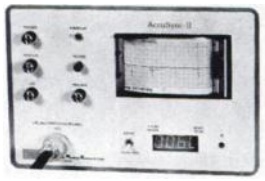


MODEL	FEATURES
AccuSync-6	All **AccuSync-5R** features with the exception of the Strip Chart Recorder.
AccuSync-IR	All **AccuSync-5R** features with the exception of Digital CRT Monitor.
AccuSync-2	All **AccuSync-IR** features incorporated into a Module designed to fit into certain Mobile cameras.
AccuSync-3	All **AccuSync-IR** features with the exception of the Strip Chart Recorder and Playback Mode.
AccuSync-4	All **AccuSync-3** features with the exception of the Heart Rate/R-R int. display.



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Measurements of Regional Cerebral Blood Flow (rCBF) by 2-D noninvasive 133-Xe clearance techniques provide a reliable method for the functional assessment of brain pathophysiology. The method is being increasingly used within the fields of neurology, neurosurgery, intensive care, psychiatry and anesthesiology.

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An evident advantage of the 133-Xe inhalation technique is the possibility of measuring noninvasively a physiological parameter of brain function before, during and after therapeutic intervention. The noninvasive tracer administration – combined with the low radiation dosage and easy procedure – makes this low cost technique ideal for serial follow-up CBF determinations.

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- evaluation of surgically amenable functional pathology.
- assessment of haemodynamic status and recovery before, during and after endarterectomy or bypass surgery.
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- monitoring vasodilator responsiveness, autoregulation and cerebrovascular functional capacity in patients with CVD.

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- differential diagnosis of dementia and depression.

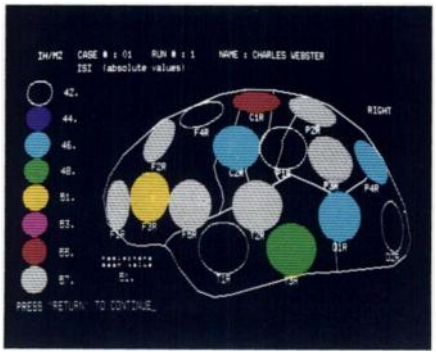
The Novo Cerebrograph® 10a

A compact, fully mobile, 10 detector, bedside monitor, using the IV and IA 133- Xe injection technique.

The Novo Cerebrograph® 32c

A sophisticated system for rCBF measurements with a choice of three 133-Xe administration techniques: Inhalation, IV or IA injection.

For further information please contact:



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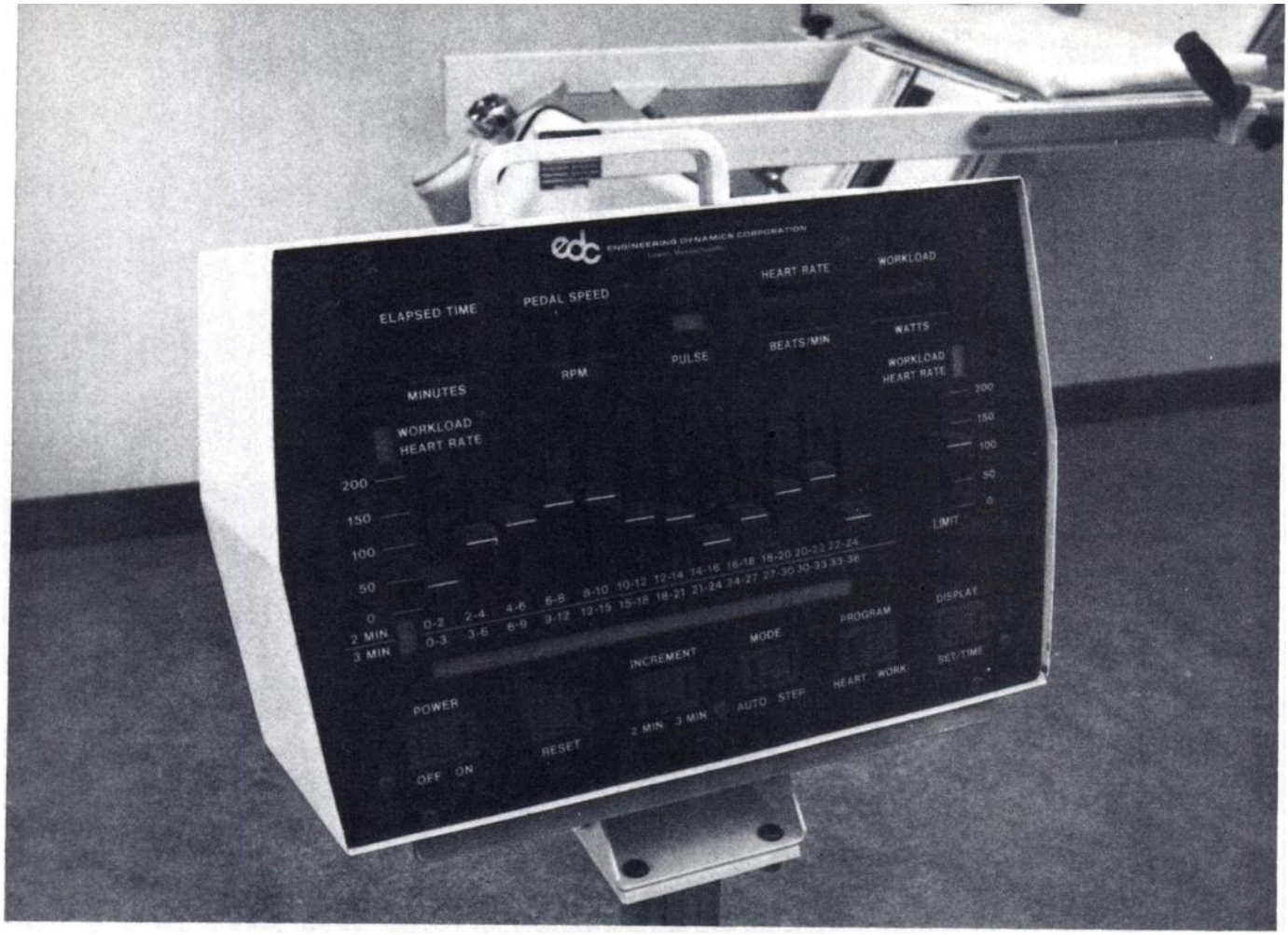
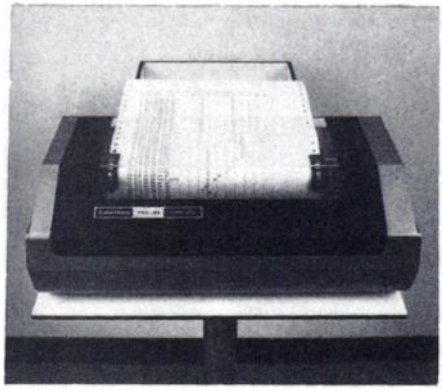


The Ultimate Cardiac Stress System.

Designed to put more muscle into your Cardiac Testing.

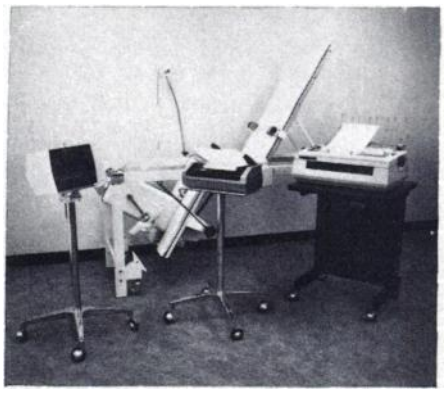
Introducing the most advanced cardiac stress system — the EDC Model 8450. Now you can program any protocol in seconds — either workload or heart rate — right at the front panel by a mere touch of the programmer.



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.

These three new advances have been added to the already well accepted features of our classic model 8430, with its ability to be used either as a stress testing table or as a general imaging table — its fully adjustable table and ergometer — its clear, error-proof, digital readouts — its sturdy construction — and all the other excellent features that nuclear cardiology has come to expect from EDC.

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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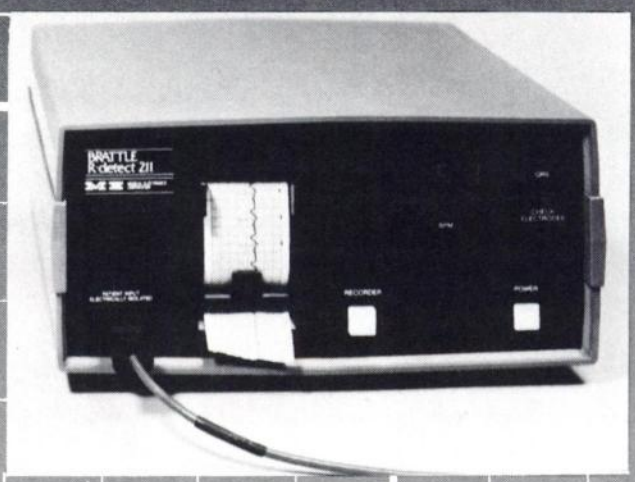
*Not available in U.S.A.

YOU DON'T HAVE TO KEEP YOUR FINGER ON THE TRIGGER!!

The BRATTLE R-DETECT automatically adjusts the threshold level . . . there is *no* manual setting needed.

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.

Special Features

- Fully automatic threshold
- Only two electrodes
- High heartrate capability . . . ideal for stress testing
- Selectable PVC rejection
- Digital heartrate readout
- Pacemaker pulse rejection
- Flashing LED indicates QRS
- LED indicates faulty electrode connections
- Analog ECG output
- Compatible with all nuclear medicine computers
- Stripchart with EKG and R-DETECT event marker (model 211 only)

ME

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Brattle Instrument Division
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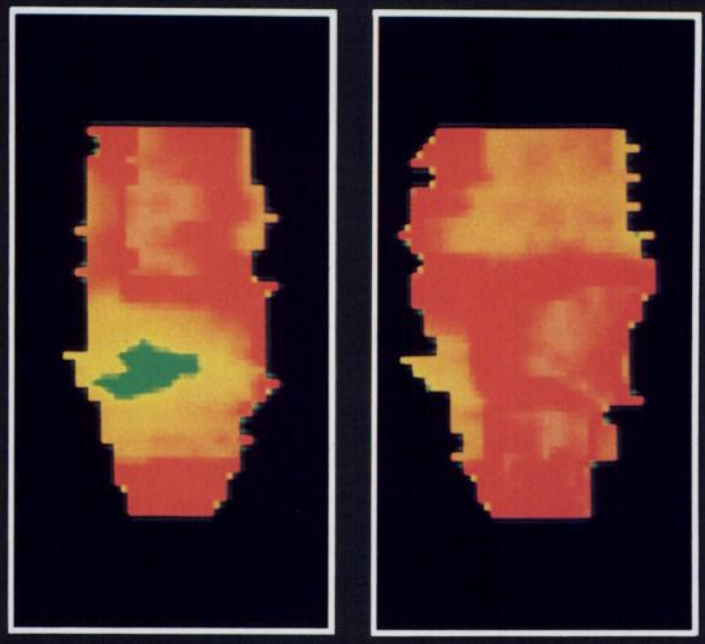

Anterior view, mid-LAD occlusion

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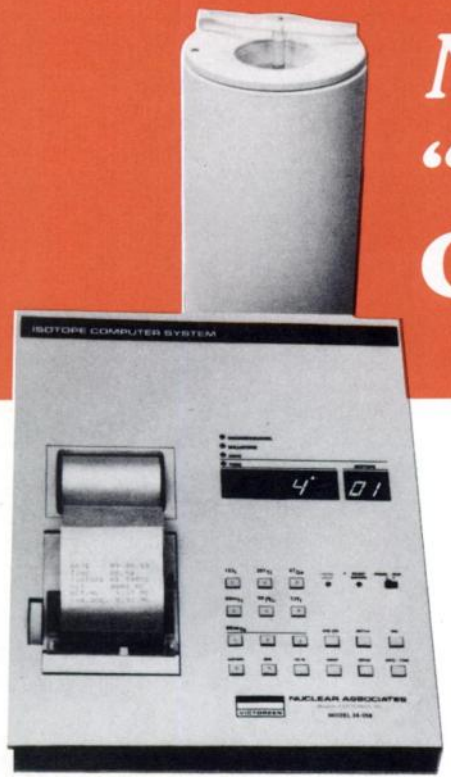

Provides rapid, reliable determination of radioisotope activity and concentration for permanent record-keeping

- **Calculates activity, activity/ml and syringe volume.**
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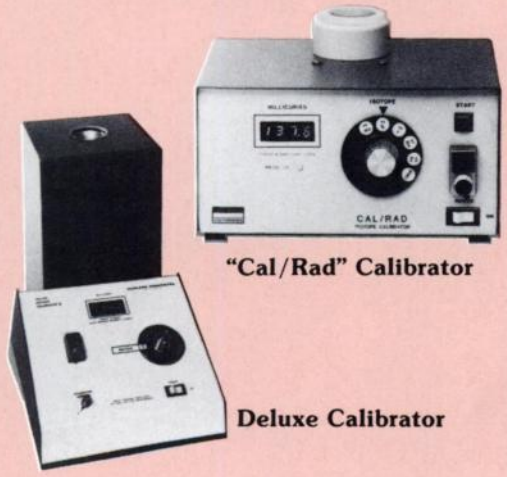

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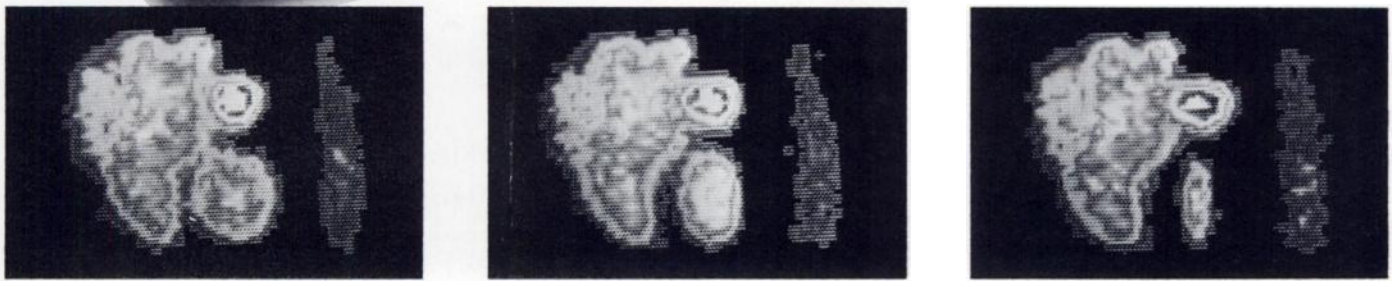

← End diastole

End systole →

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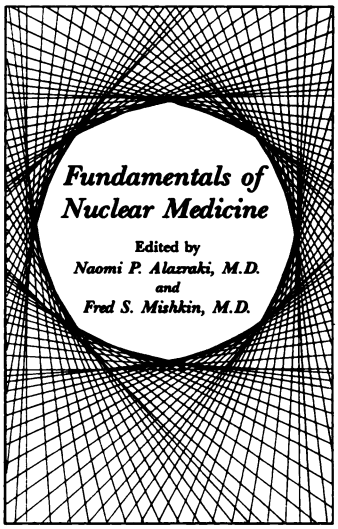

Edited by
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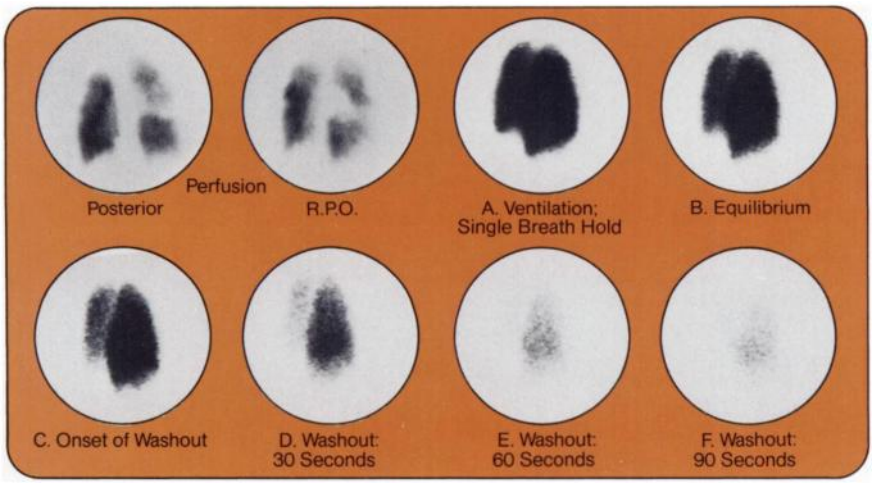
Lung Perfusion Study with Technetium Tc 99m Albumin Aggregated (MAA) and Ventilation Study with Xenon Xe 127 Gas



Patient:
A 26-year old male paraplegic with recent history of chest pain.

Perfusion Study:
3.0 mCi Technetium Tc 99m MAA.

Interpretation: Perfusion defect in superior segment of lower right lobe; smaller perfusion defects noted in left mid-lung and left upper lung field.

Ventilation Study:
5.0 mCi Xenon Xe 127 Gas. Performed immediately after perfusion study with patient in right posterior oblique position.

Interpretation: Xenon Xe 127 Gas uniformly distributed in both lungs; normal clearance and washout (Scintiphotos A-F). Specifically, the area of the perfusion defect demonstrates normal ventilation.

Conclusion:
Probable pulmonary embolism.

Case study and scintiphotos courtesy of Section of Nuclear Medicine, Bowman Gray School of Medicine, Winston-Salem, N.C.

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Please see next page for Xenon 127 prescribing information.

XENON Xe 127 GAS

Diagnostic

DESCRIPTION

Xenon Xe 127 Gas is for diagnostic inhalation use only. It is supplied in vials containing either 5 or 10 millicuries of Xenon Xe 127 Gas in 2 milliliters of carrier Xenon and atmospheric air. Xenon-127 is produced by the proton bombardment of Cesium Cs 133. It contains less than 10% Xenon Xe 129m and less than 10% Xenon Xe 131m on date of release with 99% total radioactivity as radioxenon.

Xenon Xe 127 Gas is chemically and physiologically similar to elemental xenon, a non-radioactive gas which is physiologically inert except for anesthetic properties at high doses.

Physical Characteristics

Xenon Xe 127, with a physical half-life of 36.41 days[1] decays by electron capture to Iodine I 127. Photons that are useful for detection and imaging studies are listed in Table 1.

Table 1. Principal Radiation Emission Data of Xenon Xe 127

Radiation	*Mean Percent Per Disintegration*	*Energy (keV)*
Gamma-2	4.2	145.2
Gamma-3	24.7	172.1
Gamma-4	68.1	202.8
Gamma-5	17.4	375.9
K x-rays	87.9	Mean: 29.7

Xenon Xe 129m, with a physical half-life of 8.89 days[2] decays by isomeric transistion to Xenon Xe 129. The principal photons are listed in Table 2.

Table 2. Principal Radiation Emission Data of Xenon Xe 129m.

Radiation	*Mean Percent Per Disintegration*	*Energy (keV)*
Gamma-1	7.5	39.6
Gamma-2	4.7	196.6
K x-rays	126.9	Mean: 30.4

Xenon Xe 131m, with a physical half-life of 11.84 days[2] decays by isomeric transition to Xenon Xe 131. The principal photons are listed in Table 3.

Table 3. Principal Radiation Emission Data of Xenon Xe 131m.

Radiation	*Mean Percent Per Disintegration*	*Energy (keV)*
Gamma-1	2.0	163.9
K x-rays	54.4	Mean: 30.4

External Radiation

The specific gamma ray constant for Xenon Xe 127 is 2.2 R/mCi-hr at 1 cm. The first half-value thickness of lead (Pb) is 0.023 cm.

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 4. For example, the use of 1.7 cm of Pb will decrease the external radiation exposure by a factor of about 1000.

Table 4. Radiation Attenuation by Lead Shielding

Shield Thickness (Pb) cm	*Coefficient of Attenuation*
0.023	0.5
0.26	10^{-1}
0.95	10^{-2}
1.7	10^{-3}
2.4	10^{-4}

To correct for physical decay of this radionuclide, the fractions that remain at selected time intervals after the day of calibration are shown in Table 5.

Table 5. Physical Decay Chart; Xenon Xe 127, Half-Life 36.41 Days[3]

Days	*Fraction Remaining*	*Days*	*Fraction Remaining*
0*	1.000	20	0.683
1	0.981	22	0.658
2	0.963	24	0.634
3	0.945	26	0.610
4	0.927	28	0.587
5	0.909	30	0.565
6	0.892	32	0.544
7	0.875	34	0.524
8	0.859	36	0.504
10	0.827	38	0.485
12	0.796	40	0.467
14	0.766	45	0.425
16	0.737	50	0.386
18	0.710		

*Calibration day

CLINICAL PHARMACOLOGY

Xenon Xe 127 (and other radioxenons) is a readily diffusible gas which is neither utilized nor produced by the body. It passes through cell membranes, freely exchanges between blood and tissue, and tends to concentrate more in body fat than in blood, plasma, water or protein solutions. In the concentrations recommended for diagnostic studies, it is physiologically inactive. Inhaled **Xenon Xe 127** gas will enter the alveolar wall and enter the pulmonary venous circulation via capillaries. Most of the **Xenon Xe 127** gas that enters the circulation from a single breath is returned to the lungs and exhaled after a single pass through the peripheral circulation.

INDICATIONS AND USAGE

Xenon Xe 127 gas has been shown to be valuable for diagnostic inhalation studies for the evaluation of pulmonary function and for imaging the lungs.

CONTRAINDICATIONS

None known.

WARNINGS

Xenon Xe 127 gas delivery systems, i.e., respirators or spirometers, and associated tubing assemblies must be leakproof to avoid loss of radioactivity into the laboratory environs not specifically protected by exhaust systems.

Xenon Xe 127 gas adheres to some plastics and rubber and should not be allowed to stand in tubing or respirator containers. Loss of radioactivity due to such adherence may render the study non-diagnostic.

PRECAUTIONS

General

Xenon Xe 127 gas 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.

The higher energy and long half-life of Xenon Xe 127 may complicate disposal after use. Exhaled **Xenon Xe 127** gas should be controlled in a manner that is in compliance with the appropriate regulations of the government agency authorized to license the use of radionuclides.

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, mutagenic potential or whether this drug affects fertility in males or females.

Pregnancy Category C

Animal reproduction studies have not been conducted with **Xenon Xe 127** gas. It is also not known whether **Xenon Xe 127** gas can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. **Xenon Xe 127** gas 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

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 **Xenon Xe 127** gas is administered to a nursing woman.

Pediatric Use

Safety and effectiveness in children have not been established.

ADVERSE REACTIONS

None known.

DOSAGE AND ADMINISTRATION

Xenon Xe 127 Gas is administered by inhalation from a closed respirator system or spirometer. The final patient dose should be measured by a suitable radioactivity calibration system immediately prior to administration.

The recommended activity range employed for inhalation by the average patient (70 kg) is:

Pulmonary function including imaging: 5 to 10 millicuries.

This may be administered as a bolus into the tubing near the patient's mouthpiece or mask after the completion of a tidal exhalation or after rebreathing for a period of approximately 5 minutes of the Xenon Xe 127 gas in equilibrium with the air contained in the closed system at concentrations of the radionuclide that may vary from 0.5 to 2.0 millicuries per liter.

Radiation Dosimetry

The estimated absorbed radiation doses to an average patient (70 kg) for inhalation studies from a maximum dose of 10 millicuries of **Xenon Xe 127** in 5, 7.5, and 10 liters of air are shown in Table 6. They are based on 80% total activity as Xenon Xe 127 with 10% activity as Xenon Xe 129m and 10% activity as Xenon Xe 131m. The values are the maximum absorbed dose that could be anticipated under the given conditions.

Table 6. Radiation Dose Estimates of Xenon Xe 127:[4] Absorbed Dose/10mCi Xenon Xe 127 Administered by Inhalation

Tissue	*Spirometer Volume (liters)*		
	5.0	*7.5*	*10.0*
	Rad/10mCi Xenon Xe 127[5]		
Lung	0.064	0.048	0.038
Red Marrow	0.015	0.013	0.010
Ovaries	0.014	0.011	0.008
Testes	0.011	0.009	0.007
Total Body	0.014	0.011	0.008

Directions for Dispensing

Transfer the appropriate Xenon Xe 127 Gas dose from the Xenon Xe 127 Gas unit dose vial(s) to the breathing device or spirometer using an adequately shielded transfer device such as the Mallinckrodt, Inc. Xenomatic II™ Xenon Gas Dispenser, Catalog No. 036. Directions for use of this gas dispenser are as follows:

1. If required, attach needle or other appropriate connector[6] to the Luer-Lok fitting of the Xenomatic II Xenon Gas Dispenser.
2. Remove lead filled plastic cap from Xenon Xe 127 Gas unit dose shield to expose the top of the 2.0 milliliter vial.
3. With vial in shield, insert into handle of the Xenomatic II Xenon Gas Dispenser, impaling the vial on the needles and engaging the latch holding the shield and vial in position.
4. Connect the Xenomatic II Xenon Gas Dispenser to the breathing device or spirometer.
5. Squeeze the trigger *firmly and completely* one or more times to transfer the gas from the vial into the breathing device.[7]
6. After transfer, press shield release latch in the handle and remove the shield.
7. Pull the exhausted vial from the needles, place back into shield, replace plastic cap, and discard in compliance with established requirements for the disposal of radioactive waste.
8. Place an empty shield into the handle of the Xenomatic II Gas Dispenser, engaging the latch. This will prevent possible injury from unprotected impaling needles.
9. To clean the Xenomatic II Xenon Gas Dispenser, simply wipe with mild detergent. DO NOT IMMERSE IN WATER.

Xenon Xe 127 Gas should not be used after 120 days from the date of calibration stated on the label.

Radioactivity Measurements

Calibrate a suitable commercial ionization chamber dose calibrator according to the manufacturer's instructions for that particular instrument. An instrument that gives direct radioactivity readouts is recommended.

Use a National Bureau of Standards (NBS) Xenon Xe 127 standard (or a standard that is traceable to an NBS standard) for the initial calibration. Also establish a secondary standard, such as Barium Ba 133, at that time for subsequent routine use. Other suitable radionuclides may also be used. Determine the effective readout of the secondary standard compared to the Xenon Xe 127 standard over the range of activities expected for routine measurements. Determine the radioactivity of the dose for administration as follows:

1. Check the dose calibrator for proper response with the secondary standard.
2. Insert the Xenon Xe 127 Gas unit dose vial in the dose calibrator and measure the apparent radioactivity of the Xenon Xe 127.
3. Correct for decay as necessary.

The radioactivity determined by this method is within 25% of the true value. This degree of accuracy includes variations attributed to small differences in geometry.

HOW SUPPLIED

Xenon Xe 127 Gas is available in 2ml vials with color-coded labels in 5 millicurie (Code 130) and 10 millicurie (Code 131) sizes. Both sizes are packaged in individual lead shields.

Storage

Xenon Xe 127 Gas should be stored at 15°C to 30°C.

Storage and disposal of **Xenon Xe 127** Gas should be controlled in a manner that is in compliance with the appropriate regulations of the government agency authorized to license the use of this radionuclide.

[1] Atkins, Harold L., et al., *Estimates of Radiation Absorbed Doses from Radioxenons in Lung Imaging*, Task Group of the Medical Internal Radiation Dose Committee, Society of Nuclear Medicine, J. Nucl. Med. 21:459-465, 1980.

[2] Kocher, David C., Radioactive Decay Data Tables, DOE/TIC-11026, 128-134 (1981.)

[3] Preparations of Xenon Xe 127 Gas may contain up to 10% of Xenon Xe 129m and up to 10% Xenon Xe 131m which will slightly reduce the fraction remaining.

[4] Atkins, Harold L., et al., *Estimates of Radiation Absorbed Doses from Radioxenons in Lung Imaging*, Task Group of the Medical Internal Radiation Dose Committee, Society of Nuclear Medicine, J. Nucl. Med., 21:459-465, 1980.

[5] Values based on 80% total activity as Xenon Xe 127 with 10% activity as Xenon Xe 129m and 10% activity as Xenon Xe 131m.

[6] An adaptor is available from Mallinckrodt for use with breathing devices or spirometers that have a recessed xenon injection port.

[7] One complete squeeze of the trigger delivers 99+% of the available Xenon Xe 127 gas from the vial.

REFERENCES

1. Coates G, Nahmias C: Xenon-127, A Comparison with Xenon-133 for Ventilation Studies. *J Nucl Med* 18:221-225, 1977.

2. Atkins HL, Susskind H, Klopper JF, et al: A Clinical Comparison of Xe-127 and Xe-133 for Ventilation Studies. *J Nucl Med* 18:653-659, 1977.

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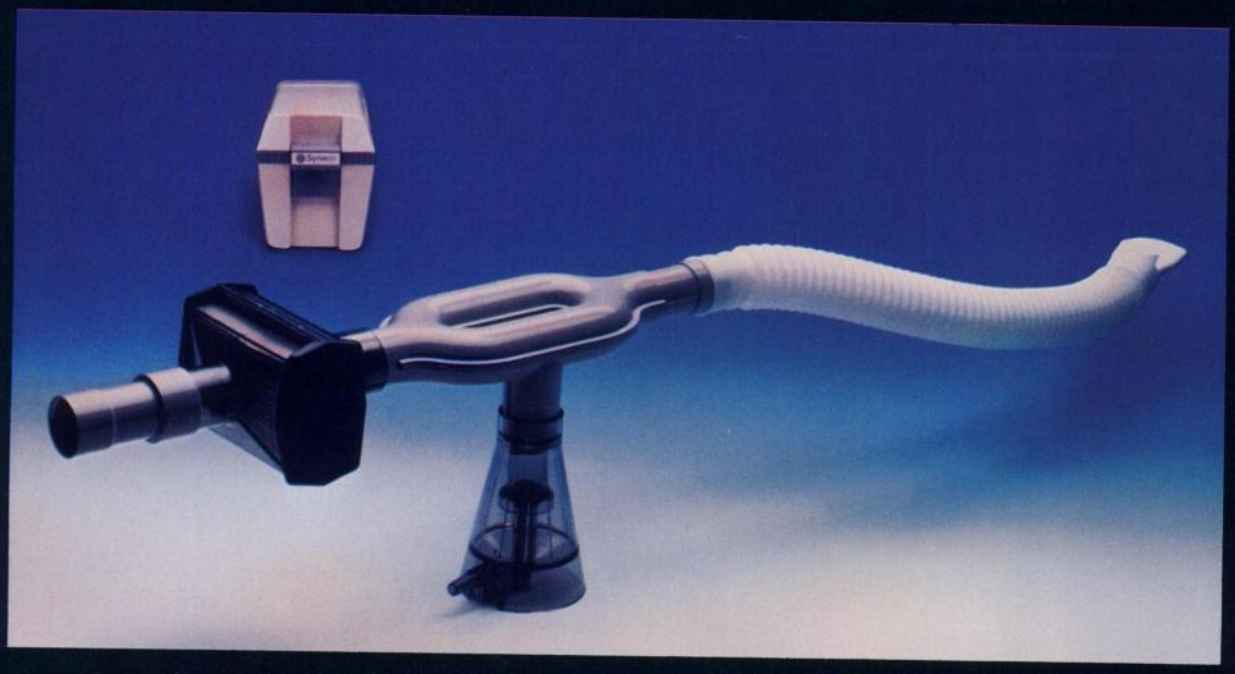

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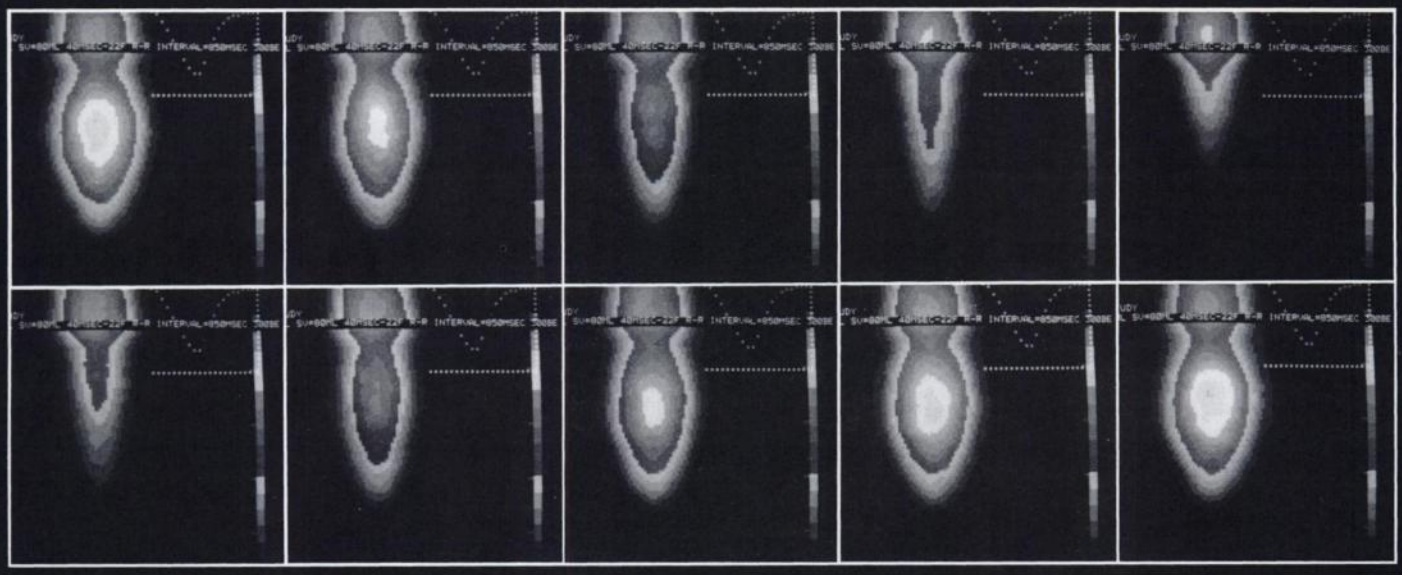

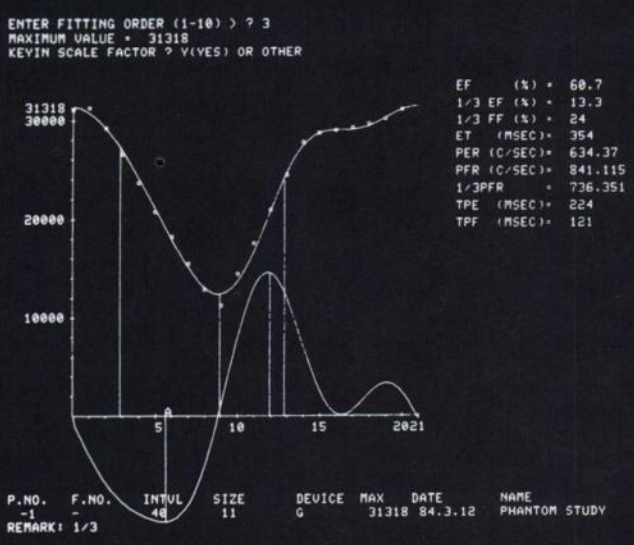

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- Myocardium Phantom
- NMR Phantom

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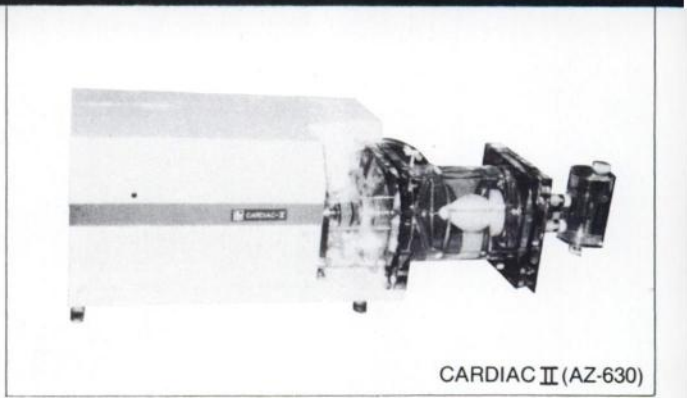

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MEDICAL DEPARTMENT

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15,000 PATIENT STUDIES

Who offers the most clinical experience? You decide. Technicare Teslacon™ MR imaging systems have been used in more than 15,000 clinical patient studies – far more than any other manufacturer. And more imaging protocols have been established on Teslacon systems than any other. That's a patient data base you can count on to provide guidelines for imaging procedures with proven clinical confidence.

Who offers the most clinical experience? The facts speak for themselves. Technicare.

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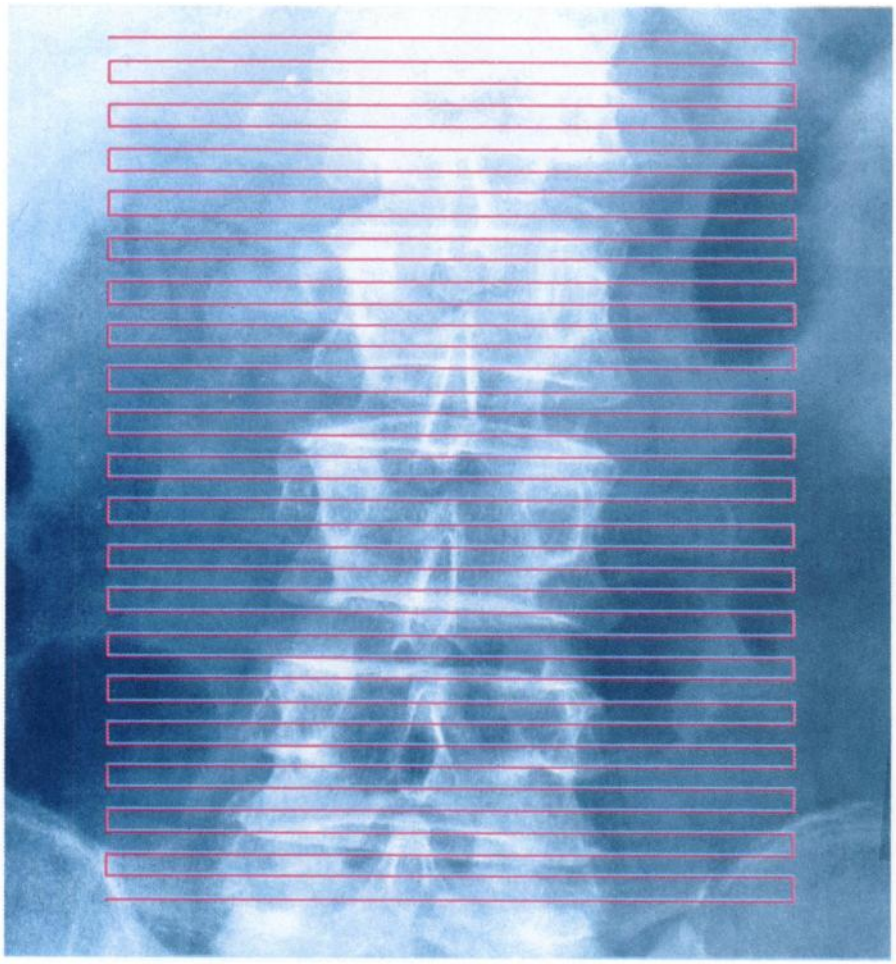
Technicare Corporation, World Headquarters, 29100 Aurora Road, Cleveland, Ohio 44139 U.S.A., (216) 248-1800, Telex: 810-433-2026.

Novo BMC-LAB 22a

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

Postmenopausal Osteoporosis -a cureable disease when treated in time



Early diagnosis of excessive bone mineral loss is possible by noninvasive determination of bone mineral content (BMC) in the axial skeleton.

Reliable Data from Relevant Areas

Loss of bone mineral, and fractures associated with the axial skeleton, are closely associated with metabolic bone disease. Trabecular bone, predominantly present in the axial skeleton, notably the lumbar vertebrae, is affected to a larger extent than cortical bone present in the peripheral skeleton. BMC measurements in potential fracture sites in the axial skeleton provide the most reliable indication of fracture risk.
The Novo BMC-LAB 22a measures BMC in the lumbar spine, the femoral neck and other parts of the skeleton.

Improved Patient Management

A large number of drugs and regimens influence the calcium balance. BMC measurement is a cost-effective and direct means of monitoring patients in haemodialysis, during nutrient supplementation, exercise and drug administration programs.
Ease of operation and low radiation dose make the Novo BMC-LAB 22a ideal for routine monitoring and screening of patients.

Automatic Soft Tissue Compensation

The Novo BMC-LAB 22a is a dual-photon bone densitometer. The technique obviates the need for soft tissue equivalent materials, without sacrificing the excellent precision of the proven single-photon method.

Safety, Flexibility and Ease of Operation

Advanced software guides the user through the measurements and prompts the operator in case of error. Extensive interactive capabilities provide extremely flexible selection of regions of interest.

The Novo BMC-LAB 22a features three dedicated programs: for COLUMNA, and for right and left COLLUM FEMORIS. A fourth OPTIONAL program is included to meet individual requirements.

For further information please contact:

NOVO DIAGNOSTIC SYSTEMS

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Belgium: Novo Industri S.A., Brussels, tlph. 32-2-465-2400
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Holland: Nucletron Trading B.V., Leersum, tlph. 31-3434-5-4224
Switzerland: Nucletron S.A., Lausanne, tlph. 41-2125-2423
France: Semsa, Boulogne, tlph. 33-1-621-6666
Italy: Tecnologie Avanzate, Turin, tlph. 39-11-550284
Japan: Nissei Sangyo Co. Ltd., Tokyo. tlph. 3-504-7111
Korea: Sam Woo Medical Co. Ltd., Seoul, tlph. 568-3166
Australia: Baltek Medical Systems, Berowra Heights, tlph. 2-456-1245

NOVO

3-D VOLUME ACQUISITION

Who's working harder to give you more? Consider this. Technicare's Teslacon™ is the only MR imaging system, commercially available, to offer proven three-dimensional acquisition with physiological gating. That means greater diagnostic flexibility and higher throughput now and in the future.

Who's working harder to give you more? The facts speak for themselves. Technicare.

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CURRENT ISSUES IN NUCLEAR MEDICINE

Making The Case For Nuclear Medicine

The most important instrument in your department may be the telephone. Unless it rings–unless clinicians refer patients for studies–there is no nuclear medicine practice.

Under today's DRG-based payment systems, obtaining and maintaining referrals has become even more important. Hospitals are encouraging their clinicians to minimize the number of tests they order, selecting those that are most definitive, that answer the diagnostic question in the shortest time, at the lowest cost.

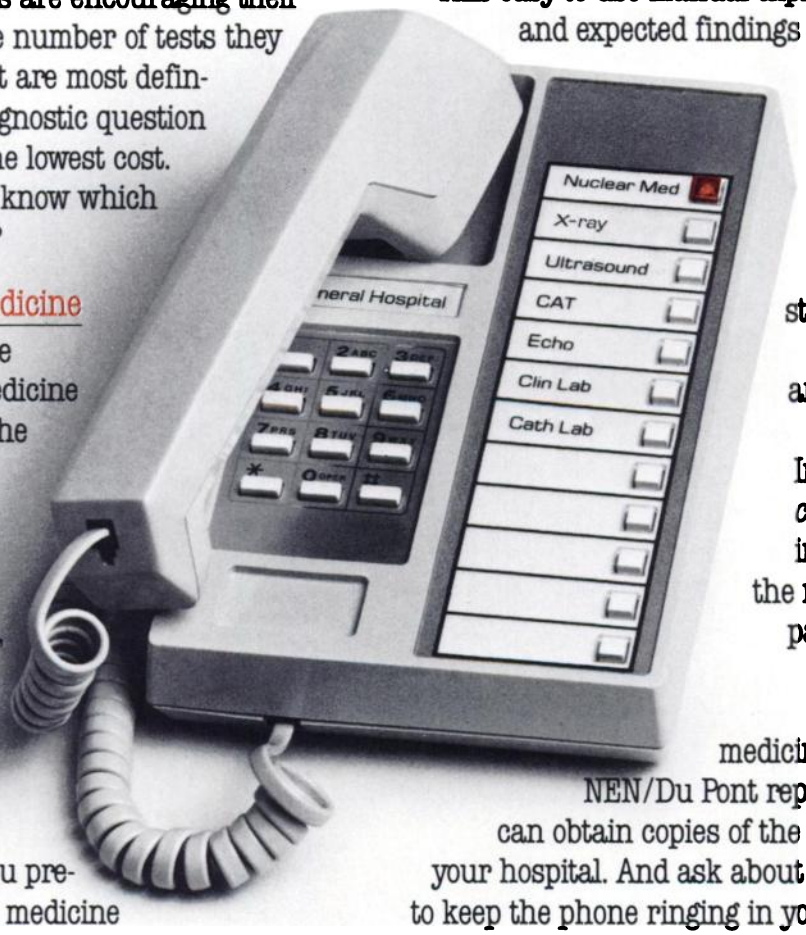
How can clinicians know which tests meet these criteria?

Supporting Nuclear Medicine

At NEN/Du Pont we share your belief in nuclear medicine studies. We understand the contributions these non-invasive studies make to quality medical care. We know which studies can serve as low-cost screens, which can be performed easily on an outpatient basis, which offer physicians the procedure of choice they seek.

And we can help you present the case for nuclear medicine to your administrators and referring clinicians.

For many years, NEN/Du Pont has supported nuclear medicine with teaching programs and exhibits directed to the clinicians who order your studies. Now, we've developed a *Clinician's Guide to Nuclear Medicine Procedures*...to help you build referrals with key clinicians at your institution.



Helping Clinicians Choose

This easy-to-use manual explains the indications and expected findings of nuclear medicine studies, compares them to other diagnostic modalities, and helps referring clinicians select the most appropriate studies. Unnecessary tests are reduced and the patient's stay can be shortened. In addition, the *Clinician's Guide* contains information useful to the nursing staff in preparing and managing patients before and after their nuclear medicine studies. Ask your NEN/Du Pont representative how you can obtain copies of the *Clinician's Guide* for your hospital. And ask about our other programs to keep the phone ringing in your department. Our goal is Imaging Excellence: enhancing the image of your department while improving the images in your department.

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TESLACON

Who's the leader in MR imaging? The results are in. Technicare. With Teslacon,™ the first and only 0.6 tesla whole-body MR imaging system to receive FDA marketing permission. With 38 clinical sites worldwide, over 15,000 patient studies, and high throughput 3-D volume and multi-slice acquisition. And the leadership continues through research into better imaging at current field strengths, contrast enhanced magnetopharmaceutical imaging, spectroscopy, and high field imaging.

Who's the leader in MR imaging? The facts speak for themselves. Technicare.

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

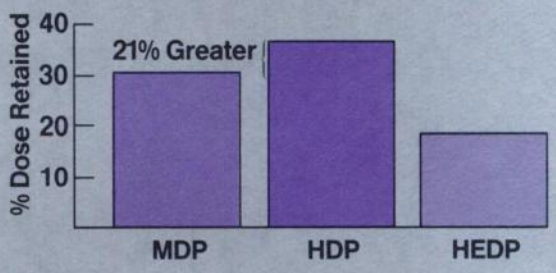
Mallinckrodt
OSTEOSCAN®-HDP
(Technetium Tc 99m Oxidronate Kit)

THE MALLINCKRODT COMMITMENT Mallinckrodt®
to Nuclear Medicine

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

Higher Bone Uptake Than MDP at Two Hours[2]

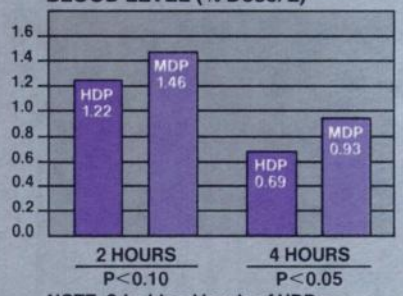
"Image quality is principally related to the absolute retention of the skeletal imaging agent on bone and the time available to allow the soft-tissue tracer component to be excreted by the kidneys."[2] In clinical comparisons,[2] OSTEOSCAN-HDP averaged 21% higher whole body retention than MDP and 99% 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.*

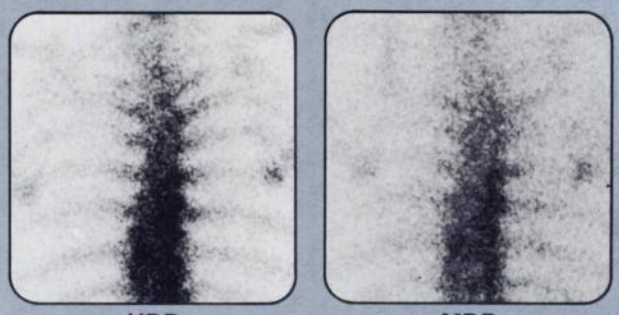
AVERAGE VALUES—10 PATIENTS[5]



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

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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.
3. Cowan RJ, Chilton HM, Ball JD, et al: A comparison of Tc-99m Oxidronate (HDP) and Tc-99m Medronate (MDP) of the detection of skeletal metastases. *Clin Nucl Med* 7:P71, 1982.
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.
5. Littlefield JL, Rudd TG: Tc-99m Hydroxymethylene Diphosphonate and Tc-99m Methylene Diphosphonate: Biological and clinical comparison: Concise communication. *J Nucl Med* 24:463-466, 1983, *Clin Nucl Med* 5:S28, 1980.
6. Silberstein EB: A radiopharmaceutical and clinical comparison of 99mTc-Sn-Hydroxymethylene Diphosphonate with 99mTc-Sn-Hydroxyethylidene Diphosphonate. *Radiol* 136:747-751, 1980.
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®

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

Mallinckrodt
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.

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

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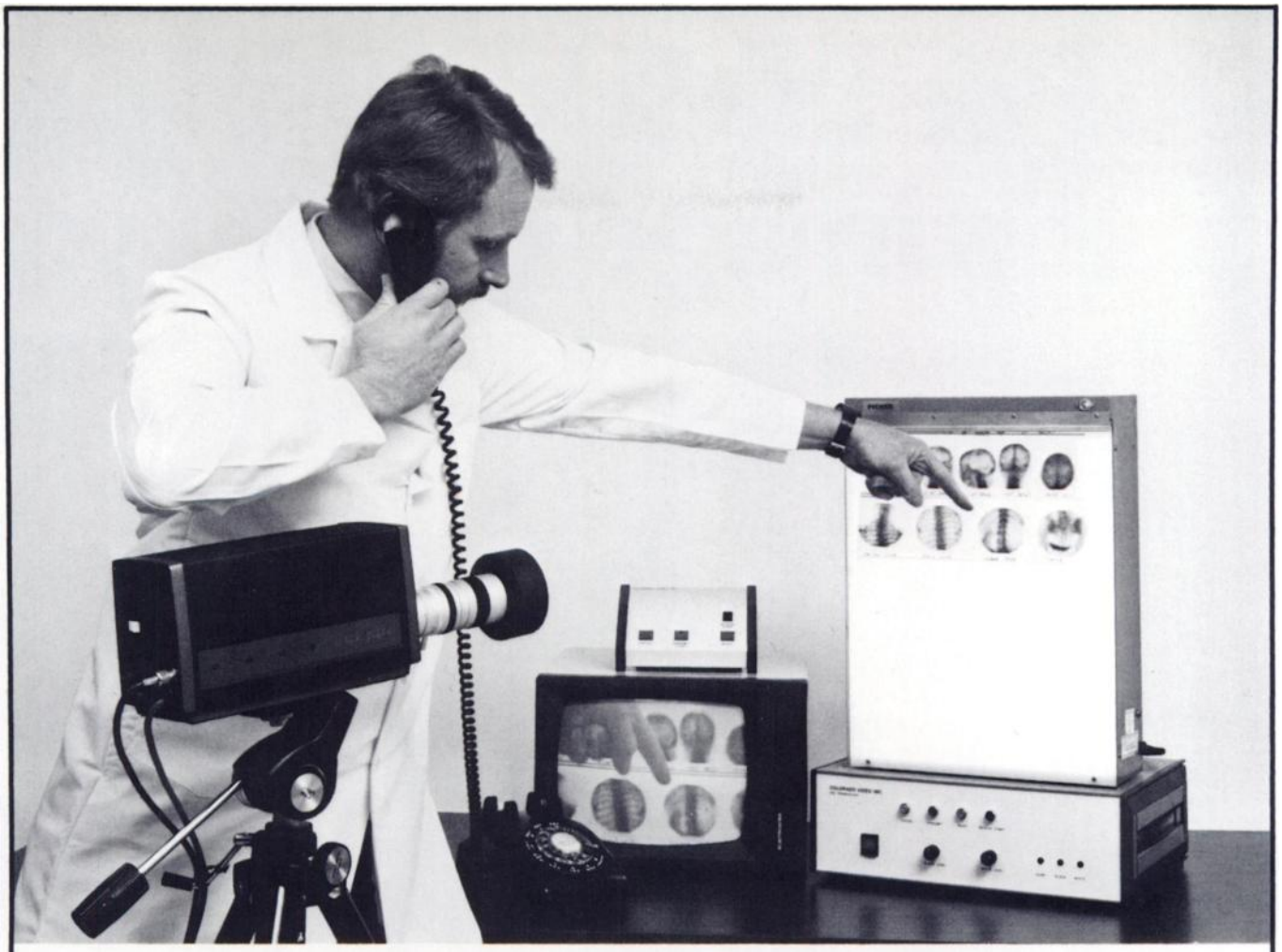

TELERADIOLOGY

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.

Whether used for on-call emergency duty or providing services to multiple locations, Colorado Video equipment provides reliable and efficient delivery of X-rays, CT, nuclear or ultrasound scans with the detail needed to make preliminary diagnoses.

Portable units -- durable and easy to use -- travel nearly anywhere and connect to a telephone jack and a power source.

Colorado Video has been helping medical imaging professionals increase the efficiency of their work through the use of teleradiology. Call us to learn how visual communications delivered by telephone can help you and your institution.

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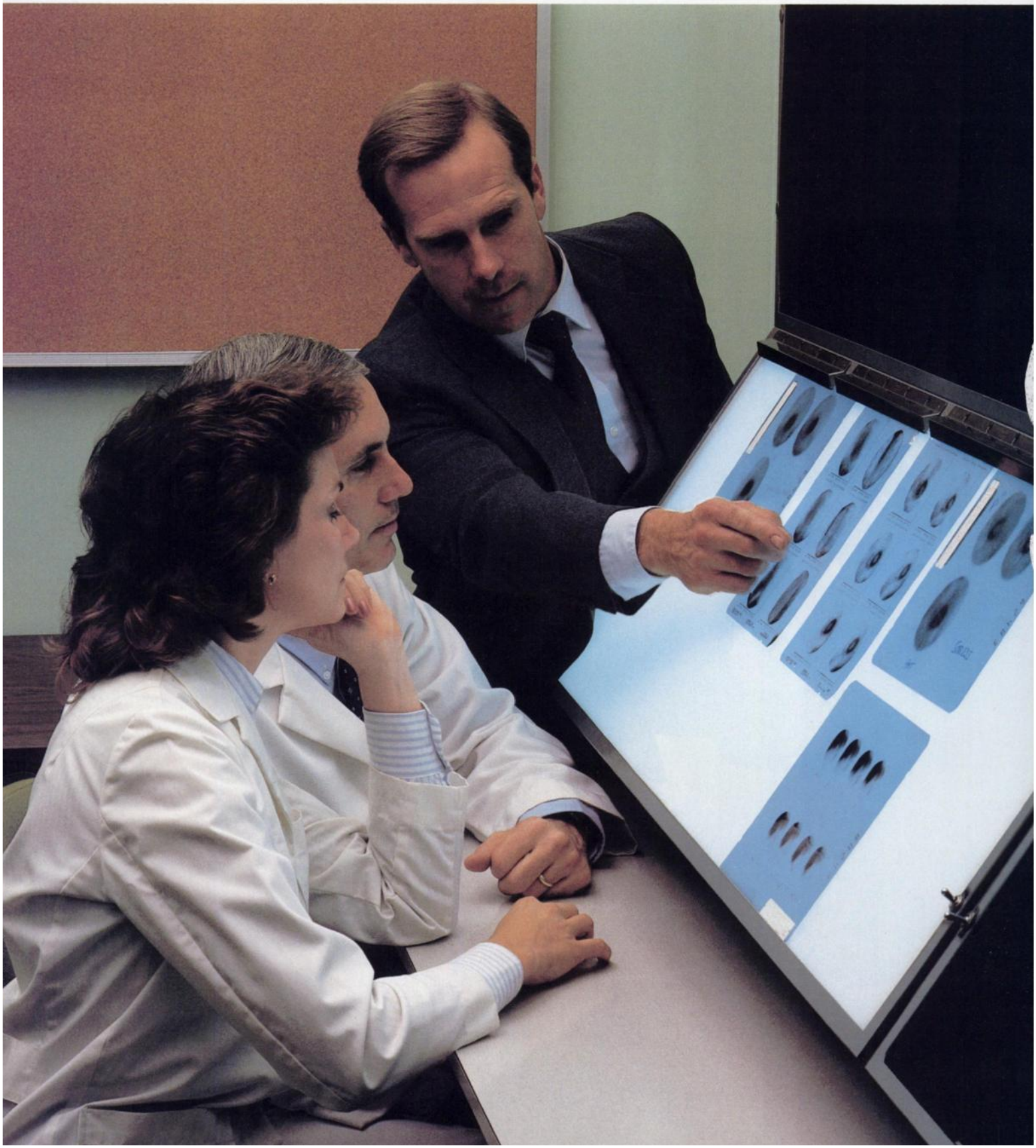

Specialists: Giving you want, time after time.

To help you cope with the imaging revolution, Du Pont developed special films that faithfully reproduce CRT images. Just as important, we trained over 100 specialists in the CRT imaging expertise you need. No other company has anywhere near as many.

We schooled our specialists in delivering the hard copy quality you want—time after time, no matter what the modality.

Here's what our Video Imaging Specialists are well-prepared to do when you use Du Pont film:

1. Defining the image you want.

Du Pont MRF-31 and MRF-32 are high-contrast, single-emulsion films, providing optimum definition of CRT images.

After discussing the image characteristics you desire, Video Imaging Specialists will review variables that affect image quality and recommend adjustments to give you the image you require.

2. Adjusting your camera.

The next step is adjusting your camera to generate maximum diagnostic information suited to your specific needs. Video Imaging Specialists ensure that the camera/MRF film combination works together to deliver maximum performance.

3. Optimizing your processing conditions.

Du Pont's Video Imaging Specialists analyze processing and establish optimum conditions to assure ongoing consistent image quality.

They'll help you evaluate Du Pont's new high-stability developer (HSD)—designed to give you consistently high-quality results over an extended

period, independent of your processing volume.

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.

The best solution could be a Du Pont MRF Daylight Processing Module: a complete

film-handling and processing system which eliminates the need for a darkroom.

For more information, call (800) 441-3456.*

Let Du Pont show you what a Video Imaging Specialist can do for you. Call our toll-free number. *In Delaware, call (215) 358-3752 collect.

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SIEMENS

Good sound technology versus bells & whistles

Facts, not fads...

We keep tabs on trends, we keep our ears open to your needs and, when a change can make a real difference in the state of your art, we respond with innovation that makes sense.

Changes that make sense... from the world's most experienced camera company.

For 1984, we offer the same high level of performance you've come to depend on...plus interesting changes that make a difference.

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We've added an innovation to our patented ZLC energy resolution system –DIGITRAC™–a microprocessor controlled PMT gain adjustment circuit in the detector that lets you know the precise status of your PMT's at any time. It recursively calibrates the camera for the isotope being imaged. DIGITRAC offers a totally new level of system reliability that can reduce operating expenses and virtually eliminate "down time" because you *know* when to schedule service. DIGITRAC is the innovation that can make nuclear medicine more cost-effective.

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

Planar, whole body and SPECT imaging, in the same room–with a single camera!

Siemens Counterbalance Systems

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

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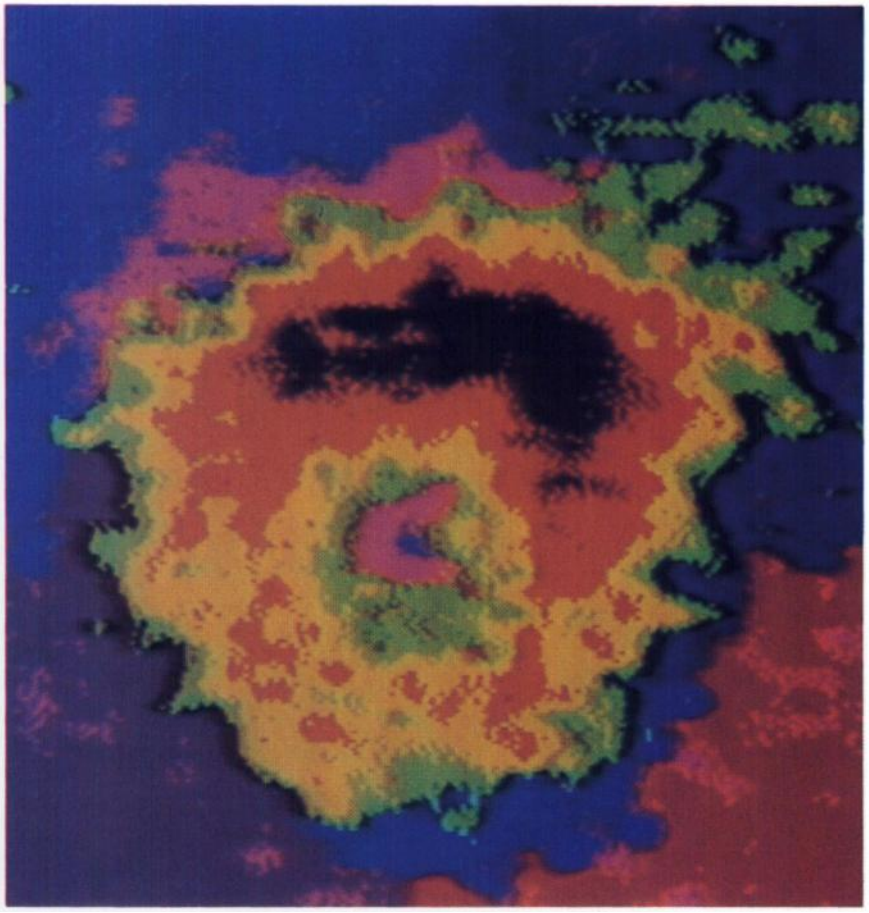
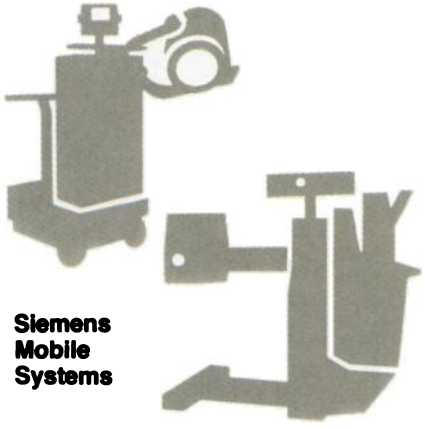
- ECT color monitor available as an option

Siemens ZLC 3700 System with whole body table

- ZLC 3700 camera with ⅜" crystal and DIGITRAC
- New wide aperture saves time in whole body imaging
- Digital Operator Terminal allows push-button set up of study parameters
- Compatible with your computer



How can our new mobile systems expand your referral base?



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.

New ZLC Low Energy Small Area Camera

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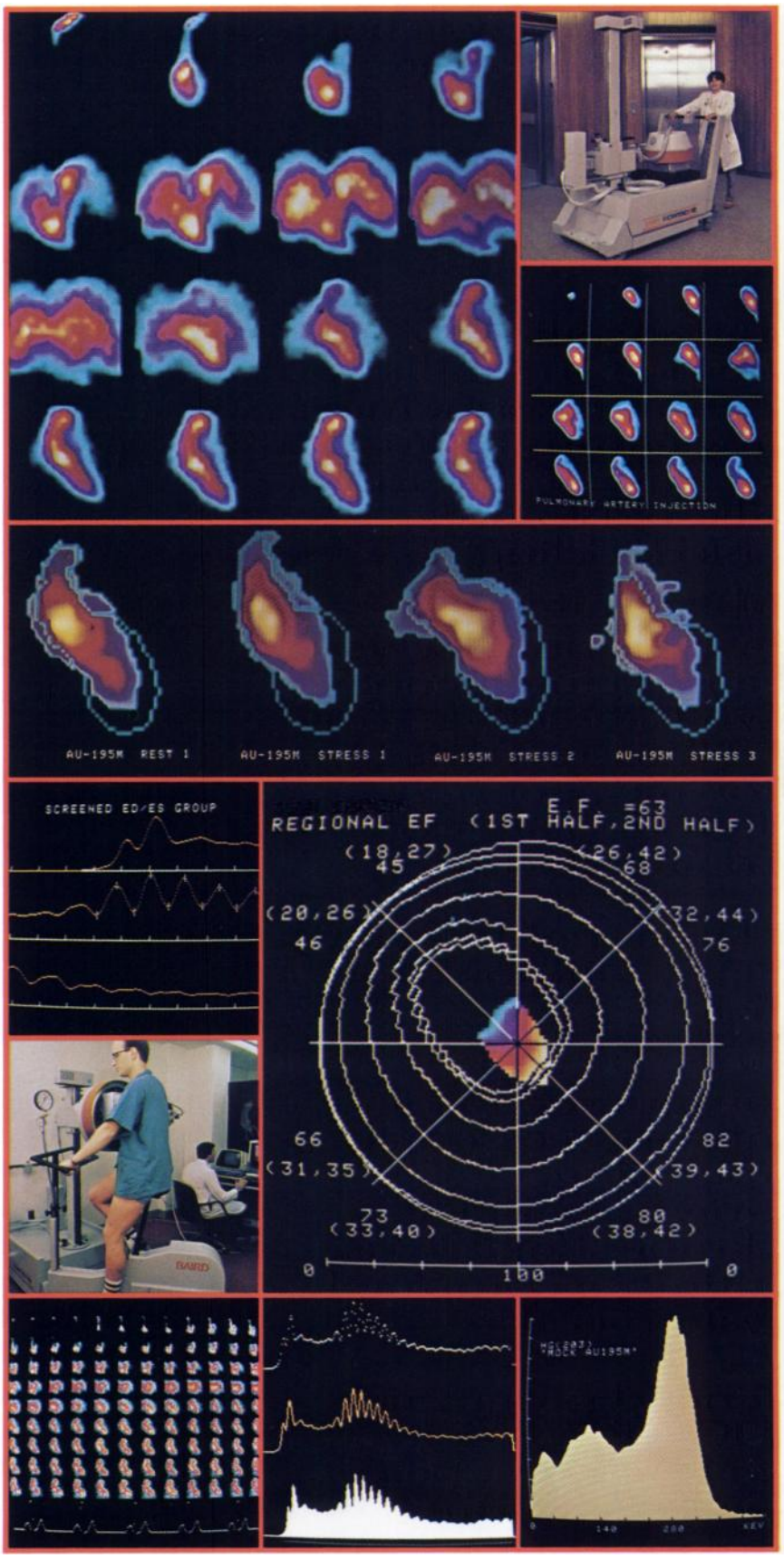
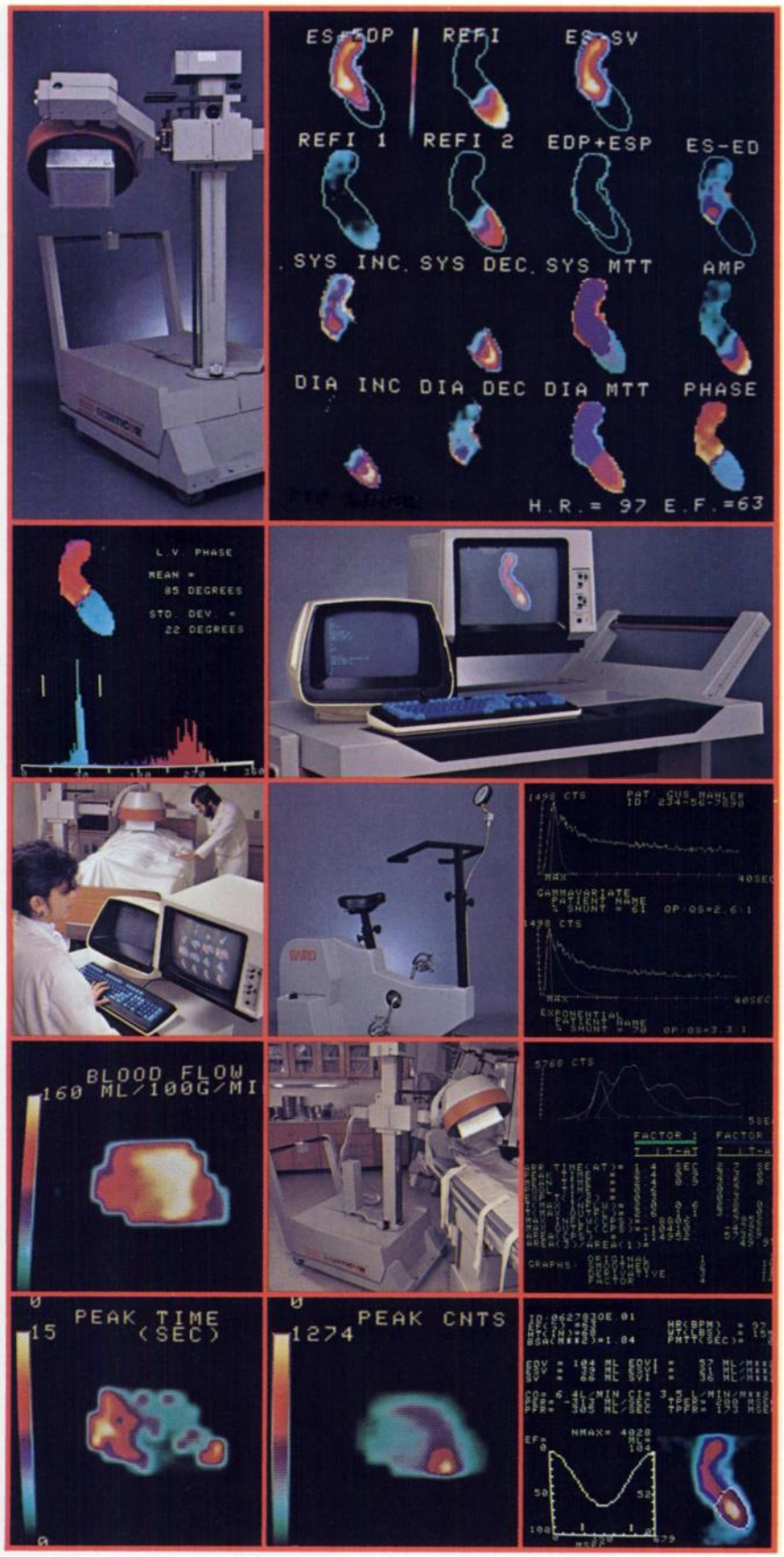


It's not just another pretty image.



And, from acquisition to print out, total processing time is a fraction of any competing nuclear system.

Push us around.

The mobile camera and computer consoles are connected by a high speed fibre optic cable, and may be operated up to 100 meters apart. Measure cardiac function with equal ease at the patient's bedside, in the stress lab, cath lab, ICU, CCU, emergency room or in the nuclear medicine department.

All in all, it's the best nuclear cardiology system ever.

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If you think seeing is believing, you'd better see us at the SNM show, Los Angeles. We'll show you our best nuclear imaging ever. Thanks to a

software based digital self-correction system,* developed for our Omega™ 500 Gamma Camera, that seeks to optimize energy, linearity, and uniformity parameters with virtually no variation regardless of count rate. A system that allows you to easily recalibrate correction values at any time. A system that improves mechanical registration control for better SPECT performance. A system that improves asymmetric windowing. A system, in short, that delivers consistently clearer, sharper images. See us at SNM and see for yourself. We'll open your eyes.

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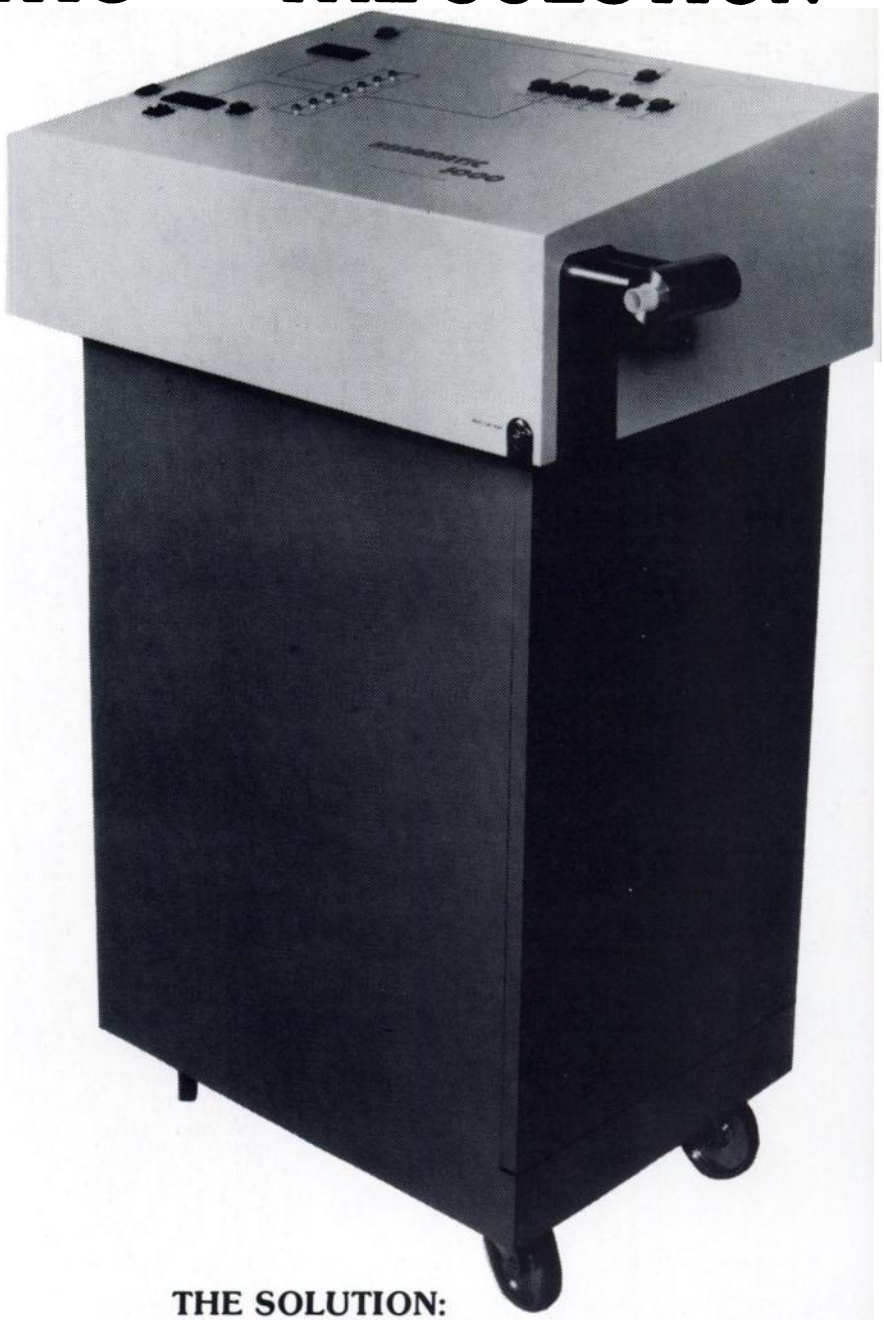
*To be available upon completion of applicable regulatory review.

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.

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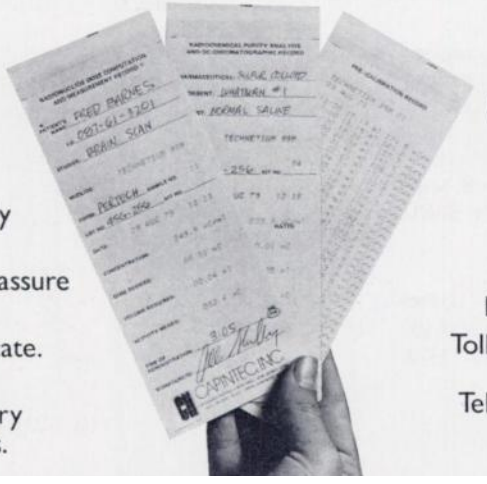

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DIRECTOR, Division of Nuclear Medicine, to direct the clinical and academic activities of nuclear medicine at Columbia-Presbyterian Medical Center in New York City. This 1290-bed tertiary care hospital is the primary teaching facility of the College of Physicians and Surgeons, Columbia University. Over 40 procedures a day of all types are performed. The staff includes 4 full-time physicians, 2 PhDs, 2 nuclear medicine and 2 nuclear cardiology fellows, in addition to rotating residents and a support staff of over 30. Responsibilities include direction of this active clinical program and the nuclear medicine residency training program, as well as guidance of active research programs in radiopharmaceutical develoment, SPECT instrumentation, and other aspects of nuclear medicine. Candidates should have a proven ability to teach the principles and practice of nuclear medicine, as well as experience in nuclear medicine-related research and academic administration. Competitive salary and benefits. Qualified individuals should reply to: David H. Baker, MD, Chairman, Department of Radiology, Columbia-Presbyterian Medical Center, 622 West 168th Street, New York, NY 10032. Affirmative Action/Equal Opportunity Employer.

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.

University College Dublin, FACULTIES OF MEDICINE AND SCIENCE POSTGRADUATE COURSE (1984–85) leading to the degree of Master of Applied Science (M. Appl. Sc.) in nuclear medicine, by examination for medical, pure science and applied science graduates. Subjects covered will include: Radiation Physics, Hospital Nuclear Physics, Statistics, Computing, Anatomy, Biochemistry, Physiology, Radiopathology, Radiopharmacology, Health Physics, Radiobiology, Clinical Nuclear Medicine. Course duration: One academic year beginning 10th October, 1984. Apply to: Faculty of Science Office (Postgraduate Programme), Science Building, University College Dublin, Belfield, Dublin 4, Ireland.

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 601, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

NUCLEAR MEDICINE TECHNOLOGIST. Clinical research position available for an experienced certified Nuclear Medicine Technologist to participate in research utilizing monoclonal antibodies for imaging and therapy of cancer. Knowledge of SPECT and computer desired. Send resume and list of references to: President, Center for Molecular Medicine and Immunology, 100 Bergen St., Newark, NJ 07103. Equal Opportunity/Affirmative Action Employer.

NUCLEAR MEDICINE TECHNOLOGIST. Humana Hospital—Davis North, located in Layton, UT, currently has positions available for registered or registry-eligible Nuclear Medicine Technologists. Experience in CT and radiography desirable but not necessary. Competitive salary and benefits offered. Humana Hospital—Davis North is a progressive community hospital in a suburban area of intermountain west. Close to Salt Lake City, the area offers excellent hunting, boating, fishing, and skiing. For more information, call collect: Rick Davis, Radiology, at (801)825-9561, ext. 7121, or send resume to: Humana Hospital—Davis North, 1600 W. Antelope Drive, Layton, UT 84041. EOE/M/F.

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 600, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

NUCLEAR MEDICINE TECHNOLOGIST (Registered). Position in progressive, private outpatient clinic for experienced Technologist. Position will involve both outpatient clinic and mobile imaging. Excellent opportunity for experienced, self-motivated person. Excellent benefits and salary. Salary growth dependent upon productivity. Please send resume to: Box 602, Society of Nuclear Medicine, 475 Park Avenue South, New York, NY 10016.

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

NUCLEAR & ULTRASOUND SALES. Picker International is expanding its sales force due to the success of our Digital Nuclear Camera and the interest in our new Picker Computer System and Multi Modality Ultrasound Imaging product. Interested persons with clinical/sales experience in nuclear or ultrasound medicine should inquire by mail to: R.A. Dudley, National Sales Manager, Picker International, Nuclear and Ultrasound Division, 12 Clintonville Road, Northford, CT 06472. Stop by our exhibit at the Society of Nuclear Medicine or Spring Diagnostic Meeting in Los Angeles to further investigate opportunities with Picker International.

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.

RADIOLOGIST wanted to join a 7-man private practice group in a 500-bed progressive hospital in suburban New Orleans. Prefer applicant Board certified in Radiology and certified or eligible in Nuclear Medicine. Nuclear Medicine Section is well-equipped with emphasis on Nuclear Cardiology. Please send resume to: A.R. Sandrock, MD, Dept. of Radiology, East Jefferson General Hospital, 4200 Houma Blvd., Metairie, LA 70011.

RESEARCH ASSOCIATE. A full-time and permanent research position is available in an academic research facility. The work is concerned with biochemical research, particularly high pressure liquid chromatography, tissue culture, and the use of radioactive tracer compounds in the study of human purine metabolism. $15,500.00 per year, to start. Requires a PhD in Chemistry. Send resume to: 7310 Woodward Ave., Room 415, Detroit, MI 48202; refer to number 14884. (An employer paid ad).

POSITIONS WANTED

NUCLEAR MEDICINE PHYSICIAN ABR cert., ABNM eligible. 2 yr. nuc. med. completed plus will finish research fellowship 1984. Desires position in Northeast for September '84. Send inquiries to: Box 603, SNM, 475 Park Ave. So., New York, NY 10016.

Young NUCLEAR PHYSICIAN/INTERNIST, ABNM, ABIM with academic and private experience seeks relocation. Reply Box 604, Society of Nuclear Medicine, 475 Park Ave. So., New York, NY 10016.

TECHNOLOGISTS available August, 1984: Graduating from Mayo Foundation, Rochester, MN, four year NMT degree program. Contact: Nancy Hockert, CNMT or Tom Hammell, CNMT, Mayo Foundation, Rochester, MN 55905; (507)284-3055.

FOR SALE

COMPUTERS for sale! Call: (716)648-5544.

MDS A² TRI CAMERA COMPUTER, includes NOVA 4 CPU, three remote memory racks, 5 terminals, 80 MBYTE module, 2.5 MBYTE DIABLO disks, 75 ips tape drive, color, tomo software: $60,000.00 plus freight.

ADAC SYSTEM 3 COMPUTER, includes two terminals each with 265K byte Acq/Proc and 64K byte APU, dual side floppy, two winchesters, 40 MBYTE, 10 MBYTE, color, 6:1 matrix imager: $60,000.00 plus freight.

MDS A² COMPUTER, two acquisition-processing terminals. 80 Mb storage disc, 2 - 2.5 Mb removable discs. Full software. Disc racks included. Excellent condition. Call: Harvey J. Berger, MD; (404)329-4843.

PICKER Magnascanner 500 with rate meter for thyroid uptakes. Four collimators in good condition. $500.00. Call: (304)766-7121.

TOSHIBA Model 2110 Video Interface. Connects any two imaging systems to any multiformat camera. Current cost $995.00. will sell for $495.00. Call: (304)766-7121.

EQUIPMENT WANTED

Used HEWLETT PACKARD DISPLAY UNIT (1331A or 1335A) to use in conjunction with a Picker Dyna Camera 4; (304)766-7121.

NUCLEAR PHARMACY MANAGER
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COLLEGE OF PHARMACY

Applications are invited for the position of Manager of the OUHSC Nuclear Pharmacy. Applicants must possess a degree in pharmacy, have adequate experience and be eligible for licensure in the State of Oklahoma. The primary responsibility of this position is management of the OUHSC Nuclear Pharmacy. In addition, the individual will have responsibility for professional graduate and undergraduate instruction in nuclear pharmacy. An advanced degree and/or prior academic experience is desirable for faculty appointment. Salary will be commensurate with experience. The Nuclear Pharmacy is located in the new College of Pharmacy Building on the University of Oklahoma Health Sciences Center Campus.

Interested applicants should send a letter of application accompanied by a curriculum vitae and names and addresses of three references to the following address by July 1, 1984: J. Thomas Pento, Ph.D., Chair, Search Committee, College of Pharmacy, University of Oklahoma HSC, 1110 N. Stonewall Avenue, Oklahoma City, OK 73190.

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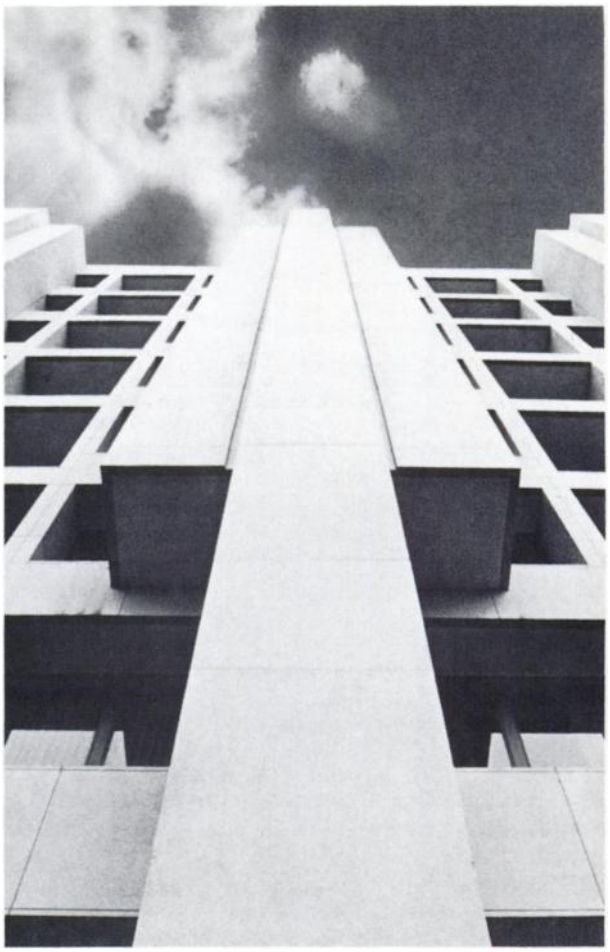
RESIDENCY and FELLOWSHIP PROGRAM
BAYLOR COLLEGE OF MEDICINE
NUCLEAR MEDICINE SECTION

Baylor College of Medicine is now accepting applications for residency and fellowship positions starting July 1984 and July 1985. The residency program includes training in three large nuclear medicine laboratories: St. Luke's Episcopal Hospital-Texas Children's Hospital-Texas Heart Institute joint facilities, Ben Taub General Hospital, and Veterans Administration Medical Center.

Residency training encompasses the full spectrum of nuclear medicine procedures, both in vivo and in vitro, in pediatric and adult inpatients and outpatients. Instruction includes clinical nuclear medicine, radiopharmacy, radioimmunoassay, and basic sciences, as well as experience with computer applications and tomographic imaging.

Fellowships with emphasis on cardiac and pulmonary disease are available in association with the Texas Heart Institute. With mobile capabilities and a large population of critically ill patients (total hospital beds, 1260; intensive care beds, 190) there is ample potential for participation in research projects related to cardiovascular, pulmonary, and critical care medicine.

Requests for further information should be directed to:
John A. Burdine, MD, Chief or
Paul H. Murphy, PhD, Training Coordinator
Nuclear Medicine Section, Department of Radiology
Baylor College of Medicine
Houston, TX 77030



Reach new heights as a Nuclear Medicine Technologist at Hermann Hospital.

Located in the heart of Houston's renowned Texas Medical Center, Hermann has achieved an enviable national reputation as a critical care and trauma hospital. As a result, our nuclear medicine technologists have interesting and challenging variety in their work.

Because we're the primary research and teaching hospital for the University of Texas Medical School at Houston, there's a strong emphasis on professional development. That includes an excellent continuing education program offering full tuition reimbursement.

If you're a nuclear medicine technologist with a strong desire to advance professionally, write: Human Resources Department, Hermann Hospital, 1203 Ross Sterling Avenue, Houston, Texas 77030.

Or call collect (713) 797-4473.

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Nuclear Medicine Review—1984

August 27th–30th, 1984
Mount Sinai Medical Center
New York, NY

This course will provide an intense review of nuclear medicine including the basic science of radiation physics, instrumentation, radiochemistry and pharmacy, in vitro and radiobioassay, scintigraphic imaging, radionuclide in vivo function tests and radionuclide therapy. It is a supplement to residency training in Nuclear Medicine and Nuclear Radiology and is not designed to substitute for this type of training. The course may serve as a survey of nuclear medicine science for physicians or others seeking an overview of this subject.

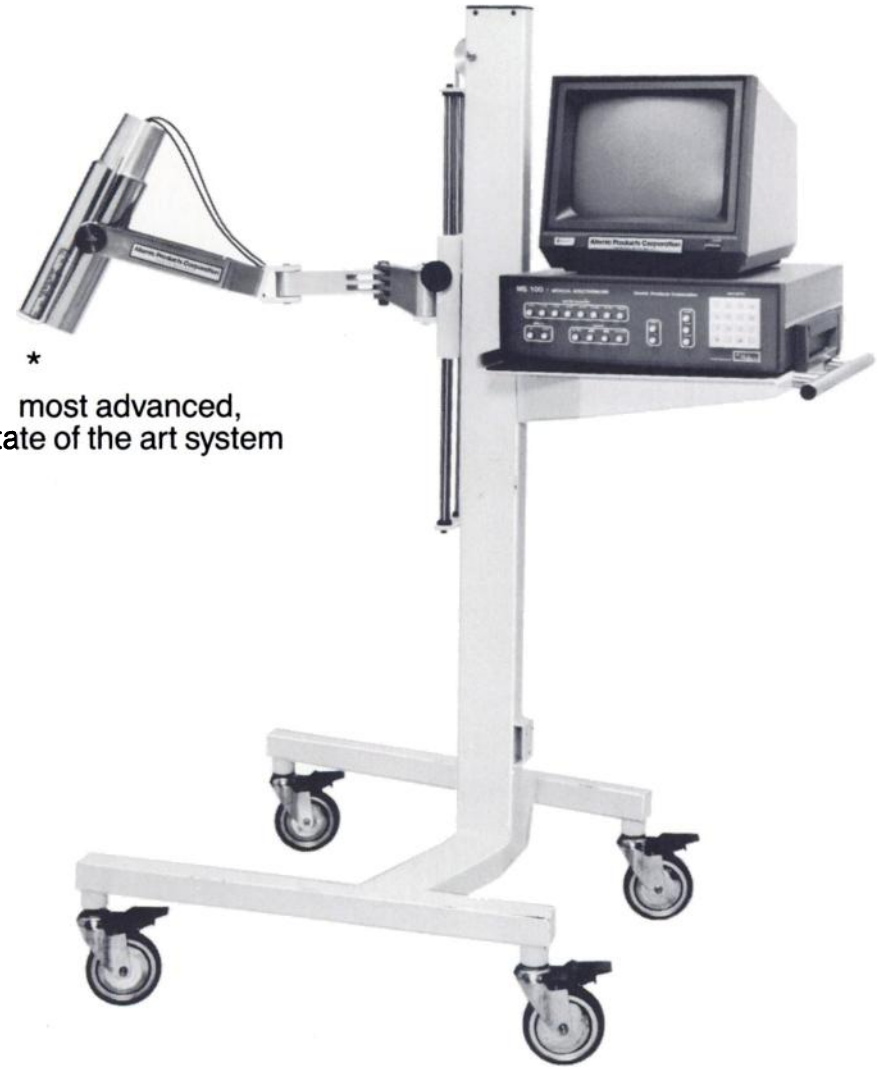
The faculty consists of members of the Andre Meyer Department of Physics-Nuclear Medicine and invited guests.

Course Director: Stanley J. Goldsmith, M.D.

For further information contact: Ms. Mary Farrell-Batista—(212)650-7888.

ATTENTION PLEASE

there's a new* Thyroid Uptake System that makes life easier...for everybody.



* most advanced, state of the art system

with a Multi-Channel Analyzer

Computer programming has been adapted to this new Thyroid Uptake System to simplify a once-complex procedure and increase its accuracy from patient to patient and test to test. The system consists of a new multi-channel analyzer with push button isotope selection, a video display console and an (optional) printer. All components are situated on a functional, versatile, rugged rolling stand to present a compact, mobile system.

FOR COMPLETE INFORMATION WRITE OR CALL—

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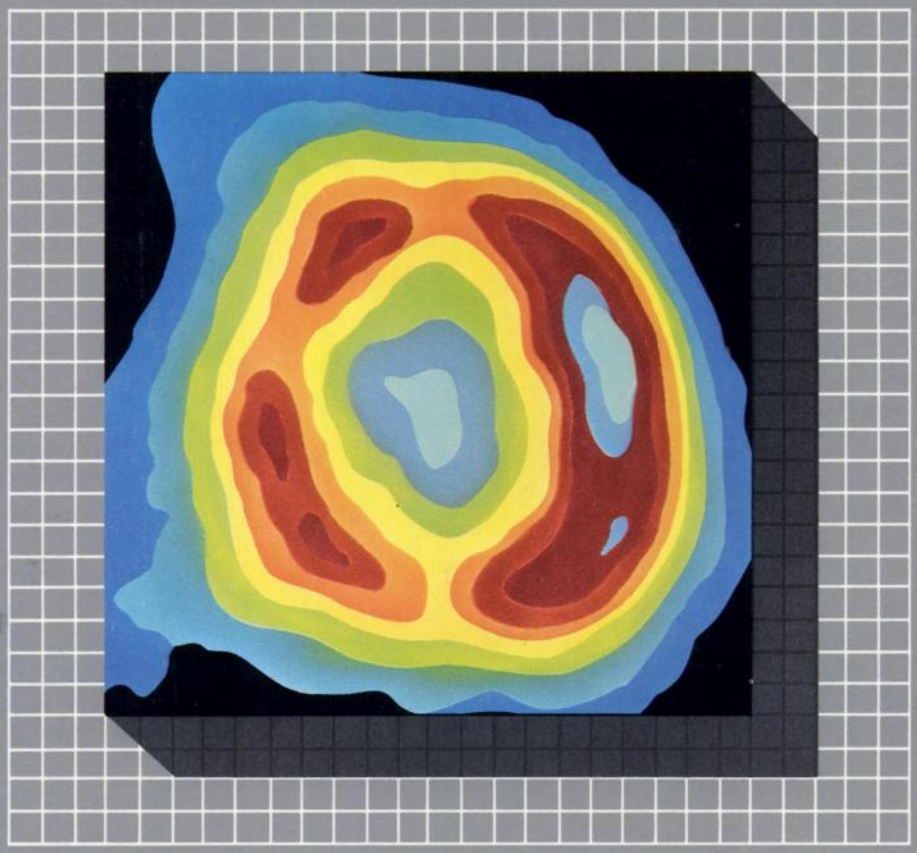
Thallous Chloride Tl 201



For your patients, we have:

- Significantly increased our production to meet your demand . . . *you get WHAT you want . . . WHEN you want it.*
- Coast-to-coast distribution network which also allows you to receive your Thallous Chloride Tl 201 with other MPI products, saving multiple delivery charges.
- Precalibrated Thallium 201 Monday through Friday is now available.*
- Single dose vials for easy record keeping—one vial per patient.
- The most complete line of up-to-date radiopharmaceuticals in the industry.

Take advantage of us. Let MPI be your prime supplier.

*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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