ANNOUNCING

MPI Indium DTPA In 111
(Pentetate Indium Disodium In 111)
In Cisternography

Cisternography presents the dynamics of CSF flow

When you need to know *function*—
cisternography is useful in the evaluation of:

- Patients who may need ventricular shunts
- Shunt patency and/or site of blockage
- Patients with symptoms of "normal pressure" hydrocephalus
- Patients with symptoms of "communicating" hydrocephalus
- CSF rhinorrhea patients

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Tc-DTPA AEROSOL
For Lung Ventilation Studies

Advantages

- Multiple views - to match perfusion
- High resolution
- Portable - can be used with patients on respirator
- Far less radiation dose to lung mucosa
- No capital investment - economical to use
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A - Lead Shield
B - Disposable Aerosol Device

Tc AEROSOL™

A viable alternative to Kr-81m

Clinically superior to Xe-133

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For technical assistance ask for Eph Lieberman

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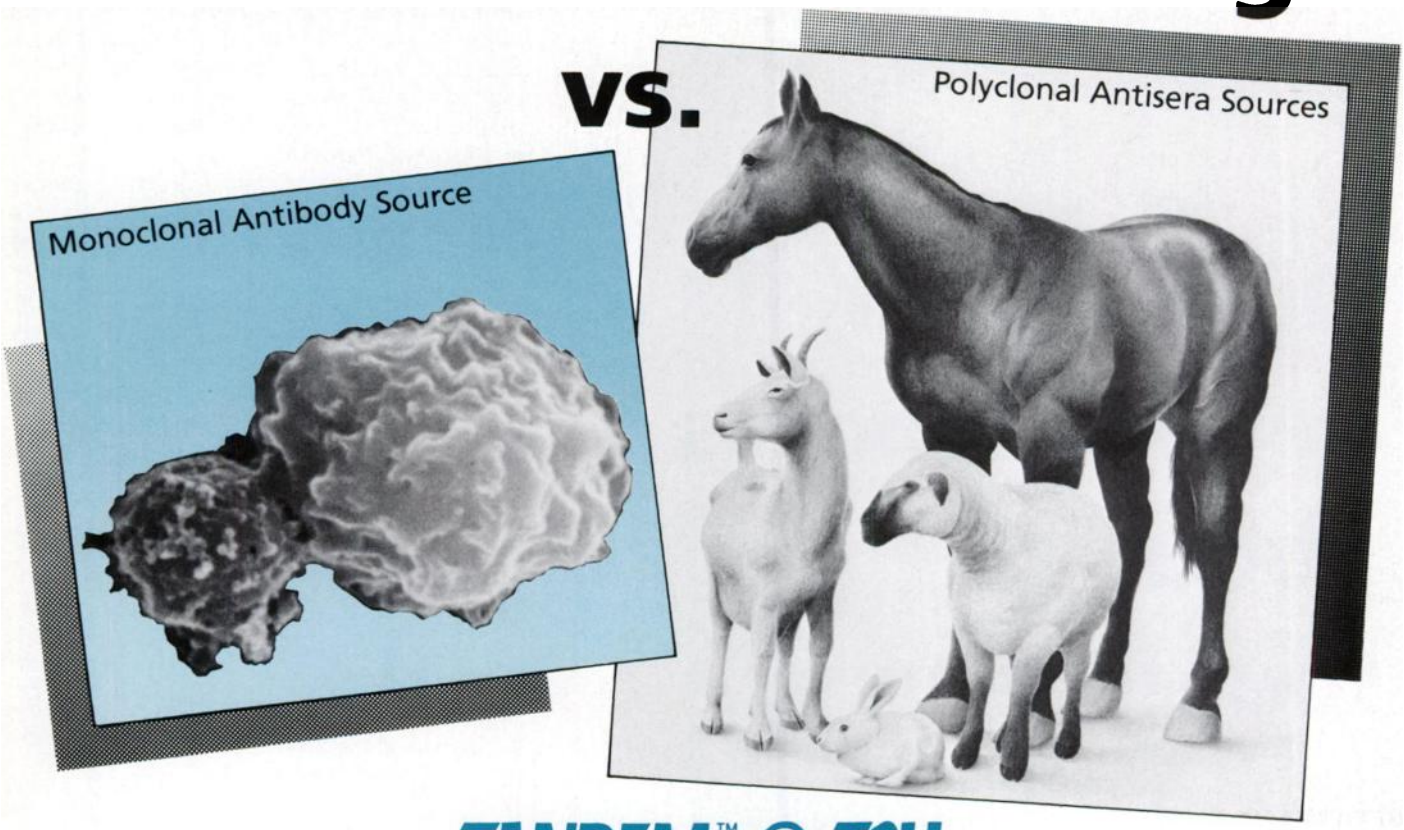
In TSH Testing. It's time for the last change.



TANDEM™-R TSH

Like most laboratories you've probably changed TSH assays several times in the past few years. Chances are you're still not entirely satisfied with the precision and reproducibility of results you're getting.

POLYCLONAL ANTISERUM —THE PROBLEM

We think we know the source of your problem—the polyclonal antiserum used in conventional RIA assays. Cross-reactivity and batch-to-batch variation problems, inherent with traditional TSH assays, compromise the reliability of results—no matter whose kit you use.

MONOCLONAL ANTIBODIES —THE SOLUTION

Now it's time for one last change—to **TANDEM-R TSH.** Monoclonal antibodies used in **TANDEM** are available in unvarying unending supply, eliminating once and for all the potential for batch-to-batch antibody variability. Two *different* monoclonal antibodies in a solid phase two-site IRMA assure *precise* identification of the TSH molecule.

MORE TO OFFER

But consistency is only the beginning. There are other important reasons to consider changing to **TANDEM.**

- ***Precision.***
  TANDEM-R TSH has consistently lower between run percent CV's than leading competitors.
- ***No lipids interference.***
  TANDEM-R TSH eliminates special handling of lipemic samples.
- ***Most sensitive assay available.***
  TANDEM-R TSH measures less than 0.2 μIU/ml.

REVIEW ALL THE REASONS

We want to show you why the time has come to change to **TANDEM-R TSH.** An indepth report is available with facts and figures which will convince you that **TANDEM-R TSH** is an easier, more reliable assay than the one you're currently using.

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CLINICAL CRITERIA

"An ideal radiopharmaceutical for cisternography would satisfy the following criteria: (I) physiologically governed by CSF flow, (II) adequate half-life for desirable period of study, (III) photons suitable for scanning, (IV) low radiation dose, (V) least probable chemical toxicity, and (VI) controlled pharmaceutical quality. Chelated ^{111}In satisfies all these conditions."[1]

COMPARISON OF TWO RADIOPHARMACEUTICALS USED IN EVALUATION OF CEREBROSPINAL FLUID PATHWAYS[2]

	^{169}Yb DTPA	^{111}In DTPA
Physical Half-Life	32 days	2.8 days
Biological Half-Life	12 hours	10 hours
Useful Photons (energy MeV)	0.177, 0.198	0.173, 0.247
Useful Photons (% disintegration)	0.57	1.85
Whole Body Dose	0.069/500 μCi	0.039/500 μCi
Spinal Cord Surface Dose (rads)	8.0/500 μCi*	1.9/500 μCi*

*Dose to spinal cord and brain surface

[1] Chelated ^{111}In: An ideal radiopharmaceutical for cisternography, F. Hosain, D. Phil., and P. Som, D.V.M.M.S. British Journal of Radiology, 45:677-679, Sept. 1972.

[2] Preparation, Physiology and Dosimetry of ^{111}In Labeled Radiopharmaceuticals for Cisternography, David Goodwin, M.D., Chung Hun Song, B.S., Roland Finston, Ph.D. and Philip Matin, M.D., Radiology, 109:91-98, July 1973.

medi+physics™

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Inside California Toll Free (800) 772-2477 • Outside California Toll Free (800) 227-0492.

FOR COMPLETE PRESCRIBING INFORMATION PLEASE CONSULT PACKAGE INSERT, A SUMMARY OF WHICH FOLLOWS:

MPI Indium DTPA In 111

(Pentetate Indium Disodium In 111)

DESCRIPTION: MPI Indium DTPA In 111 is a diagnostic drug for intrathecal use. It is available as a sterile, apyrogenic, isotonic, aqueous solution, buffered to pH 7 to 8. At calibration time each milliliter contains 1 millicurie of Pentetate Indium Disodium In 111 (no-carrier-added), 20 to 50 micrograms of pentetic acid, and sodium bicarbonate for pH adjustment. *The drug is to be discarded after single use.* Radionuclidic purity at calibration time is at least 99.0% with less than 0.1% Indium In 114m and 0.1% Zinc Zn 65. The concentration of each radionuclidic contaminant changes with time. Graph 1 shows maximum concentration of each radionuclidic impurity as a function of time.

INDICATIONS AND USAGE: Pentetate Indium Disodium In 111 is recommended for use in radionuclide cisternography.

CONTRAINDICATIONS: None known.

WARNINGS: The contents of the vial are radioactive. Adequate shielding of the preparation must be maintained at all times.

Since the drug is excreted by the kidneys, caution should be exercised in patients with severely impaired renal function.

PRECAUTIONS:
Pentetate Indium Disodium In 111, as well as other radioactive drugs, must be handled with care and appropriate safety measures should be used to minimize external radiation exposure to clinical personnel, and to minimize radiation exposure to the patients consistent with proper patient management.

Do not use after the expiration time and date (7 days after calibration time) stated on the label.

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

Carcinogenesis, Mutagenesis, Impairment of Fertility

No long-term animal studies have been performed to evaluate carcinogenic potential, or whether Pentetate Indium Disodium In 111 affects fertility in males or females.

Pregnancy Category C

Animal reproductive studies have not been conducted with MPI Indium DTPA In 111. It is also not known whether Pentetate Indium Disodium In 111 can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. Pentetate Indium Disodium In 111 should be given to a pregnant woman only if clearly needed.

PRECAUTIONS: 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 Pentetate Indium Disodium In 111 is administered to a nursing mother.

Pediatric Use

Safety and effectiveness in children have not been established.

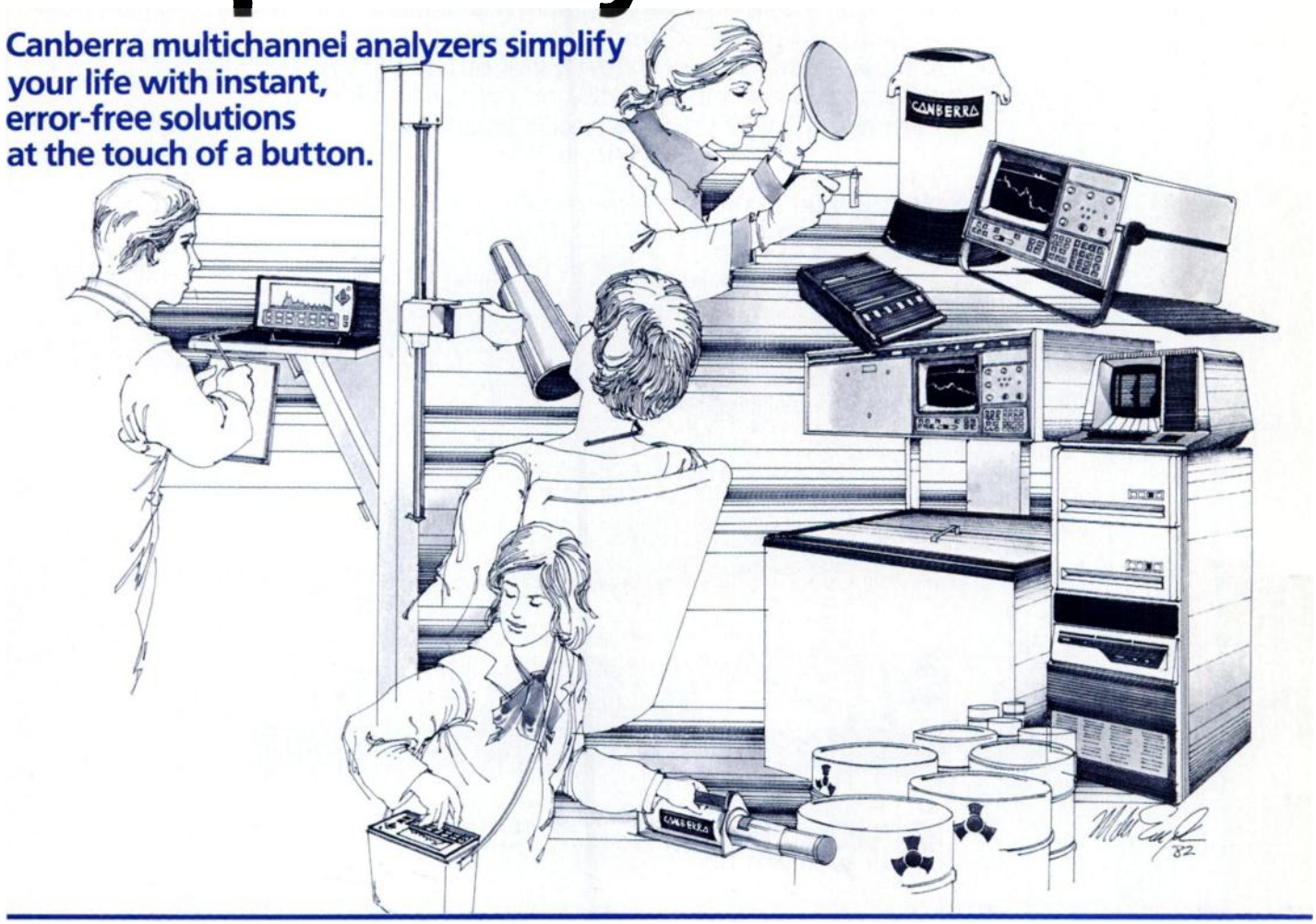
Radiopharmaceuticals should be used only by physicians who are qualified by training and experience in the safe use and handling of radionuclides, and whose experience and training have been approved by the appropriate government agency authorized to license the use of radionuclides.

ADVERSE REACTIONS: Aseptic meningitis and pyrogenic reactions have been rarely (less than 0.4%) observed following cisternography with Pentetate Indium Disodium In 111.

HOW SUPPLIED: Pentetate Indium Disodium In 111 (no-carrier-added) is supplied in single dose glass vials, each containing 1.5 ml of solution with a concentration of 1 millicurie per ml and a total activity of 1.5 millicurie per vial at calibration time.

Take the Mystery out of Isotopic Analysis.

Canberra multichannel analyzers simplify your life with instant, error-free solutions at the touch of a button.



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The self-contained Series 10 spectroscopy system, with automatic background subtraction, energy calibration, and instant dose calculation capabilities, generates perfect pictures of critical data.

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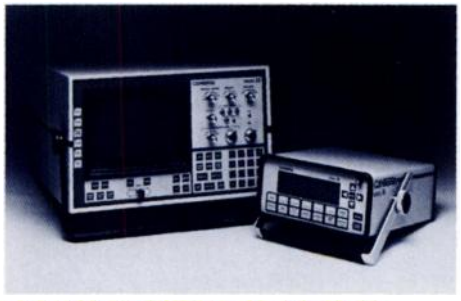

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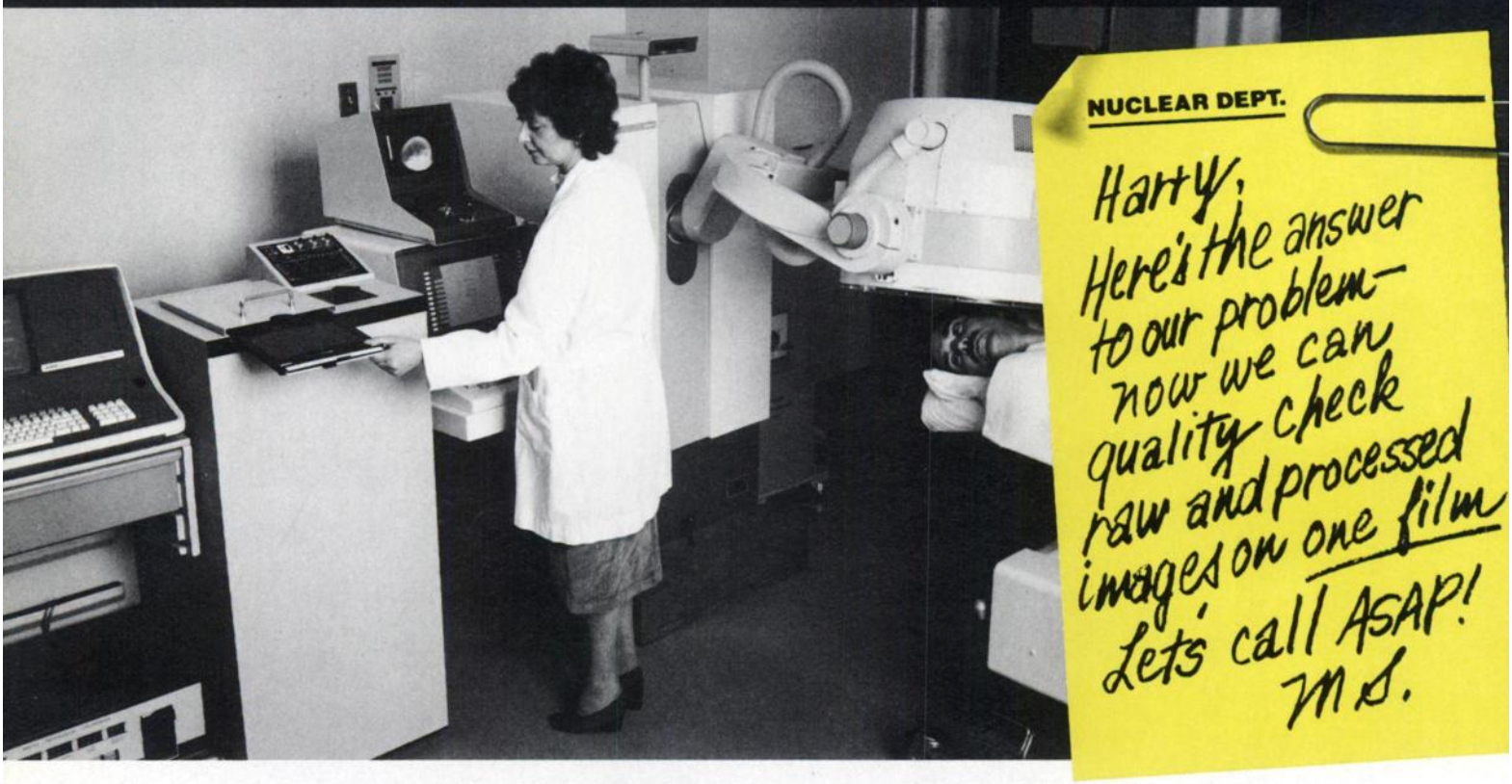

The 5000C combination nuclear detector and computer/video imager from IIE.

Until now, computer assisted nuclear imaging required two separate hard copy imagers: one for the gamma camera and one for the computer. Now there's an imager that does both.

Actually, the 5000C does a lot more. It's the first combination imager that lets you alternate from raw data to computer at a flip of a switch. And allows side-by-side x,y and video studies on the same sheet of 8 x 10 film. It even offers a choice of format sizes and separate contrast controls for each mode. And features the proven reliability of IIE's patented electro-magnetically controlled shutter.

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IIE, 901 S. Kay, Addison, IL 60101.
(312) 543-4878. Attn: Marketing/Sales.

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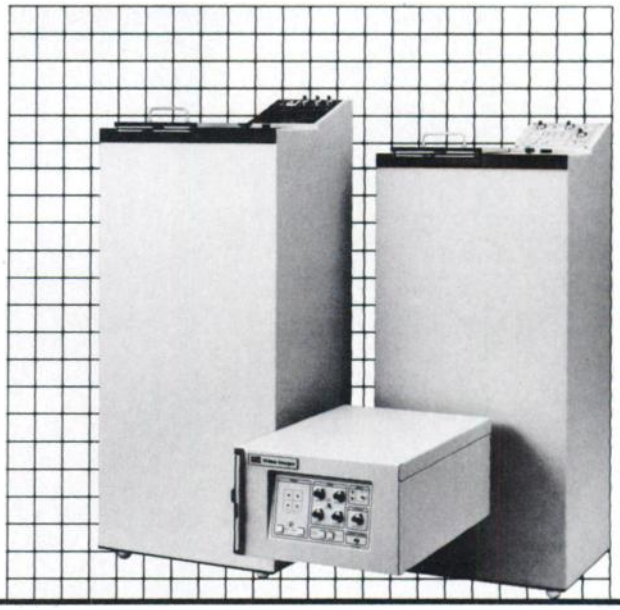

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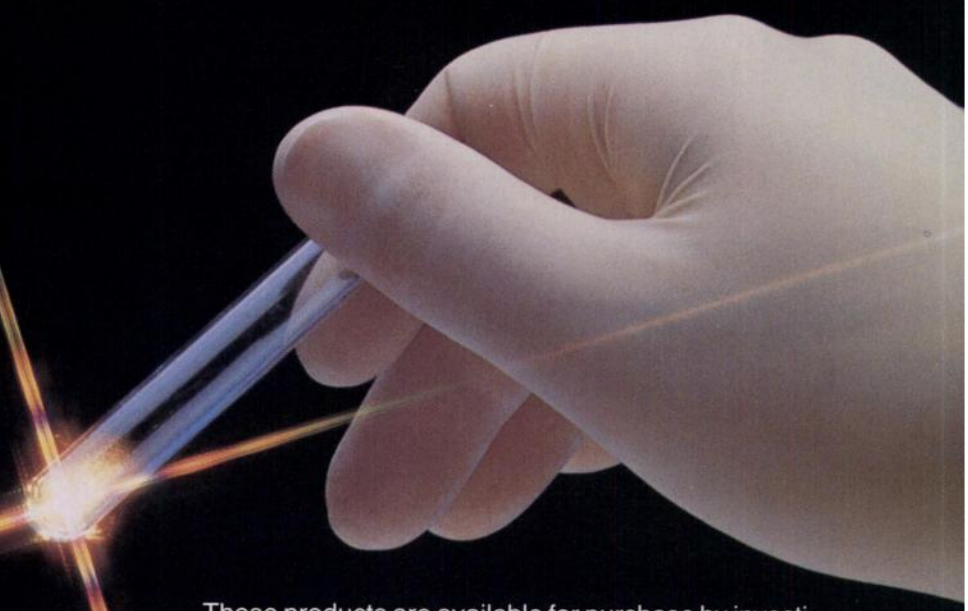

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Low pH, medium concentration
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TIN 113/INDIUM 113m GENERATORS
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CAUTION: THESE PRODUCTS ARE NOT FOR HUMAN USE IN PRESENT FORM AND ARE NOT TESTED FOR STERILITY OR APYROGENICITY.

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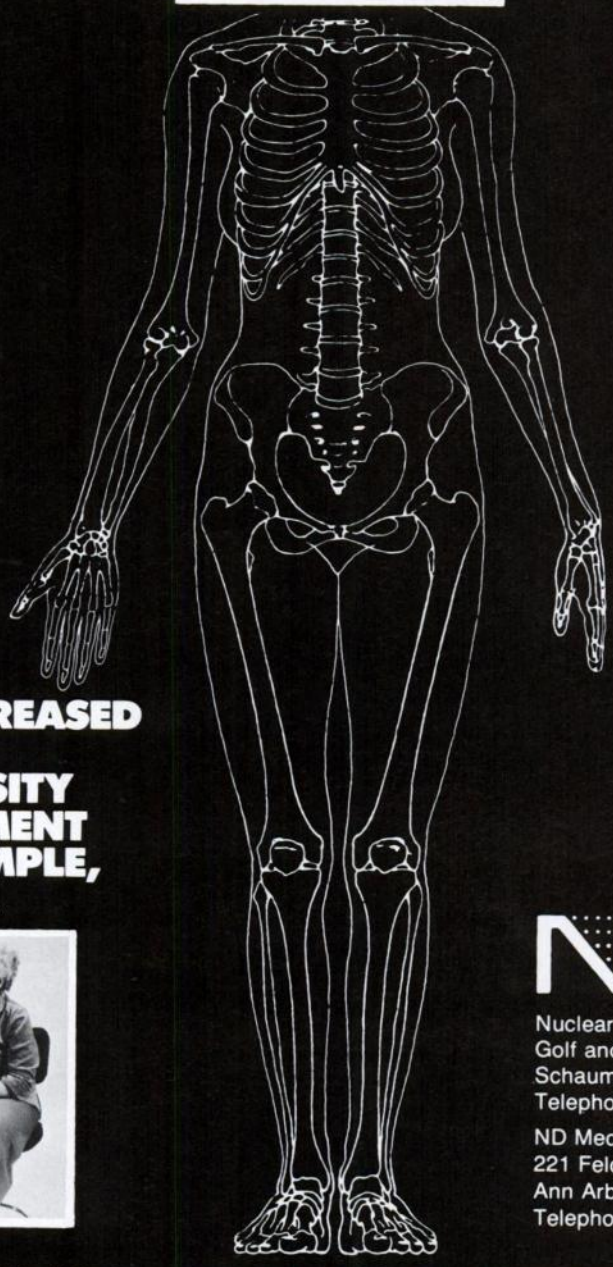

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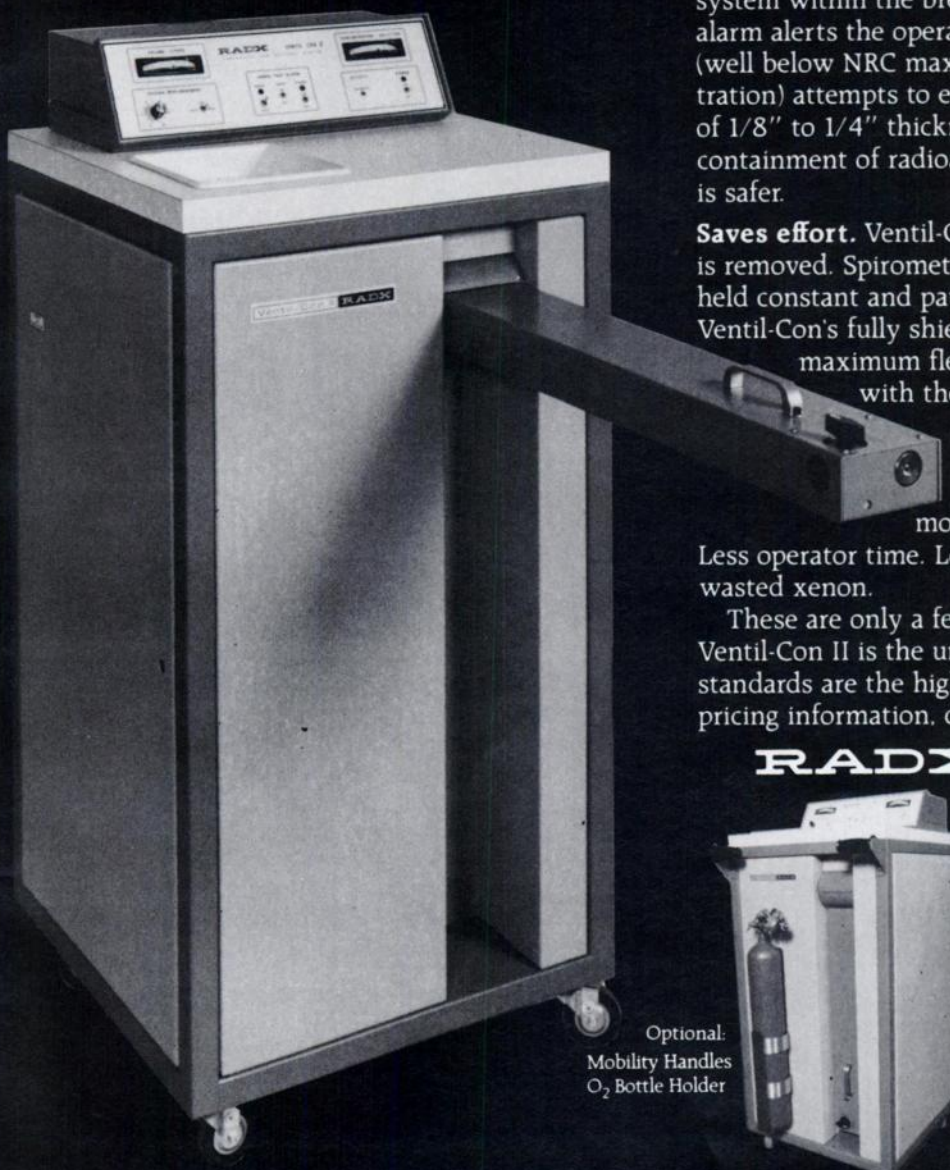
And there are plenty of good reasons for Ventil-Con's leadership. Quality is the first. Only RADX builds in the kind of excellence that has set the worldwide standard for reliability. Ventil-Con II is also the **only** completely mobile xenon gas ventilation unit available anywhere.

Saves money and time. Ventil-Con retains over 90% of the xenon gas within its dry spirometer system, ready for use and re-use in examination after examination. A bacteriological filter and CO_2 absorber within the spirometer breathing system continuously filter the xenon enriched atmosphere breathed by the patient. Breathing resistance is only 0.2" of water. No disconnects or aborted exams caused by breathing resistance. Result: More patient throughput.



Saves radiation. An internal charcoal cartridge pack traps the xenon gas exhausted by the patient at washout. The flow of gas to the charcoal pack is completely controlled by an interface system within the breathing apparatus. A built-in alarm alerts the operator if more than 2 uCi/liter (well below NRC maximum permissable concentration) attempts to escape. Radiation shielding of 1/8" to 1/4" thickness of lead provides positive containment of radioactivity. Result: Ventil-Con II is safer.

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A Calicheck kit is so fast, efficient and easy to use, you may wish to check dose calibrator linearity more frequently. Lets you spot trouble before it becomes serious.

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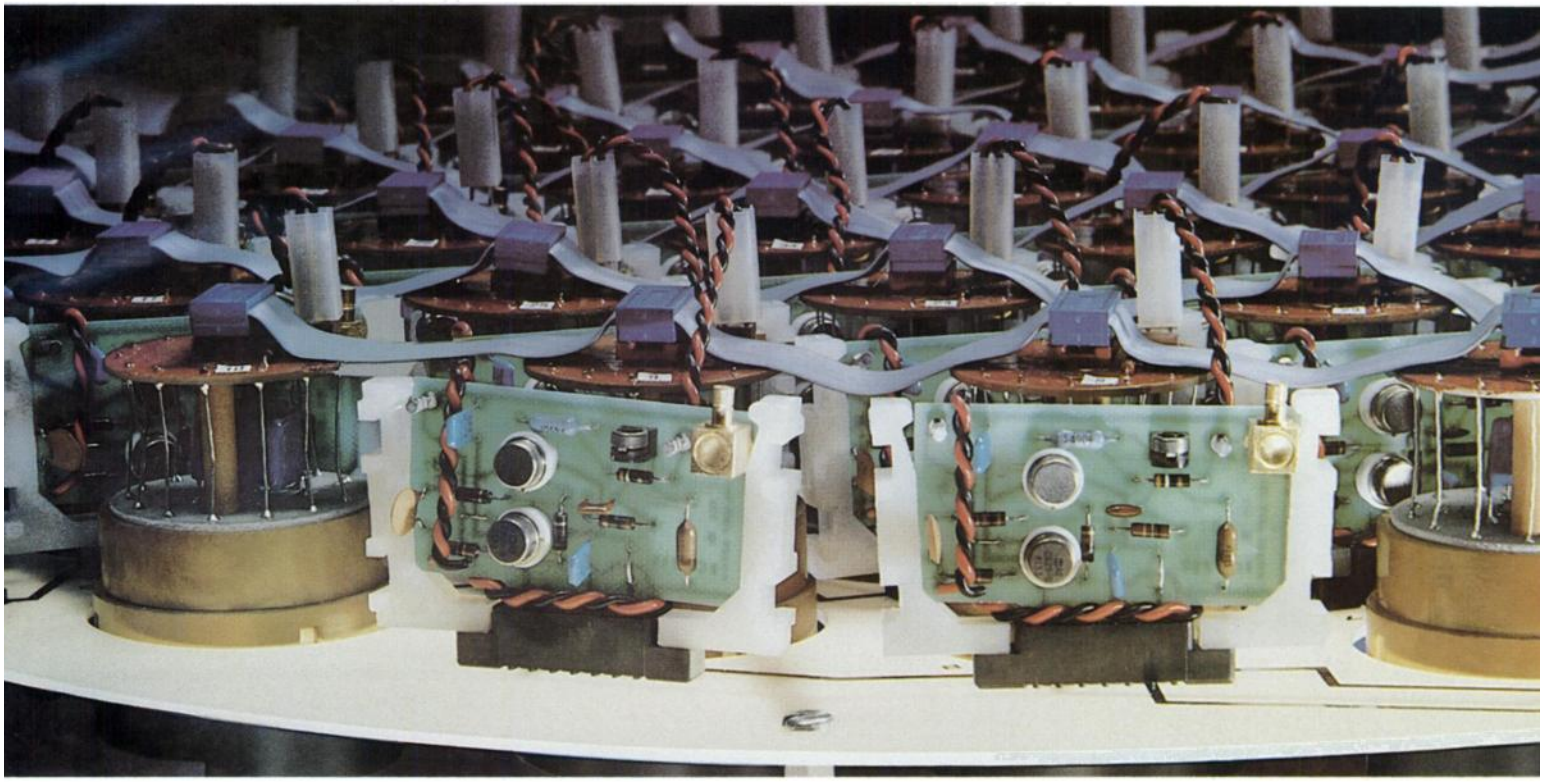

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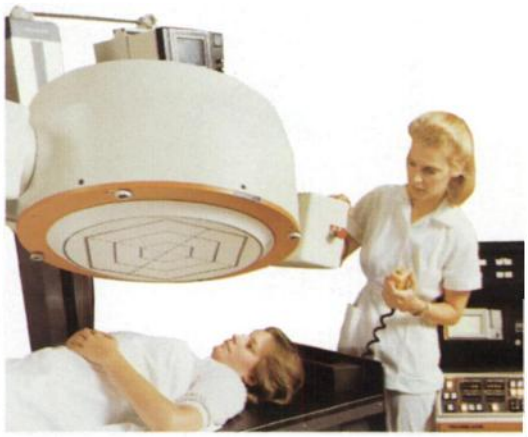

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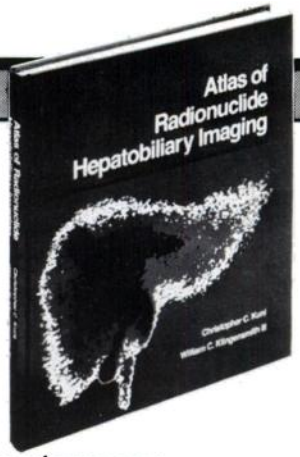
Atlas of Radionuclide Hepatobiliary Imaging



Christopher C. Kuni, M.D. and **William C. Klingensmith III, M.D.**
both of the University of Colorado Health Sciences Center, Denver

"The book is unusually well organized. The illustrations are excellent, the references are current, and the format is more than that of an atlas giving the reader quick access to specific information . . . Any physician concerned with imaging of the hepatobiliary system will welcome this new work."—***The New England Journal of Medicine***

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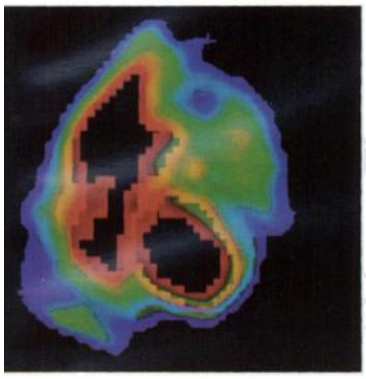

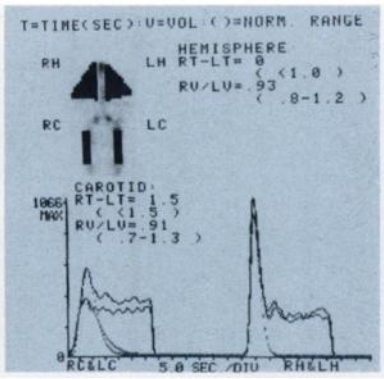

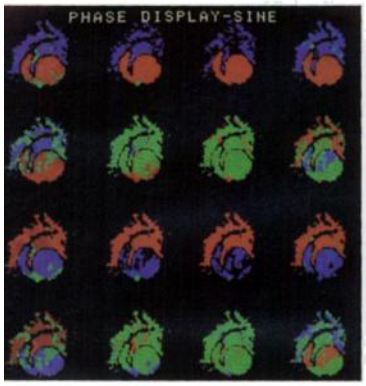

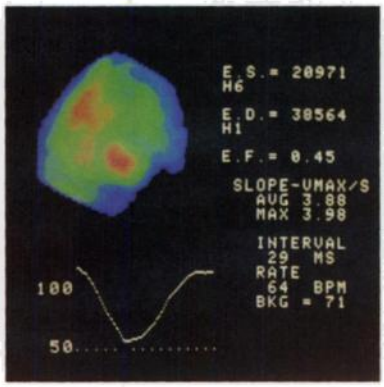

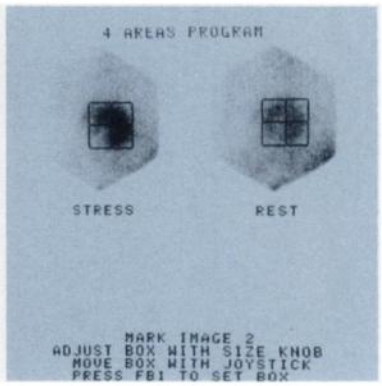

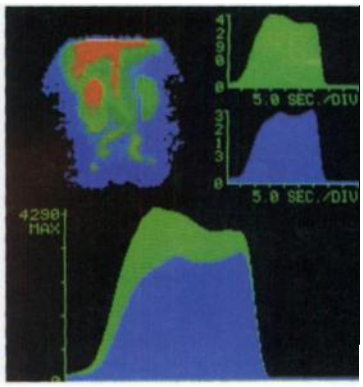

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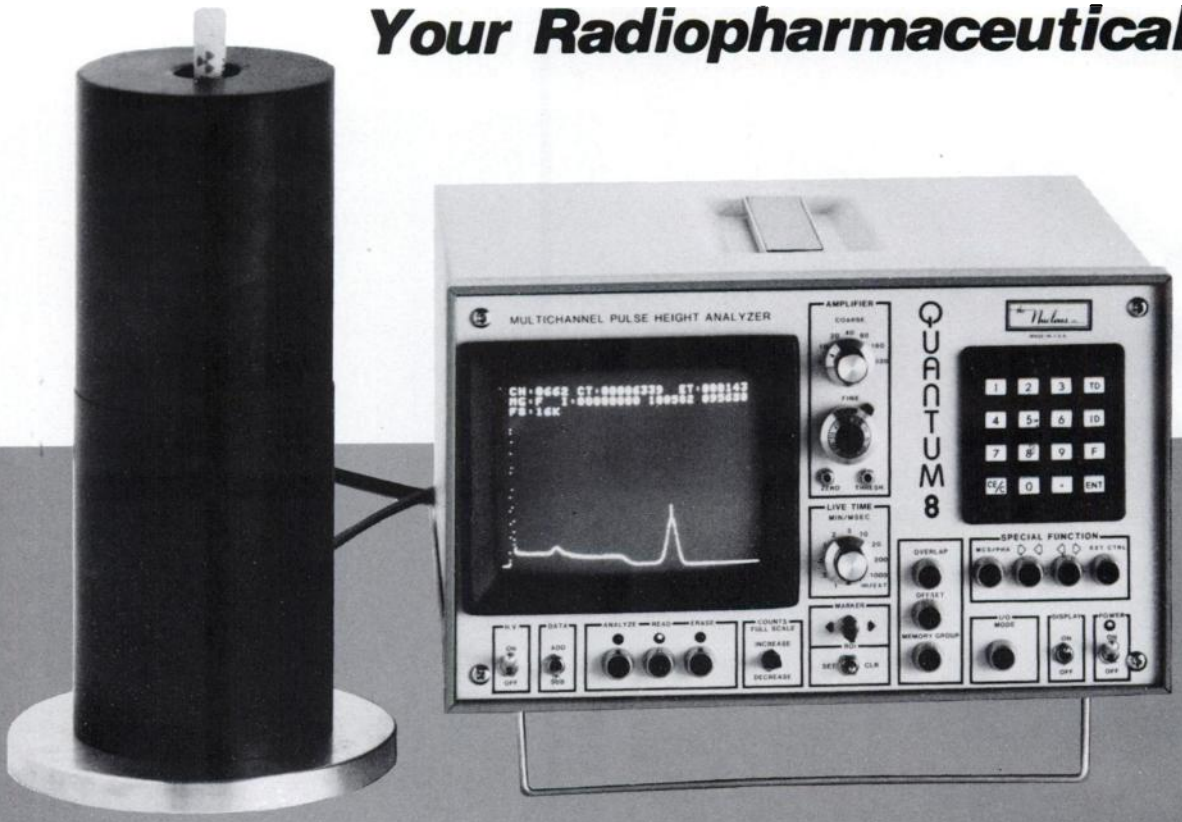

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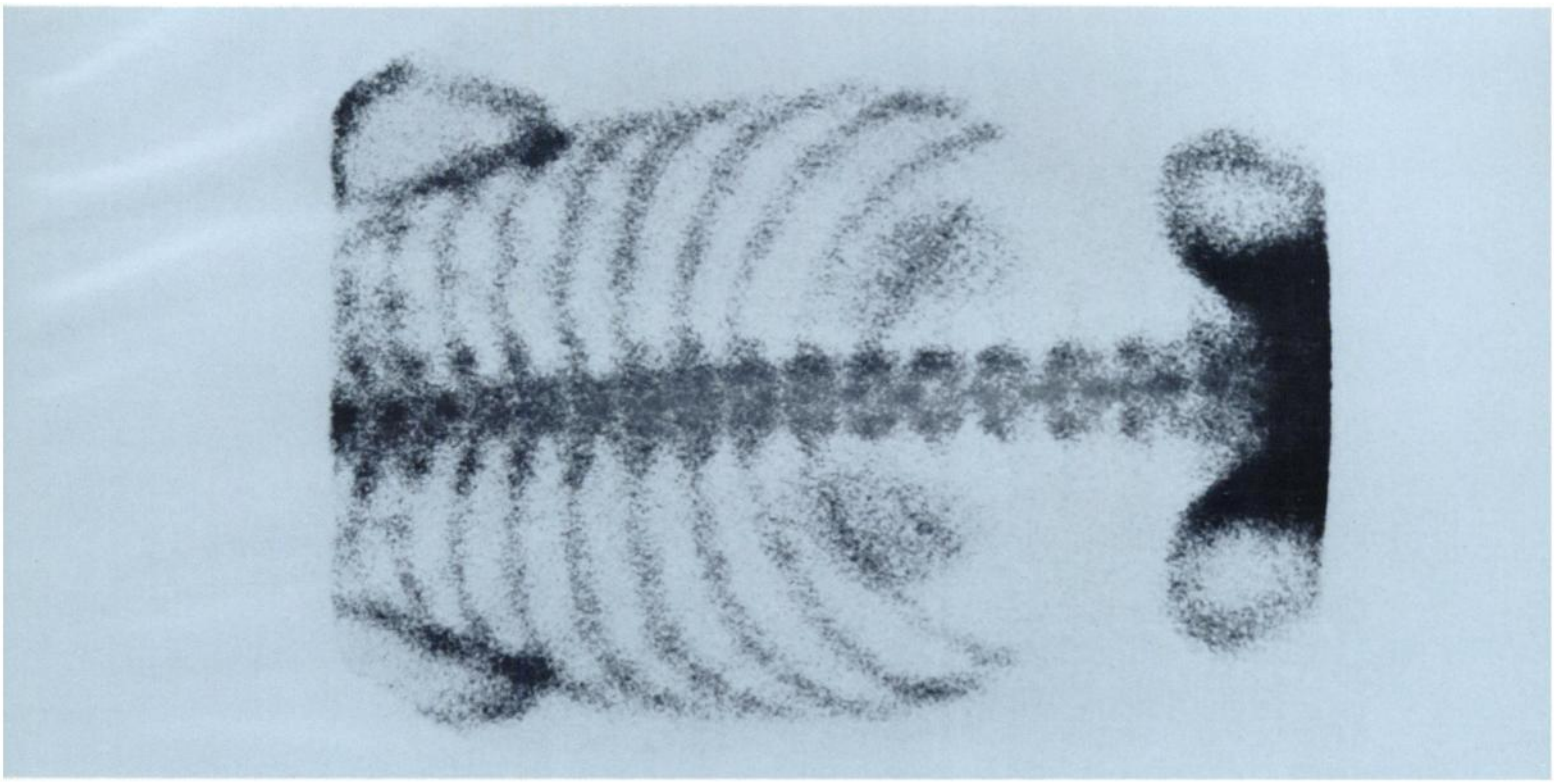

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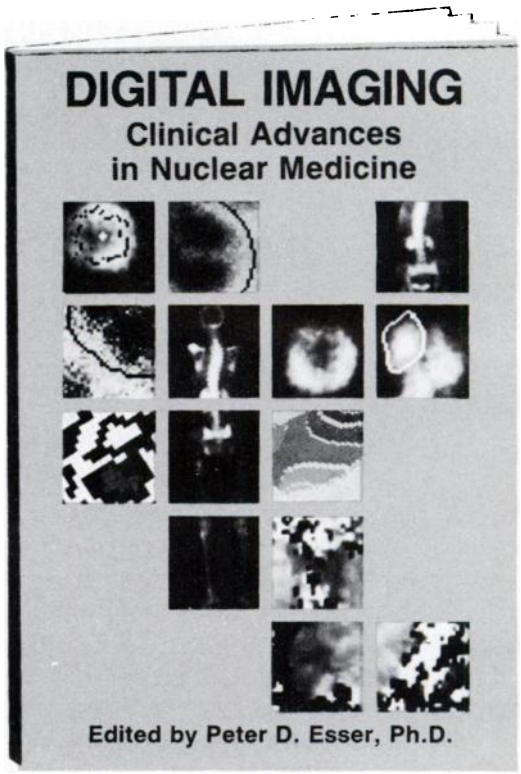

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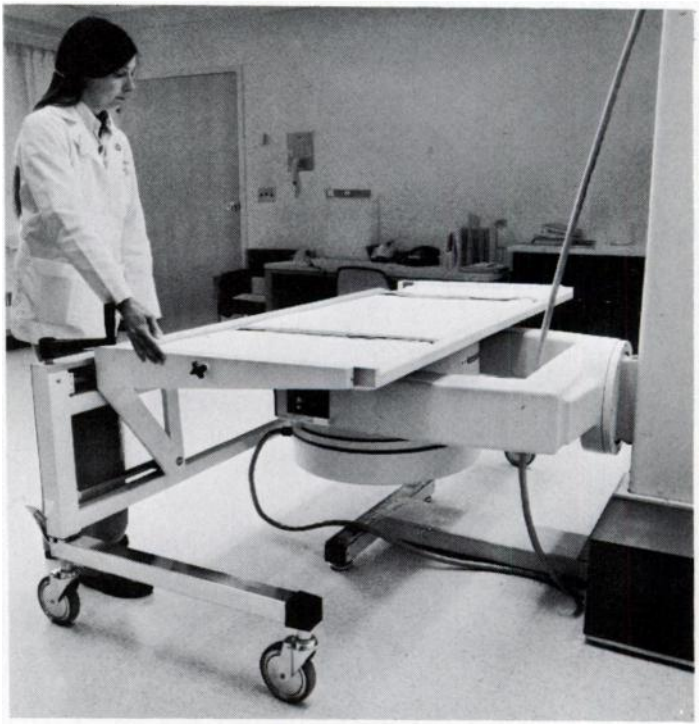

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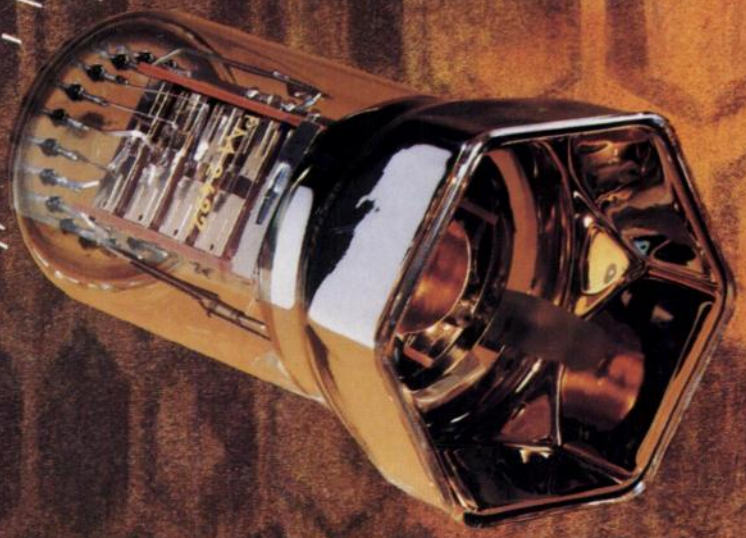

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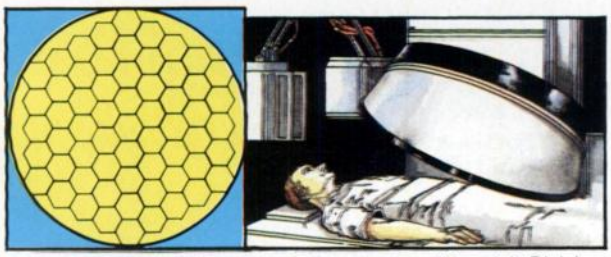

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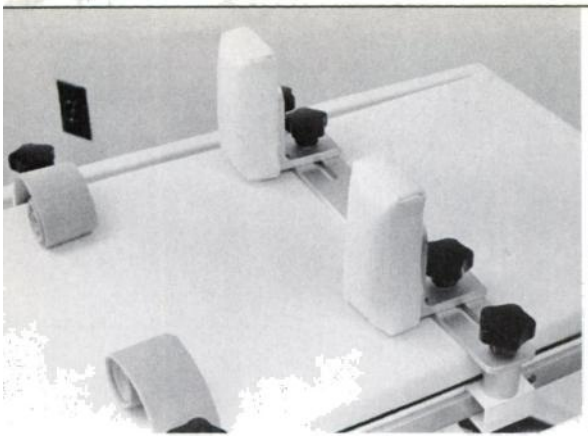

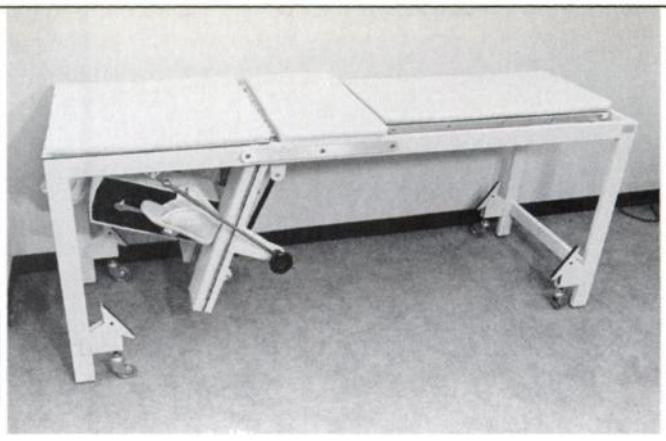

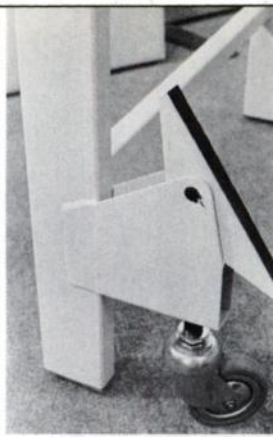

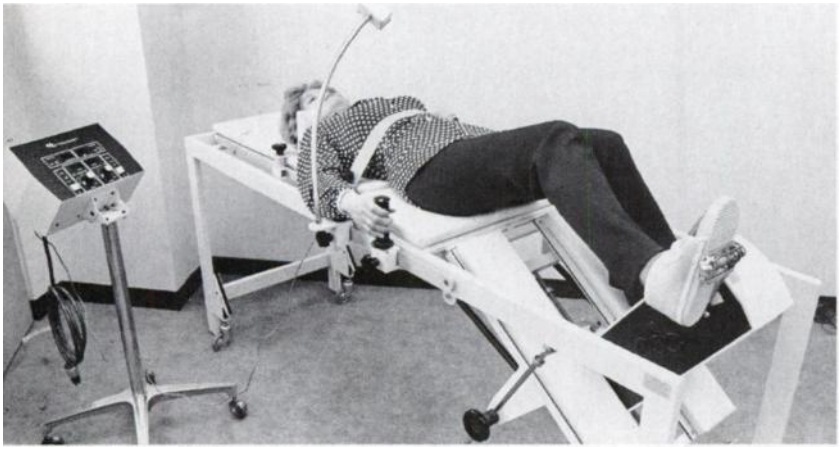

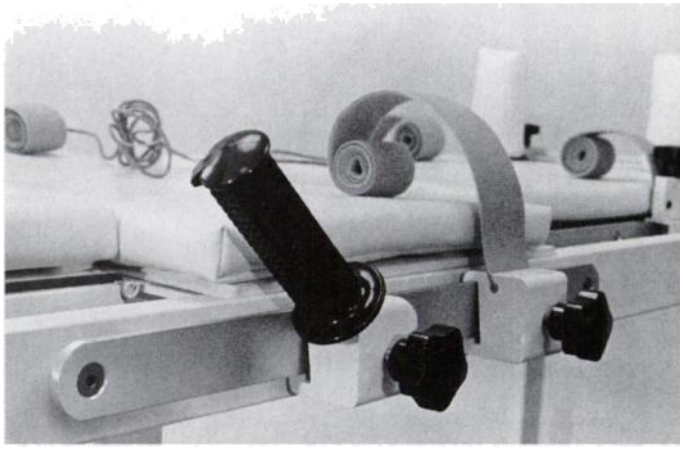

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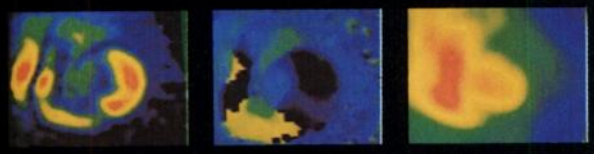

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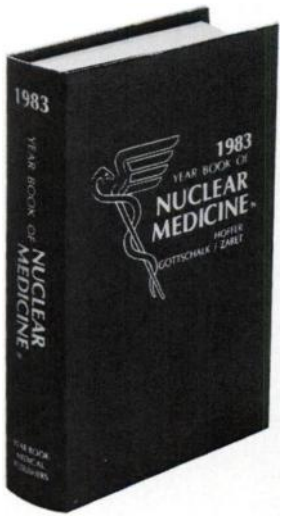

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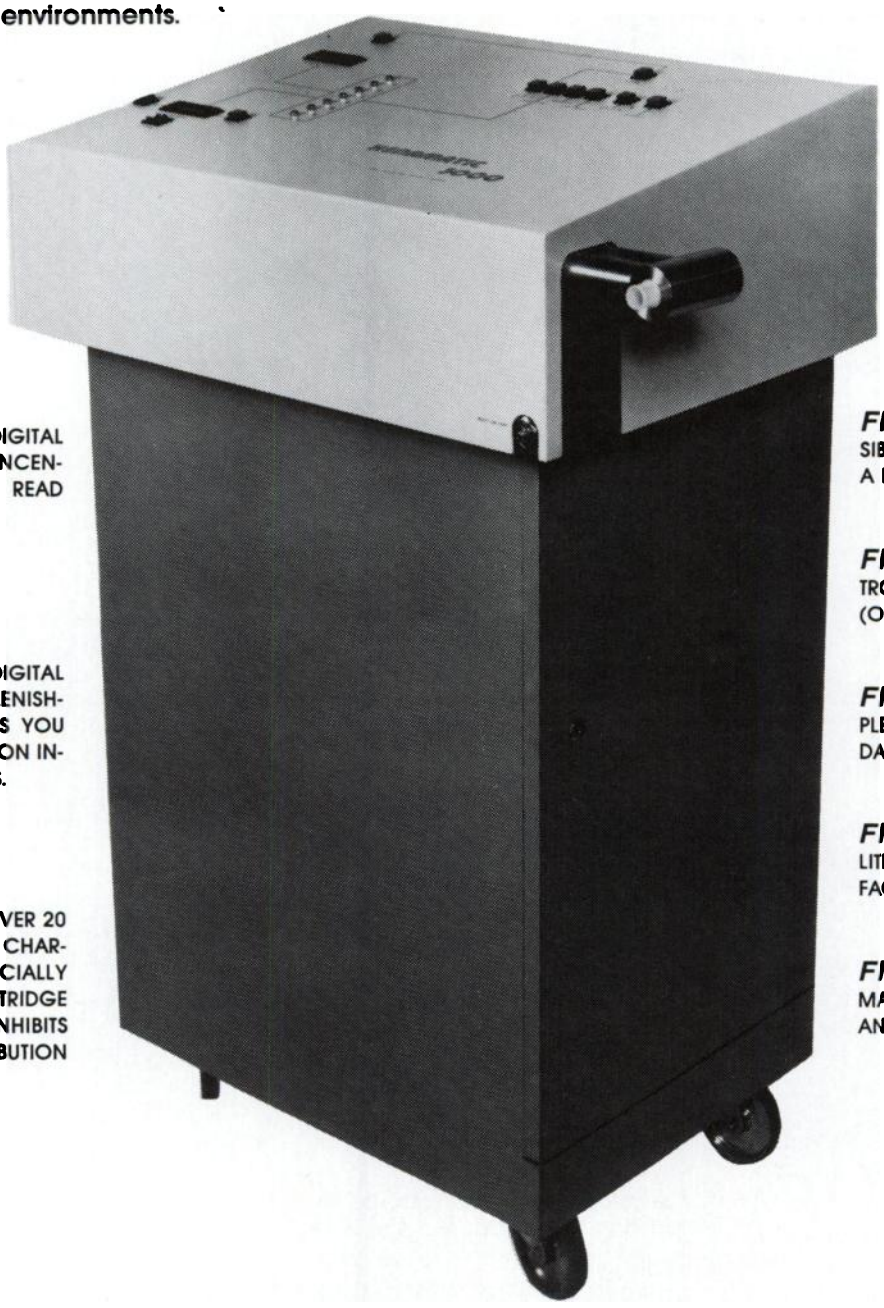

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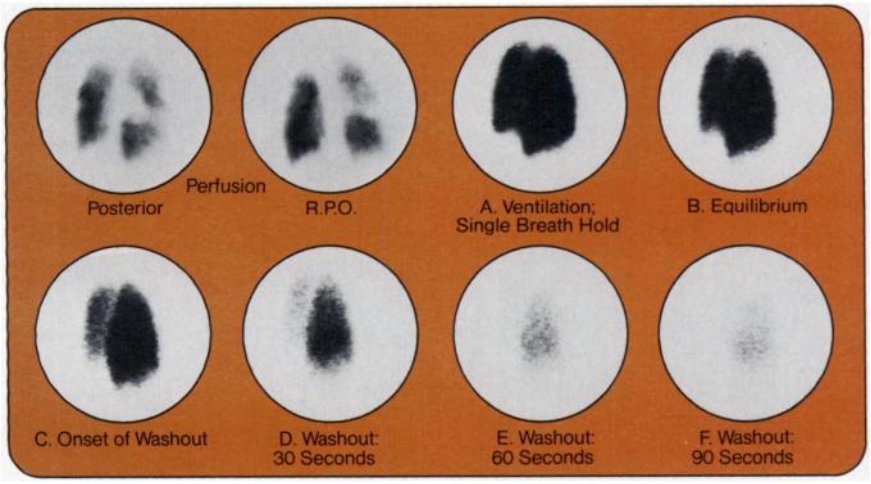
Krypton Kr 81m Gas generators must be ordered for the day needed; Xenon Xe 133 Gas must be ordered weekly. Xenon Xe 127 Gas, however, can be ordered monthly. It is available for delivery the first of each month, calibrated for the fifteenth day of the month.

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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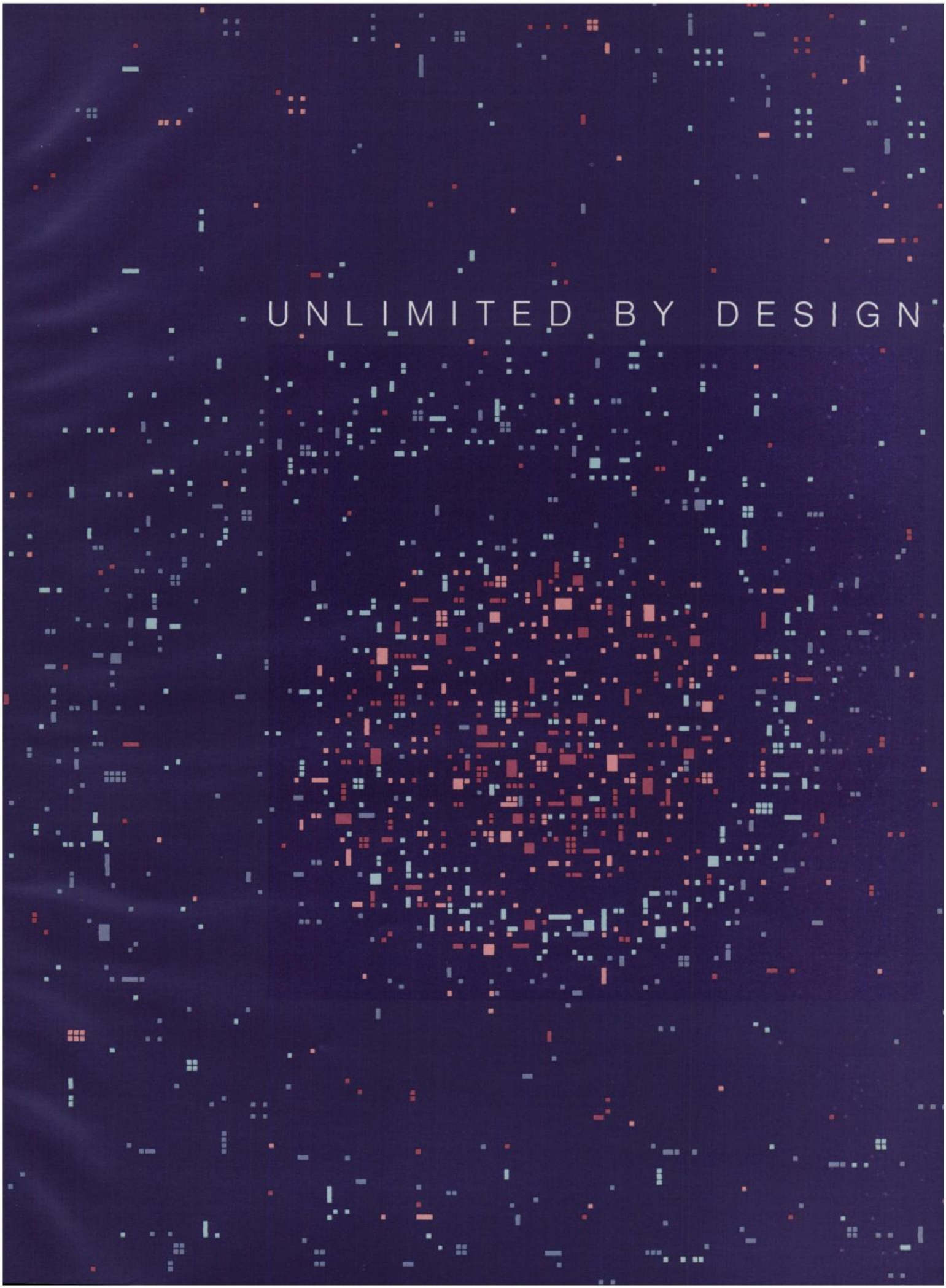
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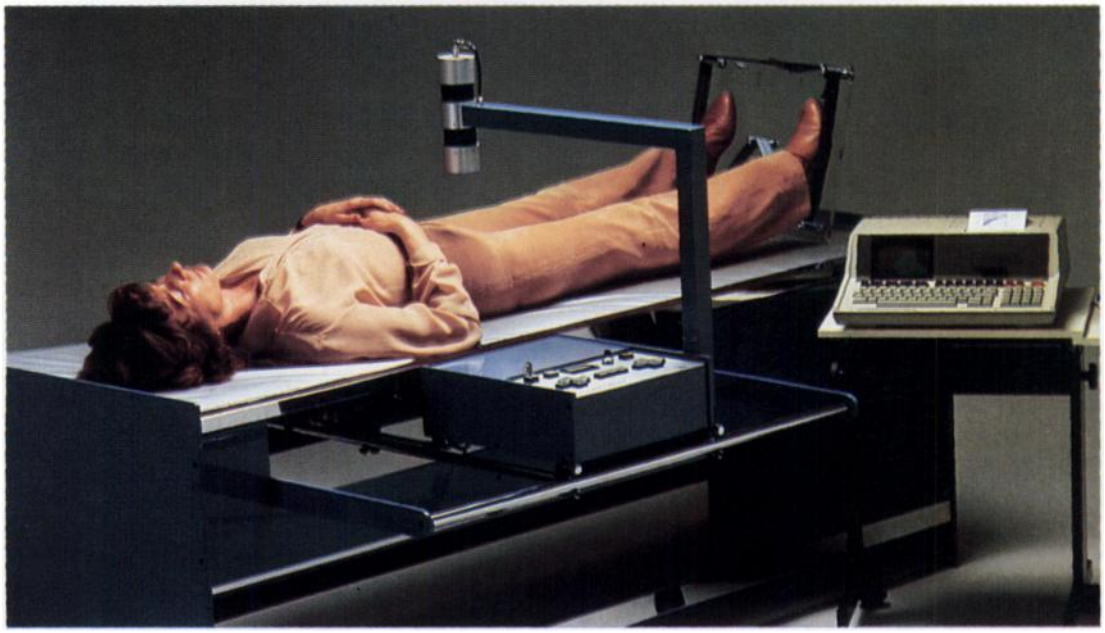

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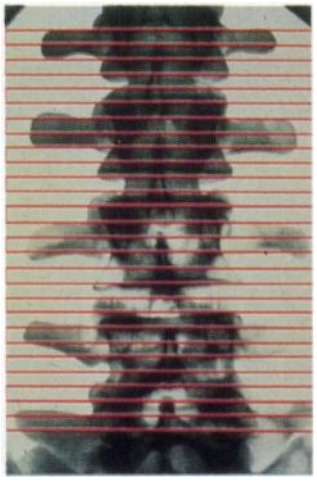

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References: 1. Littlefield JL, Rudd TH: Tc-99m Hydroxymethylene Diphosphonate (HMDP) versus Tc-99m Methylene Diphosphonate (MDP): Biological & clinical comparison. *Clin Nucl Med* 5:S28, 1980. **2.** Cowan RJ, Chilton HM, Ball JD, et al: A comparison of Tc-99m oxidronate (HDP) and Tc-99m medronate (MDP) for the detection of skeletal metastases. *Clin Nucl Med* 7: P71, 1982. **3.** Data on file, Procter & Gamble. **4.** Fogelman I, Pearson DW, Bessent RG, et al: A comparison of skeletal uptakes of three diphosphonates by whole-body retention: Concise communication. *J Nucl Med* 22:880-883, 1981.

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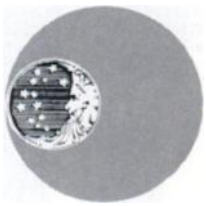

Visit us at the SNM Show in St. Louis at Booth 602

Please see the following page for a brief summary of prescribing information.

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PROCTER & GAMBLE

OSTEOSCAN®-HDP

Technetium Tc99m Oxidronate Kit

Visit the SNM Publications Sales Booth in St. Louis and see:

THE SQUIBB PLUS IS SERVICE

Diagnostics Representatives	Special representatives with extensive training and experience in radiopharmaceuticals, contrast media and RIA who can provide your laboratory with many extra services: troubleshooting, technologist training, expediting of deliveries, and inventory checks.
Squibb National Nuclear Medicine Management Seminars	The 2½-day seminar provides opportunity, ideas and techniques for nuclear medicine and clinical laboratory supervisors to enhance their managerial skills.
Technologist Education Plan	When spent Minitec® (Technetium Tc 99m) Generators are returned, Squibb puts money into customers' accounts for educational purposes.
Squibb National Nuclear Medicine Seminars	Education for technologists: 2½ days on *in vivo* procedures, 1½ days on *in vitro* procedures. Accredited by the Society of Nuclear Medicine Technologist Section, American Society of Radiologic Technologists, and American Society for Medical Technology for continuing education credit.
Medical Education	Squibb helps further medical education through its support of state and local nuclear medicine societies' meetings, medical symposia and scientific exhibits.
Customtec®	Computerized report of a laboratory's daily technetium Tc 99m needs.
Delivery	Reliable, fast delivery service from manufacturing facilities and distribution centers throughout the U.S.
Toll-Free Technical Customer Service	Trained personnel are available at Squibb headquarters to answer questions and give expert assistance when problems arise. Call 800-257-5181. In New Jersey, 800-582-5913.

THALLIUM 201-SQUIBB® (Thallous Chloride Tl 201)
For Diagnostic Use

DESCRIPTION: THALLIUM 201-SQUIBB (Thallous Chloride Tl 201) is supplied in isotonic solution as a sterile, nonpyrogenic diagnostic radiopharmaceutical for intravenous administration. The aqueous solution at calibration time contains 1 mCi/ml Thallous Chloride Tl 201 adjusted to pH 4.5-6.5 by the addition of hydrochloric acid and/or sodium hydroxide solution. It is made isotonic with 0.9% sodium chloride and is preserved with 0.9% benzyl alcohol. Thallium Tl 201 is cyclotron-produced with no carrier added. Radionuclidic purity at calibration is at least 97.0% Thallium Tl 201 with less than 0.25% Lead Pb 203, 1% Thallium Tl 202, and 1% Thallium Tl 200. The concentration of each radionuclidic contaminant changes with time.

INDICATIONS AND USAGE: Thallous Chloride Tl 201 may be useful in myocardial perfusion imaging for the diagnosis and localization 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: If studying patients in whom ischemia or myocardial infarction is known or suspected, 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 — Data are not available concerning the effect on the quality of Thallium Tl 201 scans of marked alterations in the blood glucose, insulin, or pH (such as is found in diabetes mellitus). Attention is directed to the fact that thallium is a Tl 201 to minimize radiation exposure to the patient consistent with proper management and to ensure minimal exposure to occupational workers.

This drug should not be used after the expiration date on the label. The expiration date will be six (6) days or less after the calibration date.

Do not use if contents are turbid.

It is recommended that the product be administered close to calibration time to minimize the effect of higher levels of radionuclidic contaminant pre- and post-calibration.

Carcinogenesis — 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 — Adequate reproduction studies have not been performed in animals to determine whether the drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Thallous Chloride Tl 201 should not be used in pregnant women except when benefits clearly outweigh the potential risks.

Ideally, examinations using radiopharmaceutical drug products — especially those elective in nature — of women of childbearing capability should be performed during the first ten 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, as a general rule nursing should not be undertaken when a patient is administered radioactive material.

Pediatric Use — Safety and effectiveness in children below age 18 have not been established.

ADVERSE REACTIONS: A single adverse reaction to Thallous Chloride Tl 201 has been reported consisting of hypotension accompanied by pruritus and rash which

Scan with the eye of an eagle

PROCTER & GAMBLE

OSTEOSCAN®-HDP

Technetium Tc99m Oxidronate Kit

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

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.

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 20 mCi. 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.

HOW SUPPLIED
OSTEOSCAN-HDP is supplied as a lyophilized powder packaged in vials. Each vial contains 3.0 mg oxidronate sodium and 0.24 mg stannous chloride as active ingredients, and 0.84 mg gentisic acid as a stabilizer. Kits containing 5 or 30 vials are available. The NDC number for this product is NDC 37000-407-01. The drug can be stored at room temperature both prior to and following reconstitution with ADDITIVE-FREE sodium pertechnetate Tc99m.

July, 1982

Visit the SNM Publications Sales Booth in St. Louis and see:

4 New Books—

Low-Level Radiation Effects:
A Fact Book

Emission Computed Tomography:
Current Trends

Digital Imaging:
Clinical Advances in Nuclear Medicine

Nuclear Medicine Science Syllabus
(2nd Edition)

2 New Patient Information Pamphlets—

A Patient's Guide to Nuclear Medicine

Guidelines for Patients
Receiving Radioiodine Treatment

and SNM's Audiovisual series.

Visit us in the Registration Area on Monday - Thursday from 7:30-5:30 and on Friday from 7:30-12:30.

The Society of Nuclear Medicine, Inc.
475 Park Avenue South
New York, NY 10016

The heart of the matter—quality and value

Visit us at Island 10 at the SNM St. Louis Meeting

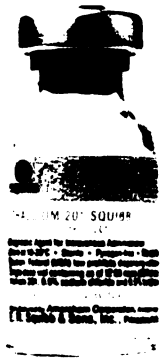
Thallium 201-Squibb®

Thallous Chloride Tl 201

For myocardial perfusion imaging

- Choice of quantities: 2.2 and 6.6 mCi at calibration time (noon Central Time)
- Precalibrated doses available
- Excellent images
- Can be consolidated with your Minitec® (Technetium Tc 99m) Generator and other Squibb products to save delivery charges

See your Squibb Representative for details or call toll-free 800-257-5181 (New Jersey 800-582-5913).



Medotopes®

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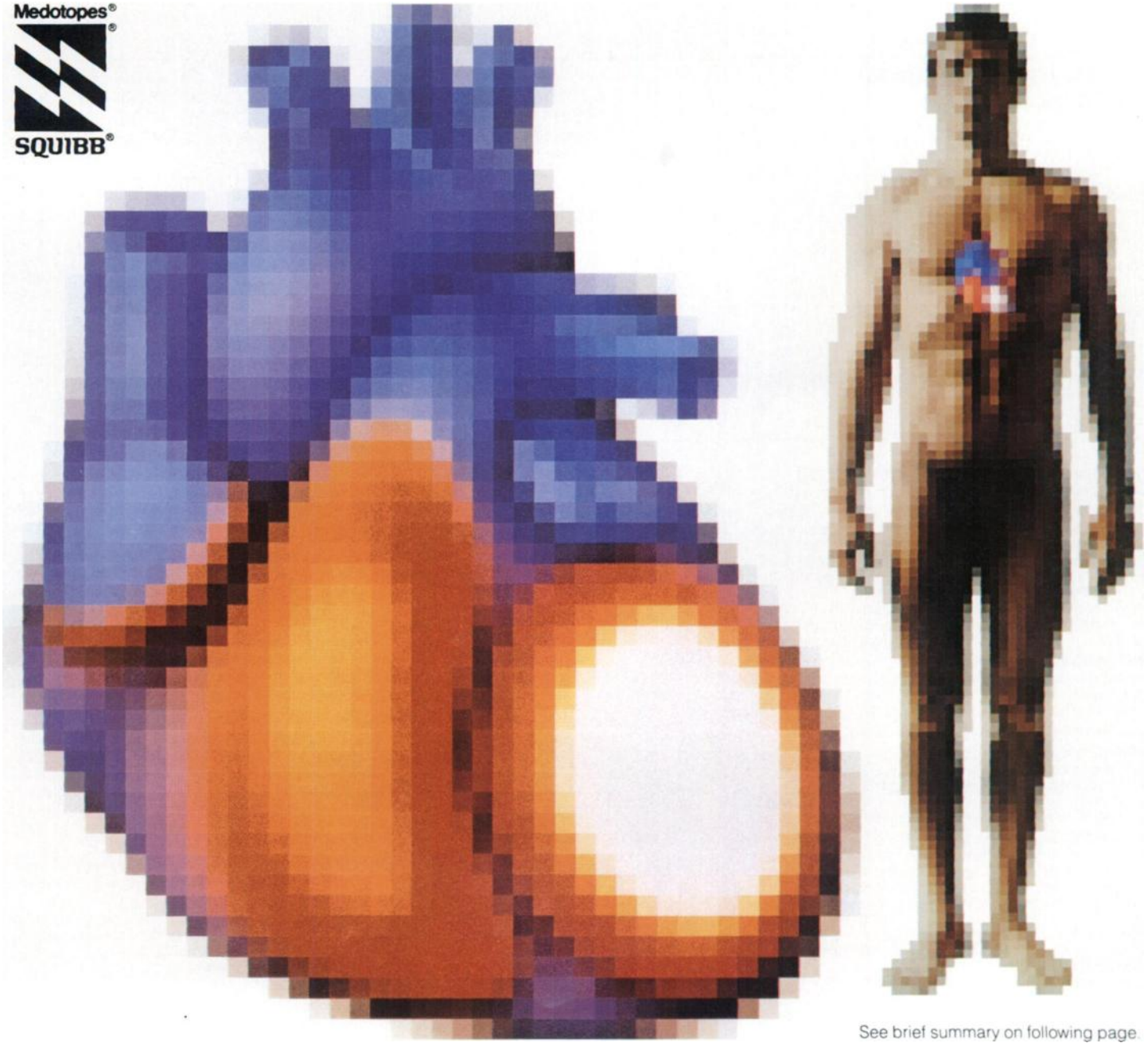

See brief summary on following page.

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INDICATIONS AND USAGE: Thallous Chloride Tl 201 may be useful in myocardial perfusion imaging for the diagnosis and localization 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: If studying patients in whom ischemia or myocardial infarction is known or suspected, 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 — Data are not available concerning the effect on the quality of Thallium Tl 201 scans of marked alterations in the blood glucose, insulin, or pH (such as is found in diabetes mellitus). Attention is directed to the fact that thallium is a potassium analog, and since the transport of potassium is affected by these factors, the possibility exists that the thallium may likewise be affected. Data are not available concerning the effect of drug treatment (such as antihistamines and cimetidine, either alone or in combination).

A myocardial imaging study was unsuccessful in one clinical study involving a patient taking cortisone and cimetidine the day of the study.

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 governmental agency authorized to license the use of radionuclides.

As in the use of any radioactive material, care should be taken with Thallous Chloride Tl 201 to minimize radiation exposure to the patient consistent with proper management and to ensure minimal exposure to occupational workers.

This drug should not be used after the expiration date on the label. The expiration date will be six (6) days or less after the calibration date.

Do not use if contents are turbid.

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Pregnancy Category C — Adequate reproduction studies have not been performed in animals to determine whether the drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. Thallous Chloride Tl 201 should not be used in pregnant women except when benefits clearly outweigh the potential risks.

Ideally, examinations using radiopharmaceutical drug products — especially those elective in nature — of women of childbearing capability should be performed during the first ten 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, as a general rule nursing should not be undertaken when a patient is administered radioactive material.

Pediatric Use — Safety and effectiveness in children below age 18 have not been established.

ADVERSE REACTIONS: A single adverse reaction to Thallous Chloride Tl 201 has been reported consisting of hypotension accompanied by pruritus and rash which responded to antihistamines and steroids within one hour.

HOW SUPPLIED: Thallous Chloride Tl 201 is supplied in a 2.2 millicurie size and a 6.6 millicurie size. Each package contains one vial. The contents of the vial are radioactive. Adequate shielding and handling precautions must be maintained.

For full prescribing information, consult package insert.

SQUIBB® Princeton, N.J. 08540

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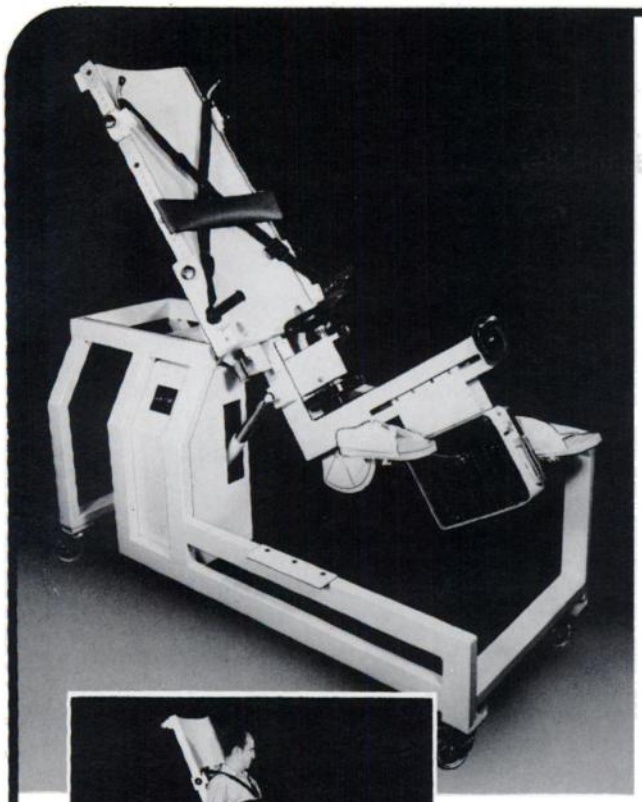
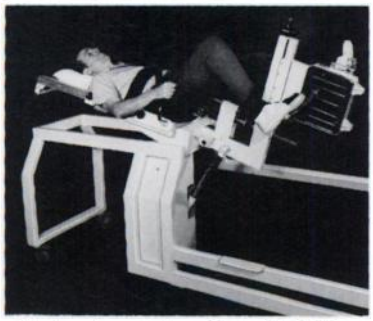


MOTORIZED

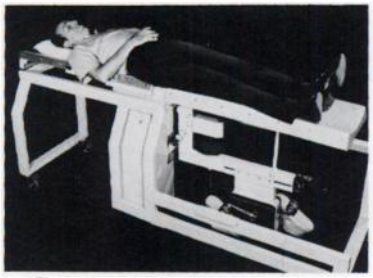
Nuclear Cardiology Stress System

Makes patient positioning so easy

Erect stress test position with Collins Ergometer.



Supine stress test position with Collins Ergometer. Far side of table is unobstructed to easily accommodate a gamma camera.



Patient positioned for conventional imaging.
Legs and feet are supported comfortably.

- **Pushbutton power moves patient to ANY position, supine to upright.**
- **Compatible with all cameras.**
- **Motion-free for high resolution.**

Here is the most versatile, easy-to-operate, stress imaging table available today. It permits radionuclide imaging in any position... upright, supine, and between...without cranking, lifting, pushing or fussing with table hardware. Just flip one switch, and the powerful motor quietly moves the patient to the precise position desired. The patient is more relaxed... and so are you.

Whatever your nuclear cardiology requirements, this unique system fills them quickly and easily... full gamma camera clearance, complete mobility, motion-free stability, positive (but comfortable) patient restraints, unobstructed access to the patient and controls, optional ergometer, and much more. The table is guaranteed to help stress your patients, not you or your personnel.

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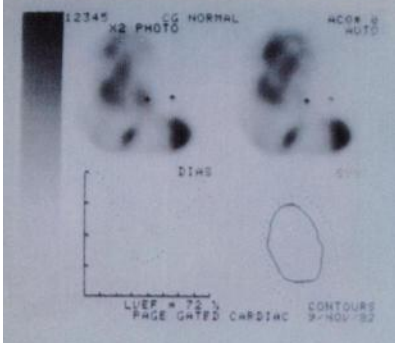
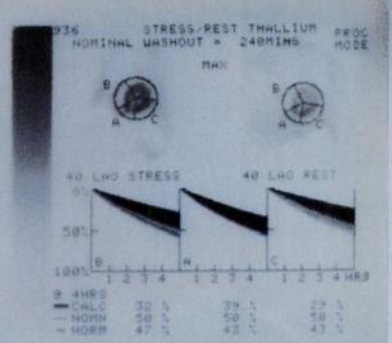
One camera can handle all your routine studies...



The P.A.G.E. cardiac protocol allows automatic edge detection, background determination, and ejection fraction determination. This prevents intra- and inter-user variability.



Quantitative data concerning spatial distribution of thallium, and regional plotting of kinetic washout, are produced automatically or semi-automatically.

This 38-year-old male patient had a viral infection for one month. Impression: normal liver/spleen scan.

This is a 14-year-old male who had ankle pain for 16 months. Impression: ankylosis of the tarsal bones, right foot.

You can conduct nuclear studies like these—from the simplest to the most sophisticated—with General Electric's MaxiCamera™ 400A/Star™ system. It's the time-proven system so advanced, so versatile, that it meets today's diagnostic needs. And leaves you with lots of room for cost-effective expansion as new procedures emerge.

Exceptional versatility in a complete system.

With the MaxiCamera 400A system you can configure equipment to meet your procedural, budgetary and spatial limitations. GE nuclear cameras let you easily and reliably perform all the routine imaging tasks—bone, liver, lung, heart and renal studies, for example. And the MaxiCamera 400A/Star system allows you to conduct complex ECT studies as well.

For sophisticated procedures, simply add the necessary options. Unlike other systems, you don't have to buy (and find room for) additional cameras. With the right options, ours will do it all.

Take, for instance, the GE Star data processor. Designed specifically to expand department capabilities, the Star system gives you quantitative output, high speed dynamic data collection, and a host of clinically proven software protocols that let you routinely perform specialized studies, like cardiac gated analysis, quantitative thallium, renal function and ventilation/perfusion analyses. And, with the tomographic option, such advanced ECT studies as brain, bone, liver and cardiac procedures are easily performed.

If you'd like to dedicate a camera to special procedures, look into our other MaxiCamera systems. GE offers you a choice of five cameras with fields of view ranging from 200 to 500 mm.

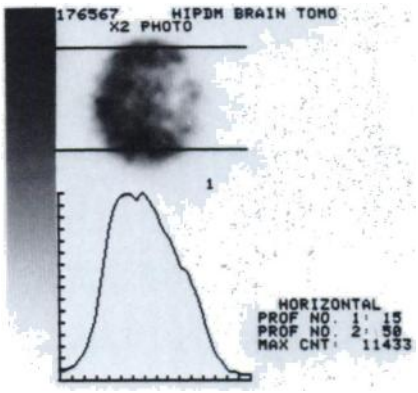
Beautiful images from a proven performer.

No matter what you're imaging, you'll get great resolution from your GE system. Our unique Autotune ZS™ circuitry is one reason. It automatically stabilizes each photomultiplier tube, making real time spatial distortion and energy correction viable. Result: System performance is improved dramatically with minimal downtime.

And, like every GE product, your MaxiCamera/Star system is backed by an unsurpassed worldwide service and parts network.

Want proof? Nearly 200 complete MaxiCamera/Star systems are in clinical use today; let us put you in touch with some of their users.

The MaxiCamera/Star system from General Electric. It may be the only nuclear imaging system you'll need.



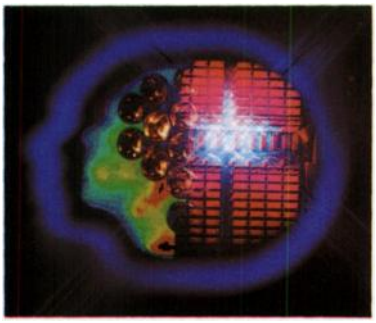
A 62-year-old female was admitted with right paralysis. Emergency CT was negative. Carotid arteriogram demonstrated a total left carotid occlusion. SPECT results confirmed arteriographic findings, as this profile analysis of select transaxial slices shows.

and those that may soon be routine.

We bring good things to life.

GENERAL ELECTRIC

Visit us at the SNM Show in St. Louis at Island 1



There are 32 reasons why Apex Processors are better than any other Nuclear Medicine Data Systems. This is reason Number

20

With an apex rotating-gantry NM system, you will not need an extra ECT processor, it's built-in!

elscint's **apex line**

Visit us at the SNM Show in St Louis at Island 3

Elscint has prepared a full-color booklet detailing all 32 reasons. Contact us today for your personal copy.

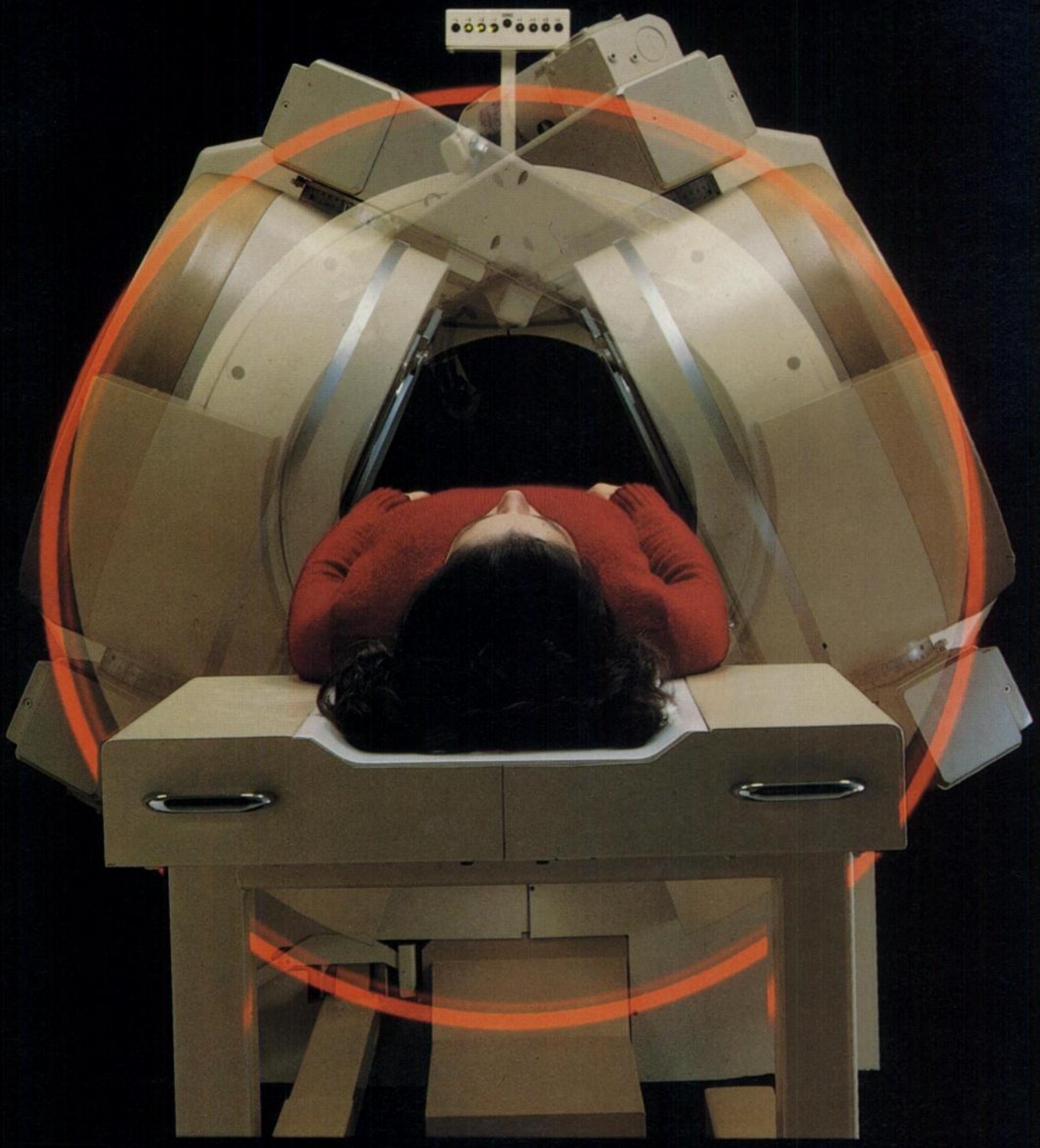
20

The same built-in APEX processor which controls gantry rotation also provides tomographic reconstruction on high-resolution 128^2 matrices – in just seconds.

The APEX ECT processor obtains thallium cardiac sections using semipanoramic 180° anterior rotations. It reconstructs not only transverse slices, but also coronal, sagittal and general oblique views.

Add outstanding linearity, uniformity, and Digital Guard™ auto-alignment of APEX processor-controlled gamma cameras, and two things become eminently clear: the APEX image – and the APEX image.

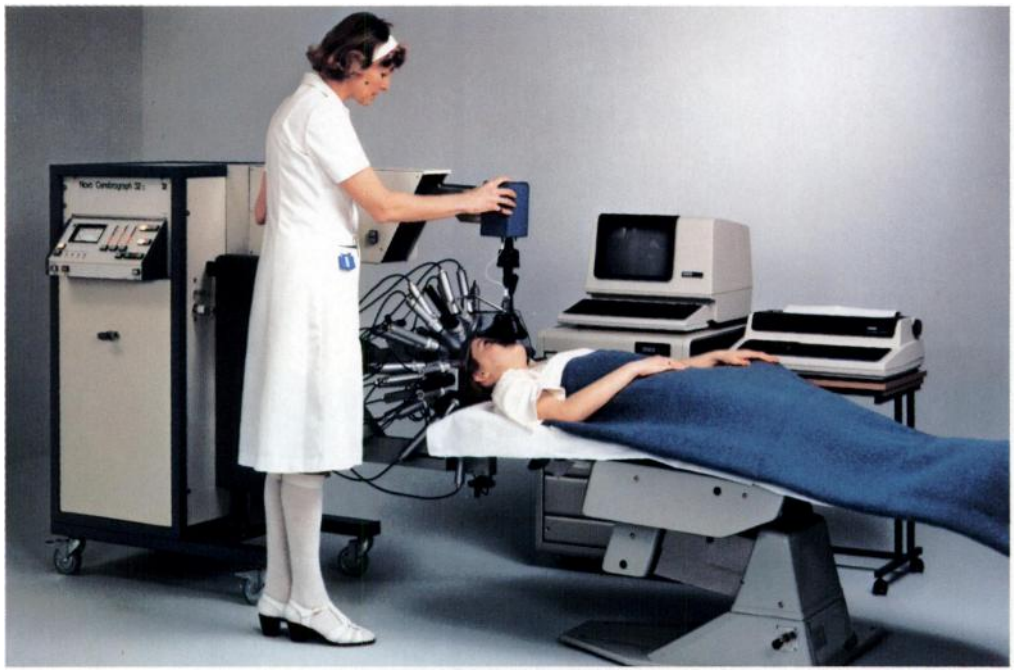
Apex ECT:
Pacesetter of the Tomographic Era.



Elscint Inc. *930 Commonwealth Avenue, Boston, MA 02215, U.S.A. Call Toll Free: 800-343-9504.*
Elscint European Operations, *40 Rue Jean Jaurès, 93170 Bagnolet, France. Tel: (01)362.13.05.*

Another innovation from Novo... The Novo Cerebrograph® 32c

System for measurement of regional cerebral blood flow for use by the neurosurgeon, neurologist, nuclear medicine physician and psychiatrist



Applications

The Novo Cerebrograph® 32c quantifies various hemodynamic and functional changes in the brain through measurement of regional Cerebral Blood Flow (rCBF).

The system's simplicity and accuracy make it a true clinical tool. And Novo, the leading rCBF systems innovator since 1966, has helped create a vast data pool for a broad range of applications.

Useful in CVD, head trauma, migraine, dementia, pre- and post-op evaluation in vascular surgery. Also investigates neurotoxic effects of drugs and organic solvents; studies higher mental function and abnormality.

Novo Is Represented In Major Markets Worldwide.

Features

New helmet-style detector holder for simplified handling and assured reproducibility.

Choice of three ^{133}Xenon techniques—inhalational; IV or IA injection.

A complete system of safety controls.

Comprehensive, clinically verified software package.

On-line and off-line data calculation and varied presentation formats.

Novo Diagnostic Systems
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203-762-2400

Visit us at the SNM Show in St. Louis at Booths 202, 204

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NV-1012

The Radcal
Radionuclide Manager

FEATURES

- Microprocessor controlled.
- Typewriter keyboard entry with isotope selection.
- Integral printer provides internally generated forms on **plain** paper for permanent records.
- Splash-protected design.
- Shielded remote ionization chamber.
- **No** batteries.
- **No** knobs.

MANAGES
MEASUREMENT:

Measures, calculates, and displays. Functions include activity, concentration, decay, calculate dose, check dose, Mo Assay, and quality control.

MANAGES
INVENTORY:

Store, delete and update up to 50 records. Each can contain isotope, calibration factor, half-life, activity, volume and more.

MANAGES
CONTROL:

Self-checking system. Internal clock. Isotopes, calibration factor and half-life may be reassigned. Stored data may be changed to new value. Automatic background suppression.

MANAGES
DISPLAY AND PRINTER:

Two-line, 32 characters per line, dot matrix alphanumeric display. Print data shown on display, entire inventory list, or tickets related to the selected function.

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on the 4000 Series Calibrators contact:

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. . . . THE INNOVATORS OF HEXARRAY™ COLLIMATION

For nearly two decades Nu-Tech has designed and manufactured nuclear imaging collimation. Acclaimed as the industry leader with the Hexarray™ foil collimator line, Nu-Tech now offers scintillation camera detector upgrades and refurbished "total" systems.

Quick Mount™

An ultra modern quick exchange bayonet-lock collimator system with up to 260 KEV imaging capability for Picker, Siemens, and Technicare LFOV cameras.

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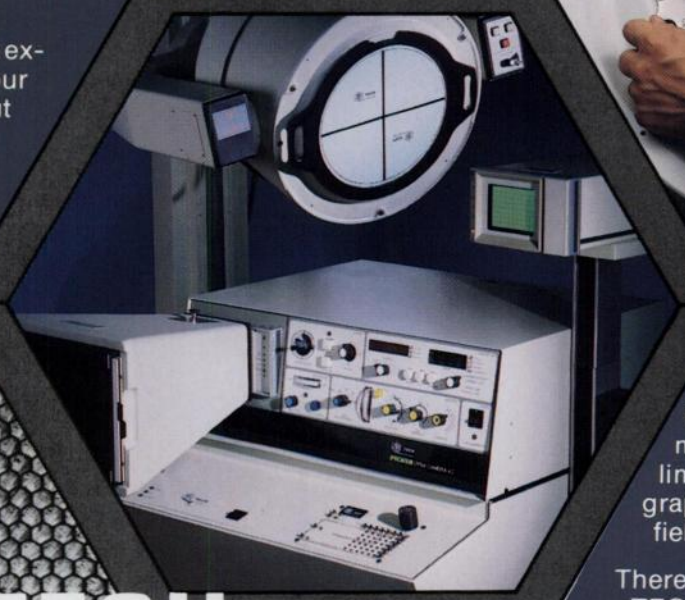

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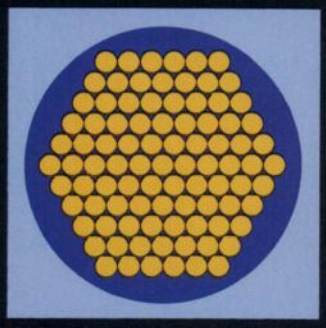

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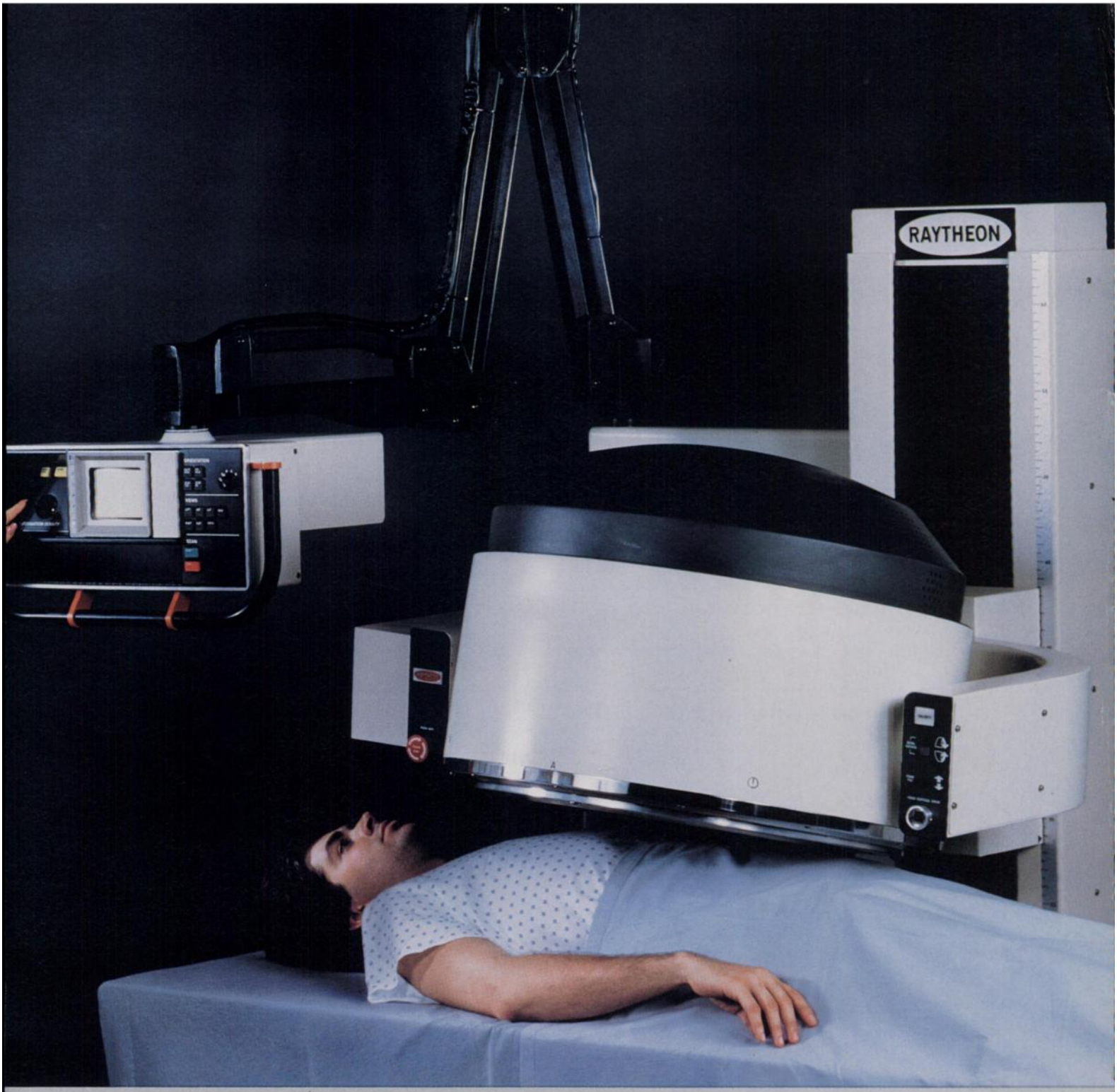

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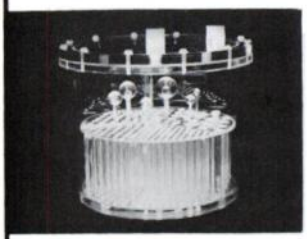

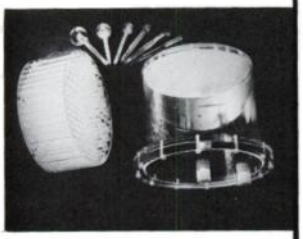

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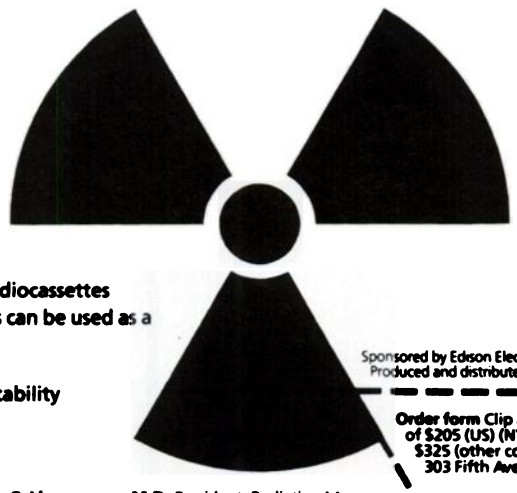

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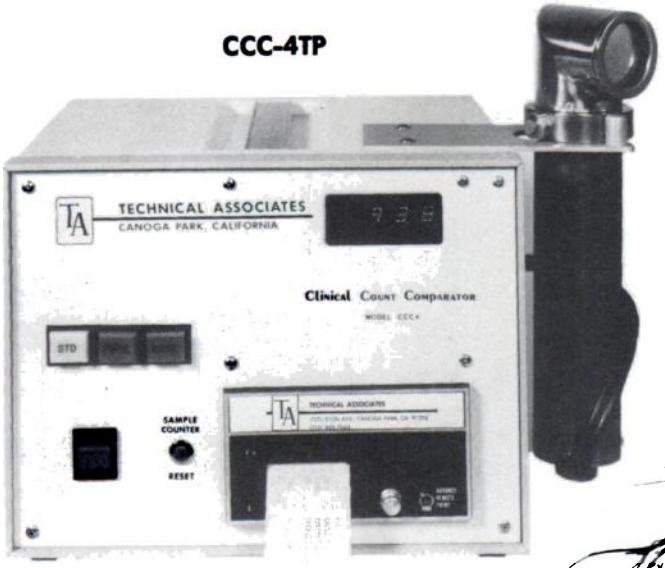

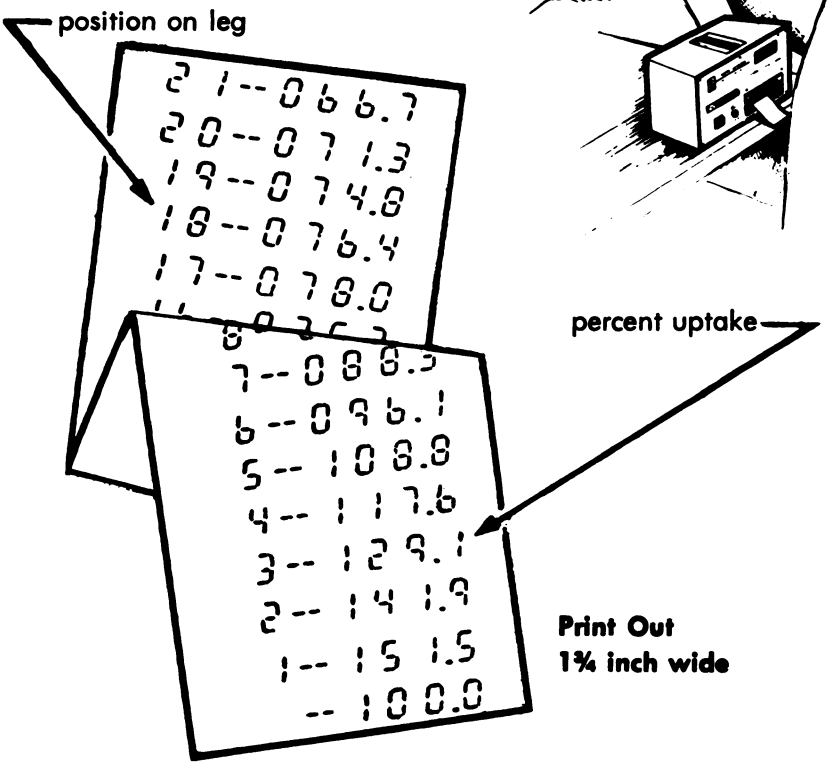

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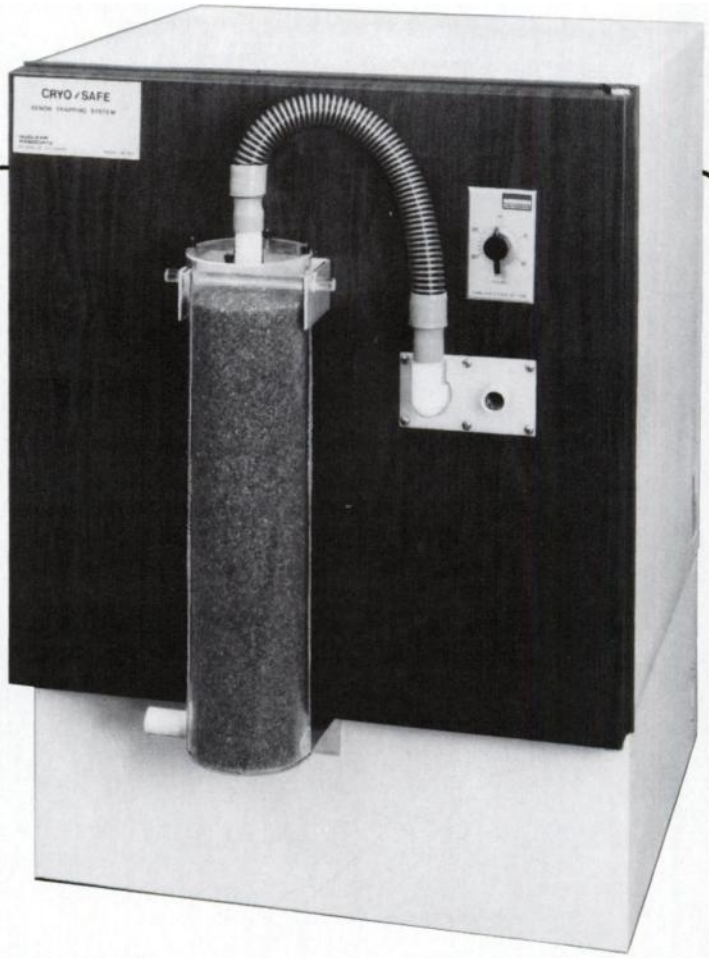

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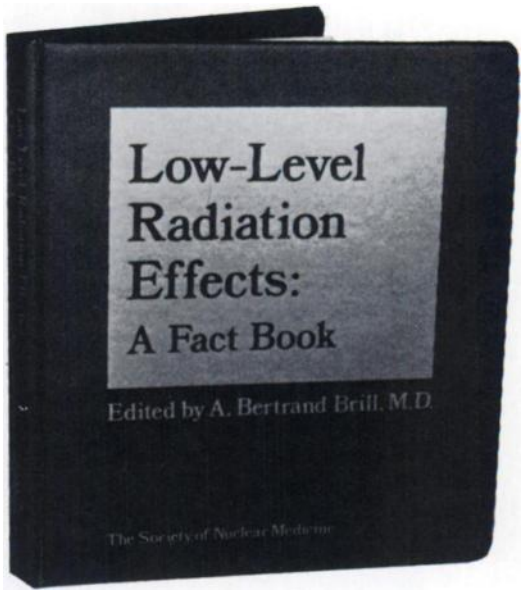

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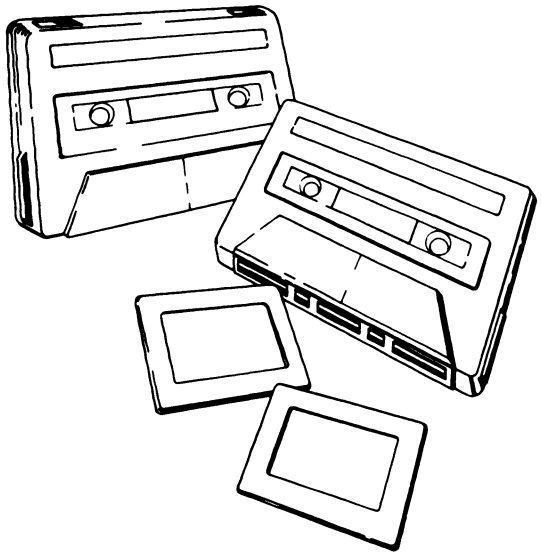

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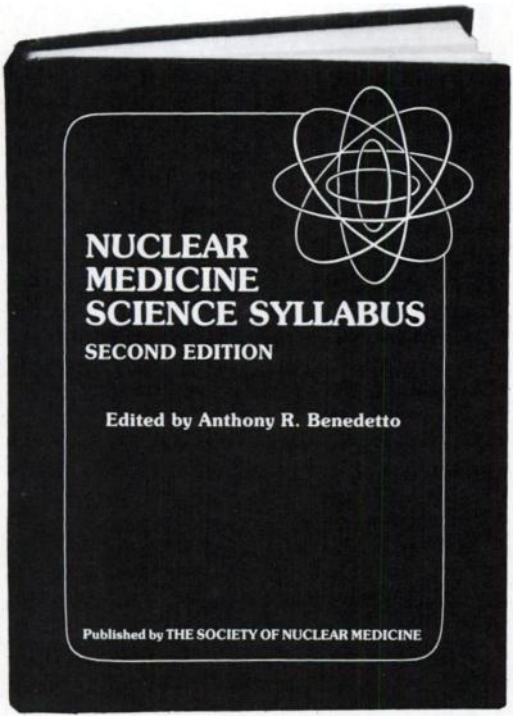

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