If you know get to know

Triosorb®-125 T-3 Diagnostic Kit*

The in vitro test unmatched for reproducibility, convenience and accuracy.

Reproducible. Over 15 million tests conducted over the past eight years have made Triosorb® the standard of T-3 tests.

Convenient. The disposable Triosorb® Kit is ready for immediate use at room temperature making it one of the simplest, most convenient thyroid function tests available.

Accurate. Approximately 15 drugs and conditions produce misleading Triosorb®-T-3 test results, compared with over 200 factors which affect PBI.

* Also available as Triosorb®-131.

Tetrasorb®-125 T-4 Diagnostic Kit

An improved, simplified method for measuring total *serum* thyroxine with diagnostic accuracy equal to or better than any currently used measures of thyroid function. Unlike other tests, exogenous iodines don't affect Tetrasorb® results.

one of these, them all.

The T-7 value completes the thyroid profile.

It's the Abbott method for determining the in vitro free thyroxine index.

T-7 is not a test but a numerical value derived from the multiplication of T-3 and T-4 test values. Because it is a product of two other numbers, the *T-7 value* will *move* only when both the T-3 and T-4 values move in the *same direction.* There are *only* two physiological conditions which cause this to occur, *hypothyroidism* and *hyperthyroidism.* With the exception of those patients receiving liothyronine or d-thyroxine therapy, all other factors which affect thyroid function tests will cause the T-3 and T-4 values to move in opposite directions, and the T-7 value to remain in the normal range.

When you provide the Abbott T-3, T-4 and T-7 values you furnish a complete thyroid profile with unparalleled clinical accuracy.

With LOGIC™ your final step is as easy as 1,2,3.

1. Establish a baseline.
   Pre-set count for 10,000; read the required time from the NIXIE tubes.
2. Take a post-wash reading.
   Pre-set *timer* for the baseline established in step 1.
3. ***Read the percentage uptake*** directly from the NIXIE tubes.
   LOGIC™ provides direct ratio readout in percentage.

   No conversions or calculations needed.
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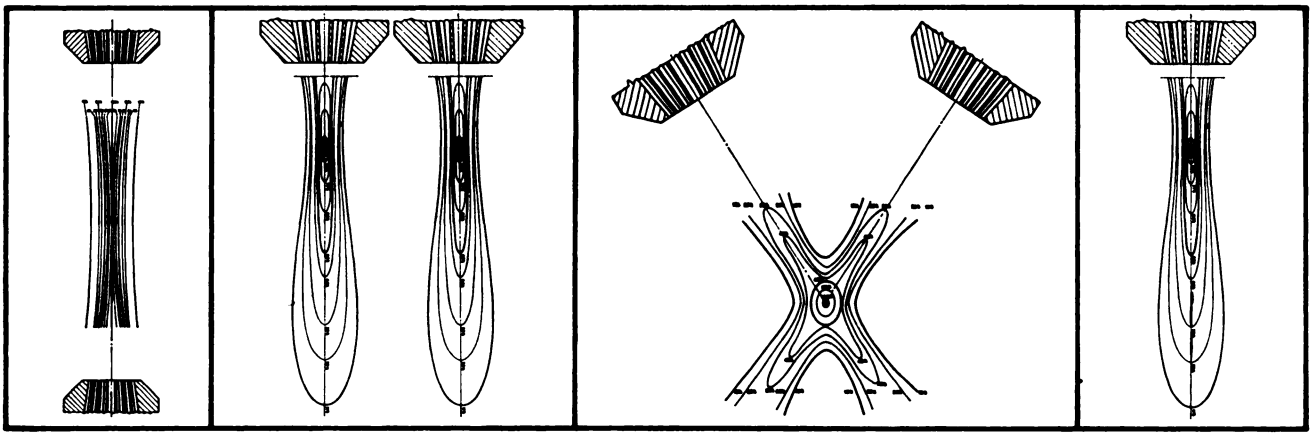

The new Raytheon family of digital scanners provides the ultimate in head placement flexibility. Tomograms, oblique scans of normally masked crania base lesions, and parallel headed scanning of large areas are just some of the clinical possibilities. Of course, Raytheon scanners can operate in the conventional opposed detector position with data subtraction, addition and independent detector operation.

Versatility just begins in detector head placement. Raytheon scanners feature digital data acquisition and manipulation. Four data display channels are available for photorecord and 9-color dot recording, with or without data blending.

Scan set up is simplicity itself – insert the automatic energy selector plug, search for the hot spot, and select a scan speed (up to 600 cm/min) and line spacing, which automatically changes the dimensions of the light aperture. Then you can read out information density and film contrast on a single easy-to-read meter. Raw scan data can be fed to a magnetic tape recorder for subsequent set-up correction – or for that matter, data enhancement or reduction at speeds up to four times as fast as the original.

What's more, Raytheon scanners can adapt to meet your changing clinical requirements. A single 3″ scanner can be hospital converted to a dual 3″, single 5″, or dual 5″.

For more information on the new Raytheon family of nuclear scanners, contact Raytheon Company, Medical Electronics, 190 Willow Street, Waltham, Massachusetts 02154. Tel: (617) 899-5949.

In medical electronics . . . Raytheon makes things happen.

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SYSTEM 70

the first total system for Tc-99m preparation

Here, for the first time, is a truly integrated approach to the preparation of Technetium-99m doses:

SYSTEM/70 offers the convenience and economy of Amersham/Searle's Technetium-99m Generator—combined with the recognized capabilities of the Mediac® Dose Calibrator. Since the dose calibrator is placed in your laboratory with the generator, you enjoy the advantages of both units at a significant saving.

SYSTEM/70 allows you to easily perform the two critical procedures involved in the preparation of Tc-99m, measuring the activity and checking for Mo breakthrough. To learn more about this innovation, mail the handy coupon.

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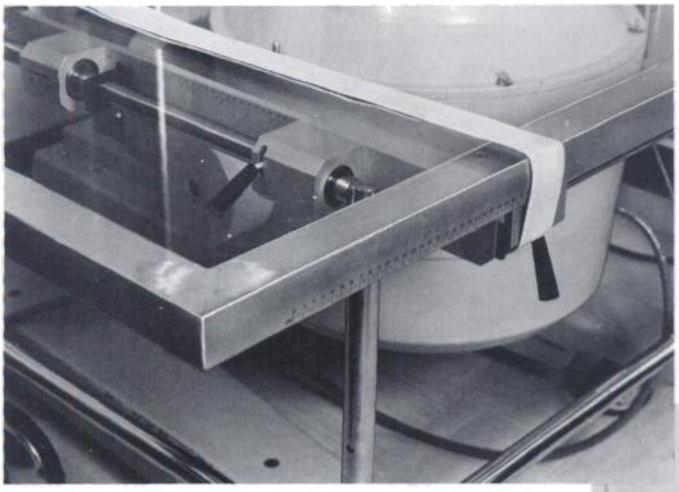
Finally.. THE PGL MODEL 500 A Table for Imaging With a Movable Top



Graduated calibration scale and positive cam locks assures reproducible positioning.

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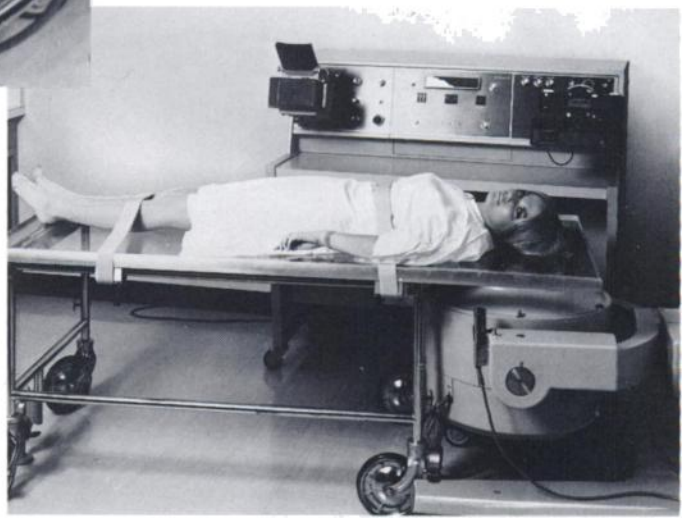

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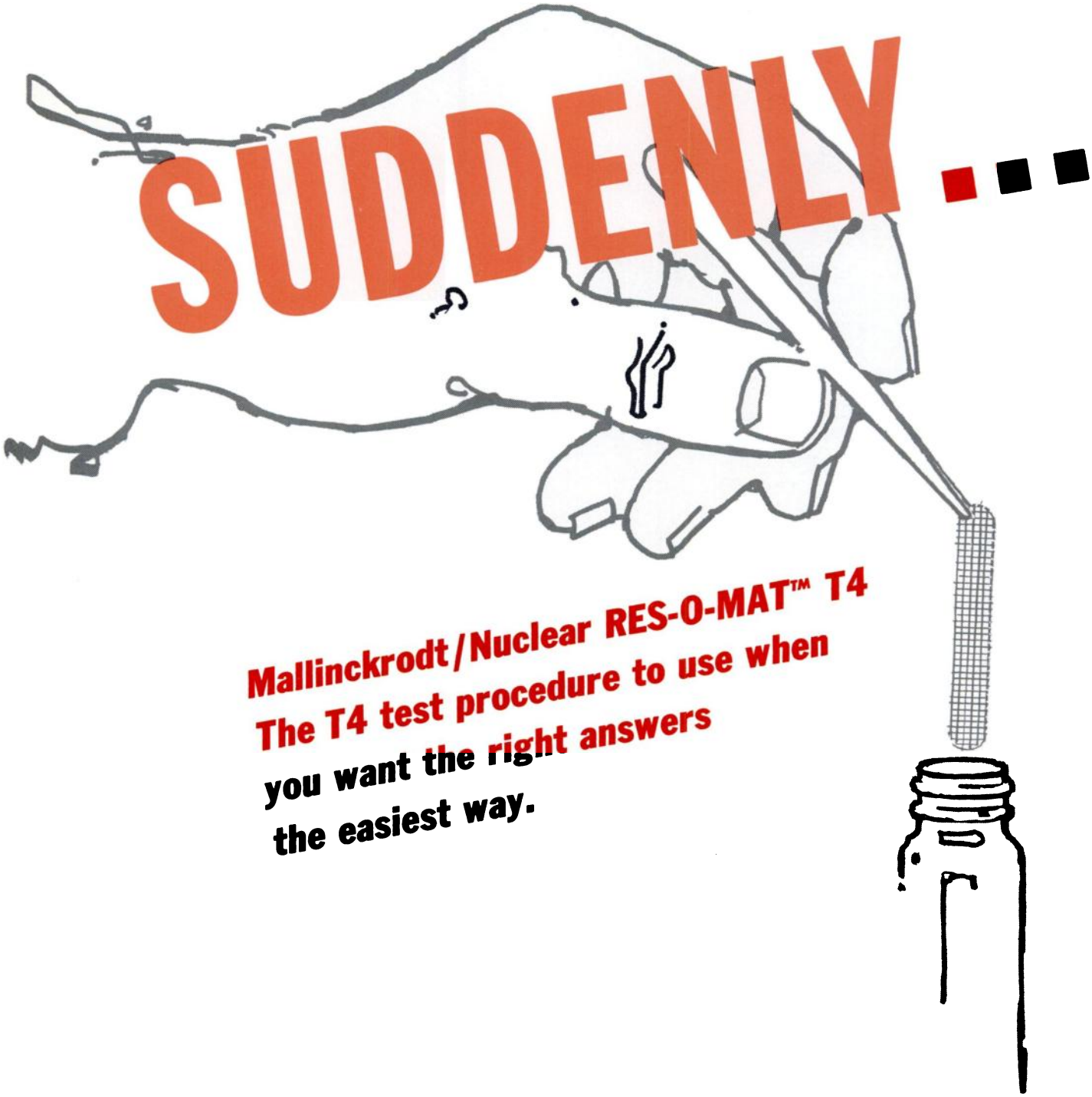
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the easiest way.

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Complete, compact kit contains all materials needed for 10 tests.

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Here's a T4 test that's easy to do, because the exclusive Res-O-Mat™ Strip does all the work. You can determine the T4 value in a few simple steps—no evaporating, no ice bath, no washing—and only one precount for all the tests done with one kit. Time required to perform the test is significantly reduced in comparison to other T4 procedures.

For complete information on the new Res-O-Mat T4 test, mail the coupon at the right.

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Please send information on the new Res-O-Mat T4 Test. Include procedure chart that shows simple steps that save an hour or more technician time.

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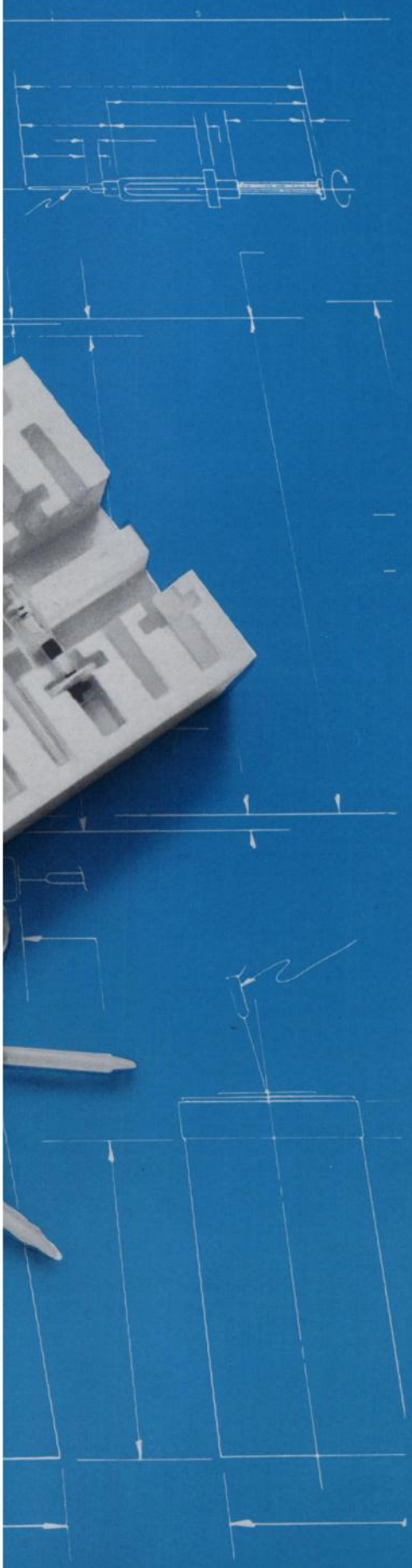


TECHNETOPE® II

Technetium 99m STERILE GENERATOR

the generator for preparing a sterile, non-pyrogenic supply of technetium 99m

TESULOID™

Technetium 99m-Sulfur Colloid KIT

the complete, easy-to-use kit for preparing technetium 99m-sulfur colloid in minutes, as you need it

perfect combination for making ^{99m}Tc-S colloid "when you need it" for liver and spleen scanning

Units designed to complement each other are more likely to produce a better end product. When the Technetope II eluate (with its low concentration of polyvalent cations) is utilized in the Tesuloid Kit, the result is a ^{99m}Tc-S colloid which is well suited for liver and spleen scanning.

Other sources of technetium having a higher concentration of polyvalent cations may produce an unsuitable non-colloid preparation, evidenced by a flocculent precipitate.

Thus, the Technetope II Generator and the Tesuloid Kit provide the perfect combination that gives reproducible results time after time.

See next page for brief summary.

MADE FOR YOUR INDEPENDENCE

now you can make your own ^{99m}Tc-sulfur colloid when you want it...

- utilize ^{99m}Tc eluate from your Technetope II (Technetium 99m) Sterile Generator
- make as many doses as you want when you want

with ease, convenience, and economy...

- keep dollar loss from product decay to a minimum
- store kit anywhere—it's not radioactive

for liver and spleen scanning

- on the basis of 350 case reports from 11 investigators,[1] the technetium-sulfur colloid prepared in this manner was found to be highly satisfactory, and produced liver and spleen scans of good diagnostic value
- no side effects or adverse reactions occurred in any of the cases reported; there was no evidence of pyrogenic or other reactions

the colloid contains no dextran... no rhenium nor other added cation material

Reference: 1. Unpublished data on file at The Squibb Institute for Medical Research.

TECHNETOPE II (TECHNETIUM 99m) STERILE GENERATOR provides a means of obtaining a sterile, nonpyrogenic supply of Technetium 99m (^{99m}Tc), a versatile scanning agent that can be administered intravenously or orally. ^{99m}Tc, the short-lived daughter ($T_{1/2}$ = 6 hours) of Molybdenum 99 (^{99}Mo, $T_{1/2}$ = 67 hours), is obtained from the generator by periodic elution. The amount (in millicuries) of ^{99m}Tc obtained in the initial elution will depend on the original potency of the generator, while the activity obtained from subsequent elutions will depend on the time interval between elutions.

Warning: Proper radiation safety precautions should be maintained at all times. The column containing ^{99}Mo need not be removed from the lead shield at any time. The radiation field surrounding an unshielded column is quite high. Solutions of ^{99m}Tc withdrawn from the generator should always be adequately shielded. The early elutions from the generator are highly radioactive. For radiation protection, a lead shield for the collecting vial is included with Technetope II.

Important: Since material obtained from the generator may be intended for intravenous administration, aseptic technique must be strictly observed in all handling. The stoppers of the eluent bottle, the elution tube, the evacuated collecting vial, and both rubber closures in the generator column should be swabbed with a suitable germicide before entry. All entries into the generator column must be made aseptically. Only the eluent provided should be used to elute the generator. Use a fresh milking tube and collecting vial for each elution; sufficient equipment is provided for this purpose. All equipment used to collect or administer the ^{99m}Tc must be sterile. Do not administer material eluted from the generator if there is any evidence of foreign matter.

Contraindications: Radiopharmaceuticals should not be administered to pregnant women or patients under 18 unless the indications are very exceptional. Since Technetium may be excreted in human milk, it should not be administered to nursing mothers.

TESULOID (TECHNETIUM 99m-SULFUR COLLOID) KIT contains 5 vials (3 cc. each) Sterile Sulfur Colloid Reaction Mixture, 5 Unimatic® Disposable Syringes (2 cc. each) containing Sterile 0.25N Hydrochloric Acid Solution (Syringe A), and 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile Buffer Solution (Syringe B). Each cc. of the Sterile Colloid Reaction Mixture provides 4 mg. sodium thiosulfate, 3 mg. gelatin, 8.5 mg. potassium phosphate, and 0.93 mg. disodium edetate. Each cc. in Syringe A provides 9 mg. hydrochloric acid. Each cc. in Syringe B provides 35 mg. sodium biphosphate and 10 mg. sodium hydroxide.

Warnings: The contents of the syringes (A and B) are intended only for use in the preparation of the ^{99m}Tc-S colloid and are **NOT** to be directly injected into a patient.

As with all radiopharmaceuticals, ^{99m}Tc-S colloid should not be administered to women who are pregnant or who may become pregnant, during lactation, or to patients under the age of 18 years unless the indications are exceptional and the need for the agent outweighs the possible potential risk from the radiation exposure involved. It should be noted that although radiopharmaceuticals are not generally used in individuals under 18, procedures using such agents are occasionally necessary in young patients. Because of the low internal radiation dosage of ^{99m}Tc-S colloid, it should be used in preference to other agents when the liver or spleen scans are necessary.

Formula feeding should be substituted for breast feeding if the agent must be administered to the mother during lactation.

Radiopharmaceuticals should be used only by physicians who are qualified by specific training in the use and safe handling of radioisotopes and whose experience and training have been approved by an individual agency or institution already licensed in the use of radioisotopes.

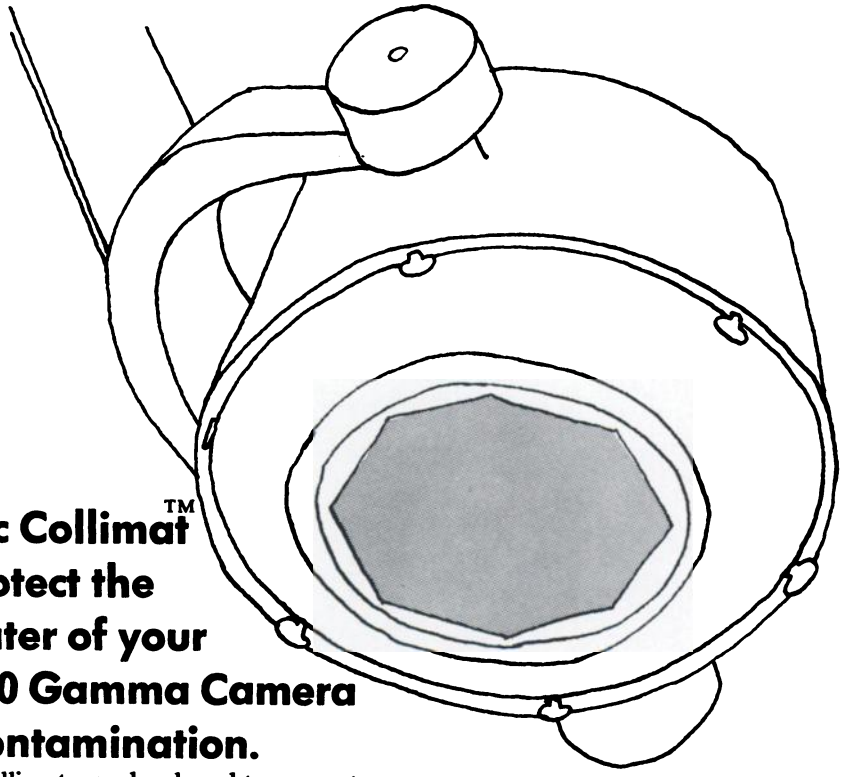
Note: The Tesuloid Kit is not radioactive. However, after the eluted ^{99m}Tc is added, adequate shielding of the resulting preparation should be maintained.

Precautions: As in the use of any other radioactive material, care should be taken to insure minimum radiation exposure to the patient as well as to all personnel directly or indirectly involved with the patient.

Note: The Tesuloid Kit was designed to be used with the sodium pertechnetate eluate obtained from a Technetope II (Technetium 99m) Sterile Generator. The low concentration of polyvalent cations in the Technetope II eluate results in a ^{99m}Tc-S colloid which is suitable for liver-spleen scanning. Use of other sources of sodium pertechnetate having a higher concentration of polyvalent cations may produce an unsuitable ^{99m}Tc-S preparation which is not a colloid; this is evidenced by the formation of a flocculent precipitate. If such a precipitate occurs, the preparation should not be used. It is, therefore, recommended that only Technetope II be used as the source of sodium pertechnetate with Tesuloid unless the user has demonstrated that other sources of ^{99m}Tc are consistently compatible and meet the standards of Technetope II.

For further information, contact your Squibb Representative or the Manager of Customer Service, E. R. Squibb & Sons, Div. of Nuclear Med., Georges Rd., New Brunswick, New Jersey 08903.

SQUIBB Squibb Division of Nuclear Medicine
New Brunswick, New Jersey 08903

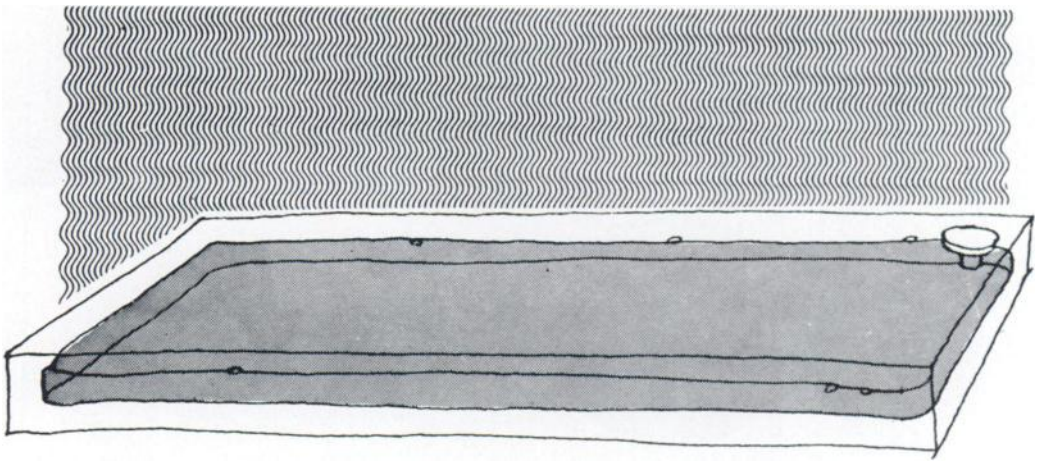


This 29c Collimat™ will protect the collimater of your $100,000 Gamma Camera from contamination.

This new Collimat was developed to prevent any artifacts from coming into contact with the collimater face. It's applied as easy as a bandaid. Strip off backing and adhere to collimater face. When Collimat becomes contaminated peel it off and apply a new one. $30 per 100.

TFS—for uniform crystal flooding and nuclear transmission studies. $85.00

Approximate volume 1500cc.
13½" wide, 16¾" long, 1¼" thick.



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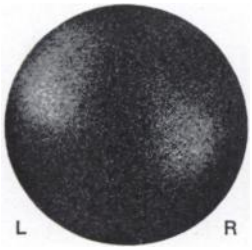
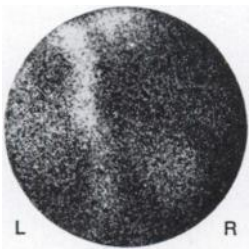
THE PHO/GAMMA SCINTILLATION CAMERA.

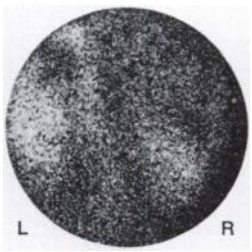
^{197}Hg SCINTIPHOTO.
POSTERIOR VIEW.



^{99m}Tc SERIAL SCINTIPHOTOS.
POSTERIOR VIEW.



0-12 SEC.



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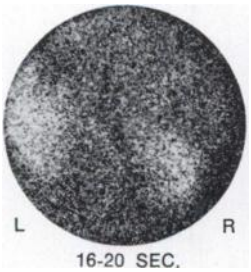

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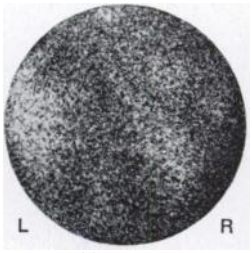

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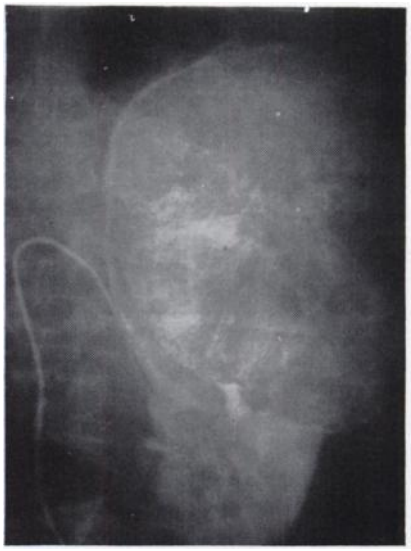

The Renal Study

A Basic Technique for the Evaluation of Kidney Function with the Pho/Gamma® Scintillation Camera

Serial scintiphotography, using ^{99m}technetium pertechnetate, is one of several dynamic techniques for renal study with the Pho/Gamma Scintillation Camera.

SETTING-UP. The patient lies prone beneath the Pho/Gamma detector which is equipped with the low-energy collimator. The lower two-thirds of the patient's abdomen is compressed to decrease kidney motion.

ISOTOPE AND DOSE. To screen for abnormalities, a preliminary static study is performed using ^{197}Hg chloromerodrin. After evaluation of this study and identification of an apparent defect, an intravenous bolus injection of 10 mC of ^{99m}Tc pertechnetate is administered to permit dynamic scintiphotography.

DATA ACCUMULATION. The ^{197}Hg chloromerodrin scintiphoto represents 50,000 counts in a 4-minute period. The serial scintiphotos of ^{99m}Tc in renal transit are taken at selected intervals. This is followed by a static scintiphoto accumulating 300,000 counts.

Alternative dynamic methods of data accumulation could have included: (1) filming of the live-time "fluoroscopic" display on a persistence scope with a Super-8 movie camera, (2) operation of the Pho/Gamma detector in the dual-output mode, with recording of data from each kidney on a dual-channel ratemeter/dual-pen chart recorder, and (3) data recording in digital form on either the Nuclear-Chicago Data-Store/Playback Accessory or the CDS-4096 Clinical Data System. These last two system accessories produce additional qualitative and quantitative data by virtue of their ability to store information for subsequent replaying, processing, and manipulation.

CASE HISTORY. The renal study illustrated on the opposite page is that of a patient with the following history: Female, 58 years old. Dull right-flank pain radiating to right groin of about one-week's duration. No associated hematuria or dysuria.

EVALUATION. The ^{197}Hg chloromerodrin scintiphoto shows very poor activity in the upper portion of the right kidney. The serial scintiphotos demonstrate gradual filling-in of the upper pole of the right kidney.

CONCLUSIONS. The dynamic Pho/Gamma renal study strongly suggests the possibility of a vascular neoplasm in the right kidney.

Confirmation of such pathology was obtained by a selective renal angiogram. As illustrated, a massive tumor is present in the right renal area.

The basic techniques of static imaging to screen for abnormalities followed by serial scintiphotography thus yielded information invaluable to the establishment of a differential diagnosis. Other techniques, utilizing the Pho/Gamma's wide-ranging data-acquisition capabilities, can similarly afford the clinician supplementary data leading to more definitive diagnoses.

Nuclear Reviews

THE DATA-SAVINGS PLAN. Time is a thief. There are not enough hours in your day for immediate, thorough analysis of the wealth of clinical data that a Pho/Gamma can produce.

Our solution: save the data for later with our Data-Store/Playback "time-stretcher." It stores in-vivo time distribution and radioisotope concentration in a 256 x 256 high-resolution digital matrix.

It permits a wide variety of data display, manipulation, and processing possibilities. Learn how to reap the benefits. Write to us for the eye-opening details.

WE MAKE SERVICE CALLS. It won't be necessary often. But if any of our equipment stops doing great things for you—you call, we come. Willingly.

Our service telephone number may be found in your instruction manual or on the back of your Nuclear-Chicago instrument.

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An exchange of information on topics related to nuclear medicine sponsored by

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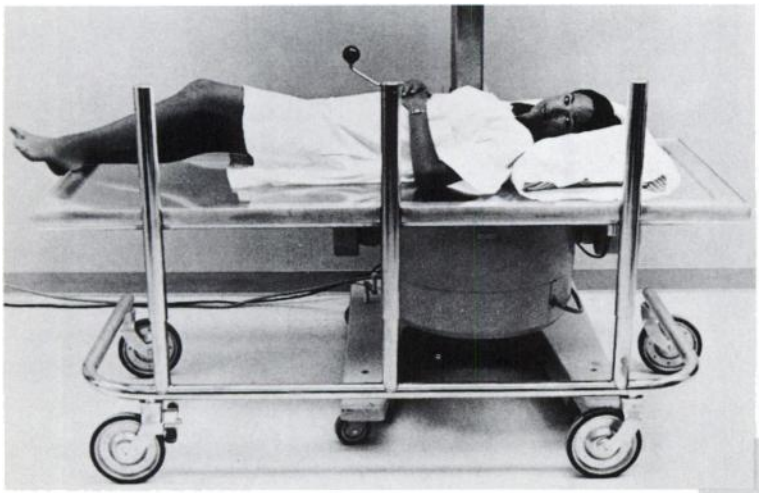
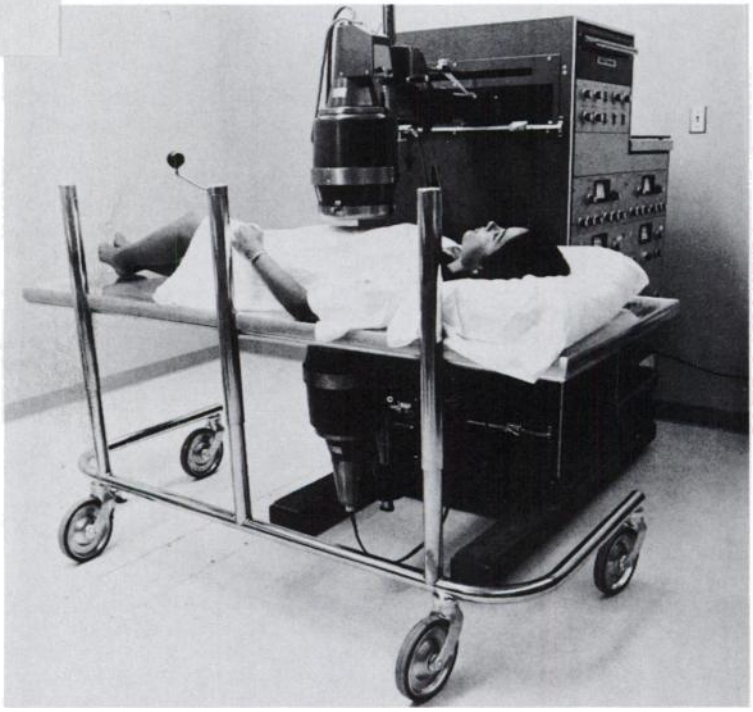


Another new table designed specifically for Gamma Imaging from PGL.



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2) Single & Dual Headed Rectilinear scanners (Nuclear Chicago, Picker, Baird Atomic, Ohio Nuclear, Raytheon, etc.
3) Multidetector Scanners (Dynapix, etc.)
4) Diagnostic X-Ray units.

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CONTINUOUS VERTICAL HEIGHT ADJUSTMENT

- Allows vertical height adjustment with patient on table — convenient & accurate patient positioning.

LUCITE IMAGING TOP

- Transparent — detector head easily positioned below patient for posterior views. Strong—accommodates 400 lbs. and still raises & lowers smoothly. Low-Density—maximum transmission with low energy nuclides.

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- Lucite Top: 72"x30"x½"
- Vertical Height Adjustment: 24" to 36"
- Lower Frame: 64½" long, 28½" wide
- Wheels: 8" diameter chrome finish with conductive rubber tread.
- Finish: Brushed aluminum and chrome.
- Accessories provided: Restraining belt and polyurethane mattress with conductive vinyl cover.

UNOBSTRUCTED FRAME DESIGN

- No crossmembers or support bars to interfere with proper placement of probes, scanner heads, or camera detectors.

MOBILITY

- Large diameter casters to facilitate moving patients to and from department.

FOR FORMAL QUOTATION & ORDERING INFORMATION, CONTACT:
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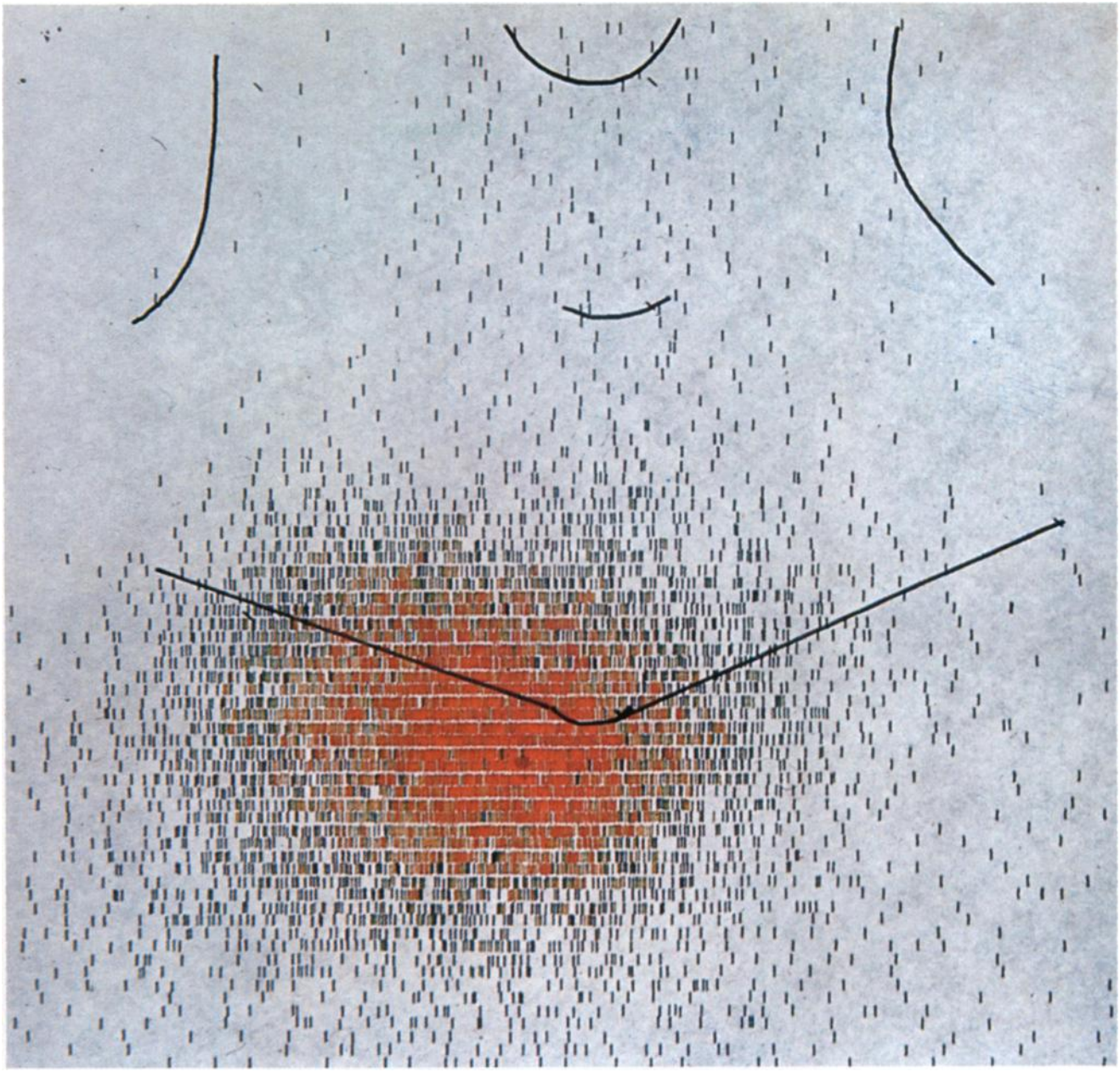

This scan was impossible without Ga67

Of course Ga67 is not the single criterion but it represents a valuable contribution to the diagnosis of bronchial carcinoma, thyroid tumours and systemic (R.H.S.) diseases. By its tumour cell affinity Ga67 produces a high tumour to non tumour ratio. It gives optimal scanning with gamma energies of 92, 185 and 296 keV. Supply is no problem - it is available weekly from Duphar.

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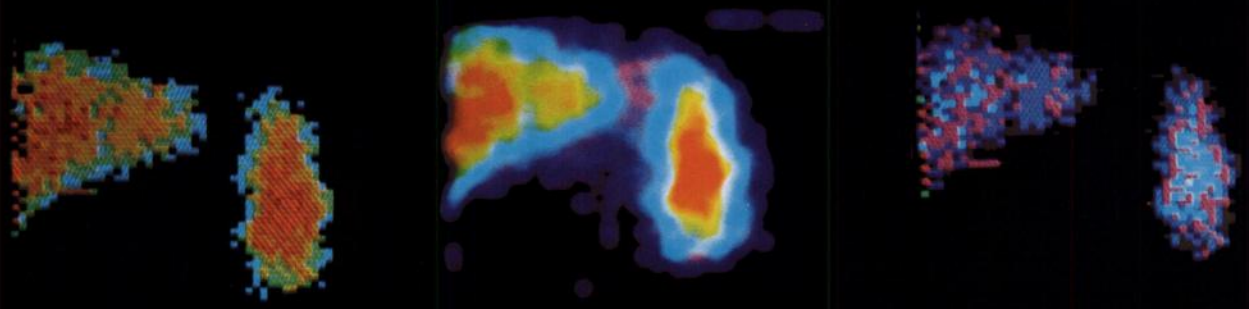
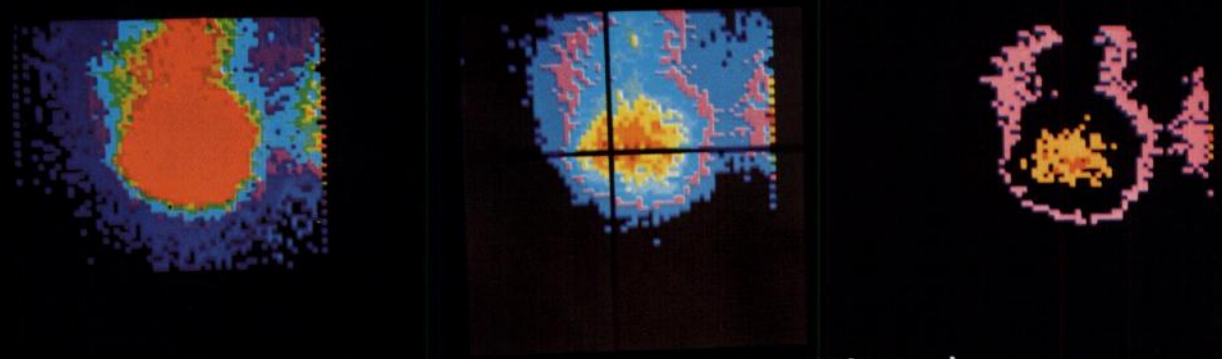
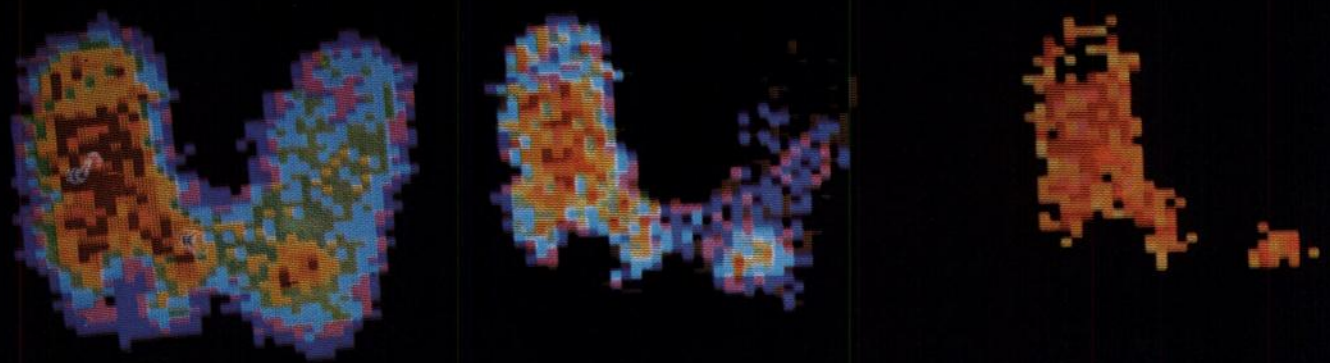


SPLENOMEGALY (^{198}Au)



LIVER ABSCESS (^{113m}In)



THYROID PHANTOM (^{125}I)

Courtesy : Beilinson Hospital
Petah Tikwa, Israel.

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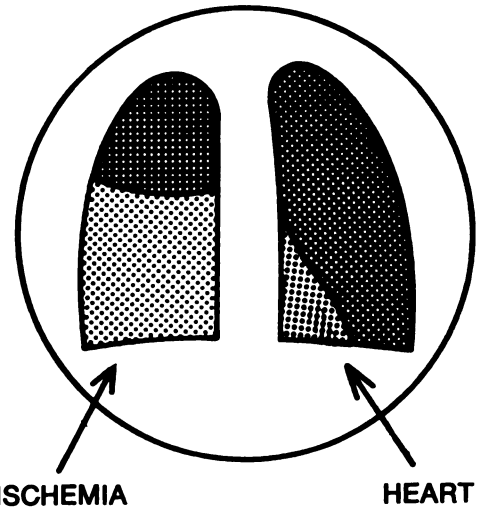

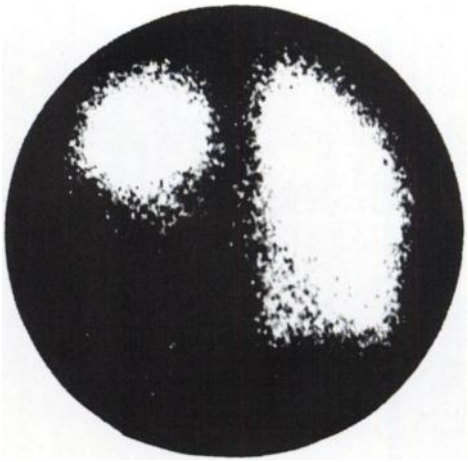

ANTERIOR PERFUSION

"Although perfusion lung scanning has proved clinically useful in the diagnosis of pulmonary embolism, many other disorders that affect ventilation can produce abnormalities of regional pulmonary blood flow. Therefore, some additional test is required for a specific diagnosis of pulmonary embolism." ①

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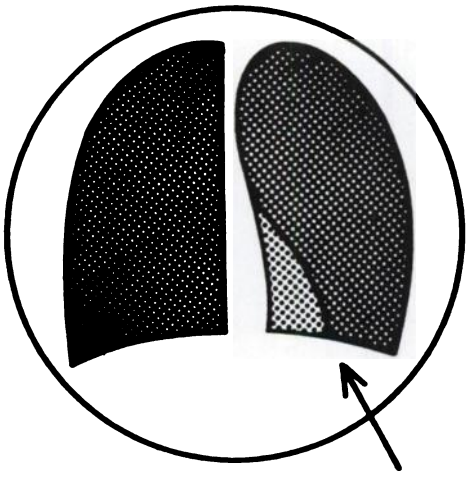

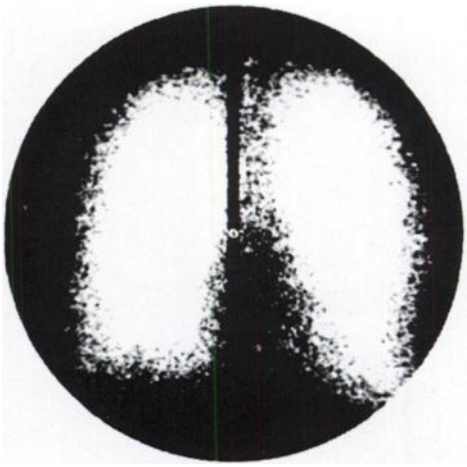

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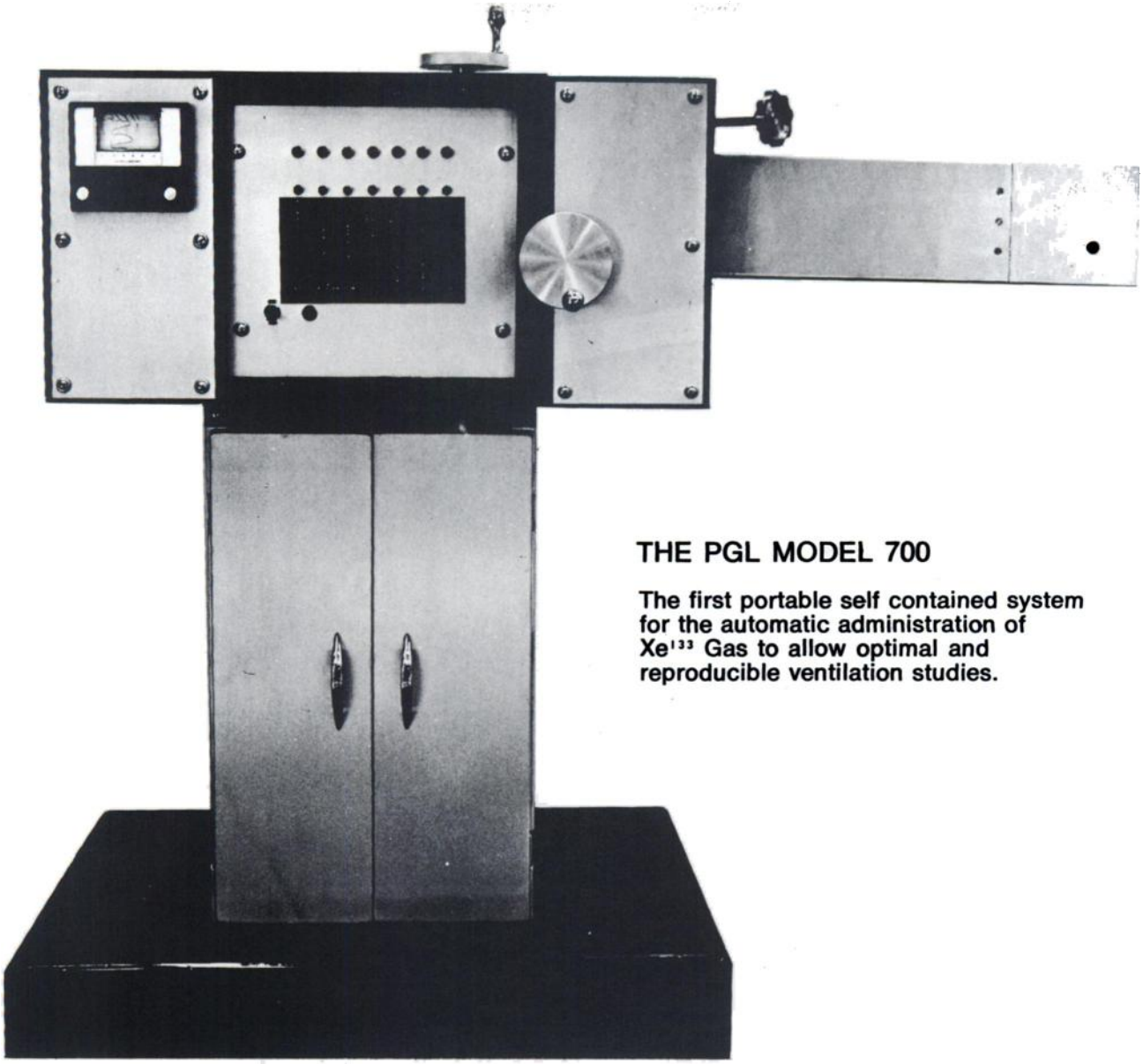
"The Xe^{133} ventilatory lung scan is a simple and sensitive method of distinguishing pulmonary embolism from other causes of perfusion abnormality. In embolism without infarction, the embolic area of the lung appears underperfused but well aerated. This is reflected on lung scans by relatively normal ventilation in association with appreciable perfusion abnormalities. In other pulmonary diseases, the ischemic regions are also poorly ventilated." ②

DE NARDO G.L., et al: THE VENTILATORY LUNG SCAN IN THE DIAGNOSIS OF PULMONARY EMBOLISM. NEW ENG J MED 282:1334-1336 (JUNE) 1970

But how do you administer Xe^{133} Gas accurately, safely and conveniently?



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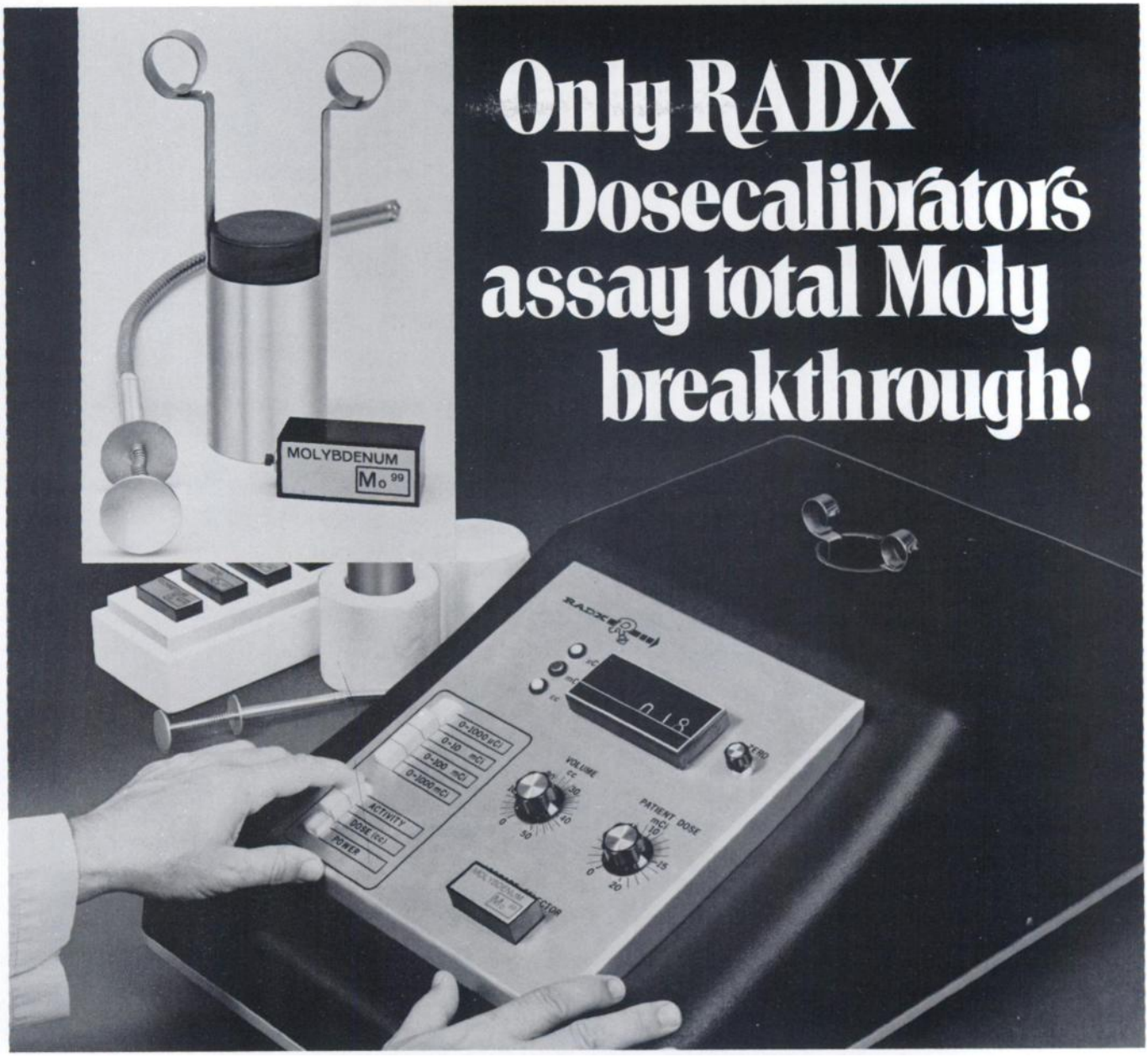

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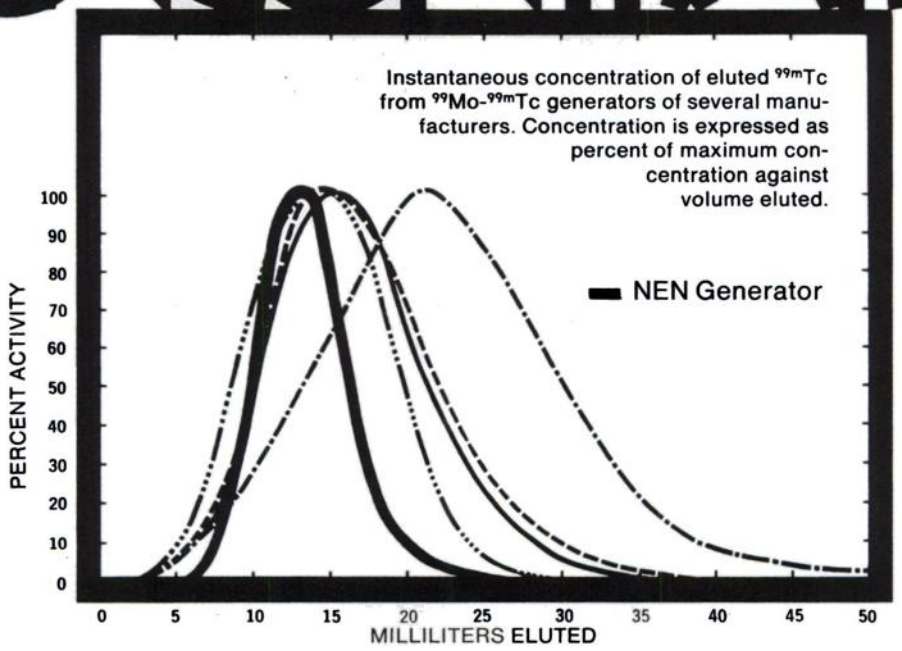

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*Roger D. Tippets and Gordon N. Kenney, "Elution Parameters of the 99Mo-99m Tc Generator," *Journal of Nuclear Medicine*, Vol. 10, No. 8, August, 1969.

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* Henry N. Wagner, Jr., M.D., ConJoint Meeting, Southern & Northern Chapters, Society of Nuclear Medicine, July 19, 1969

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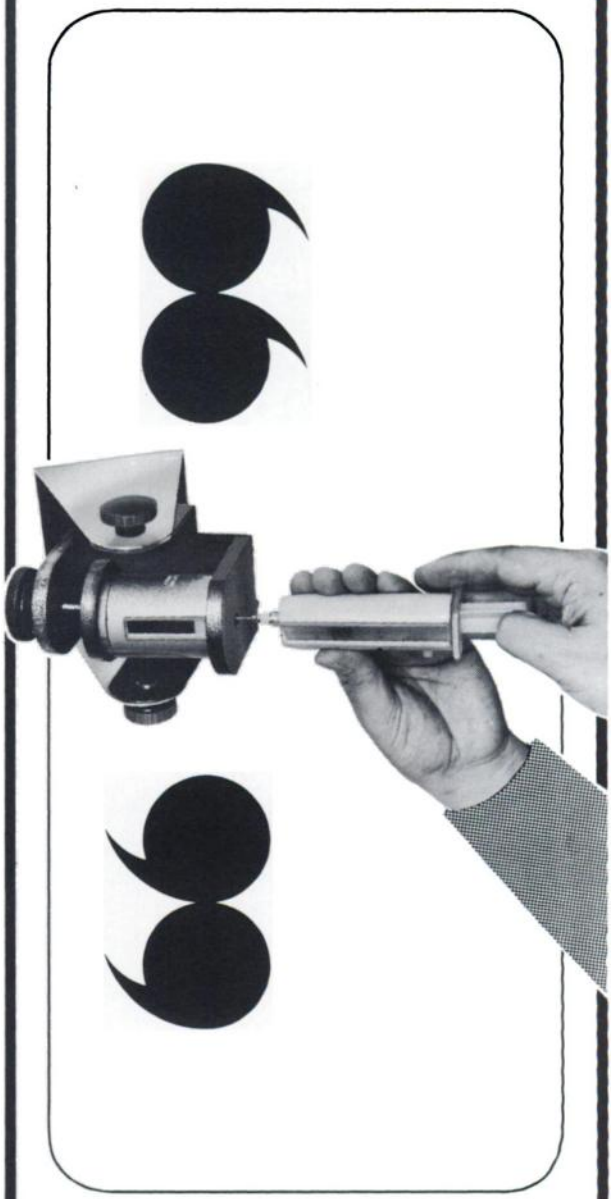

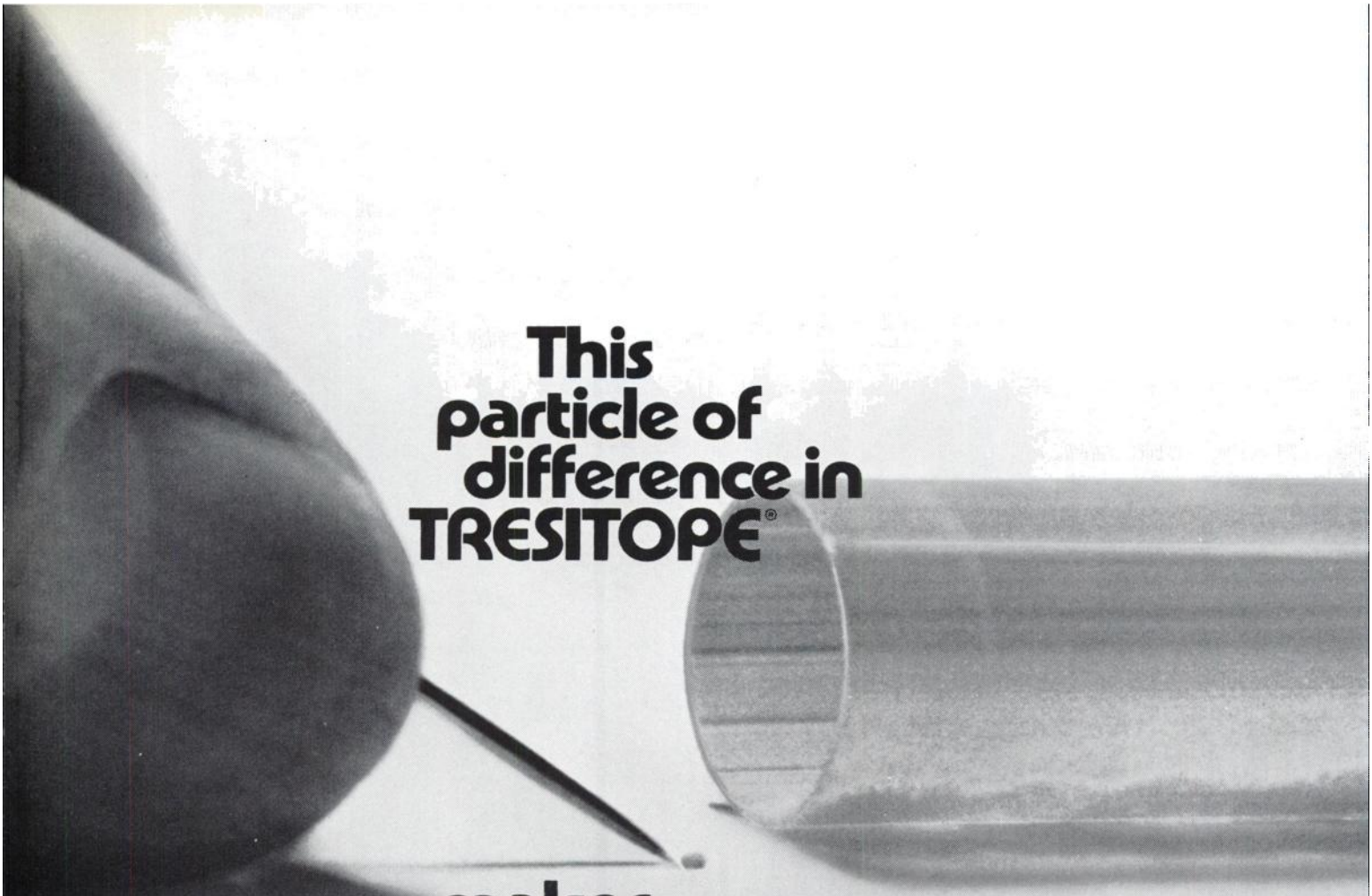

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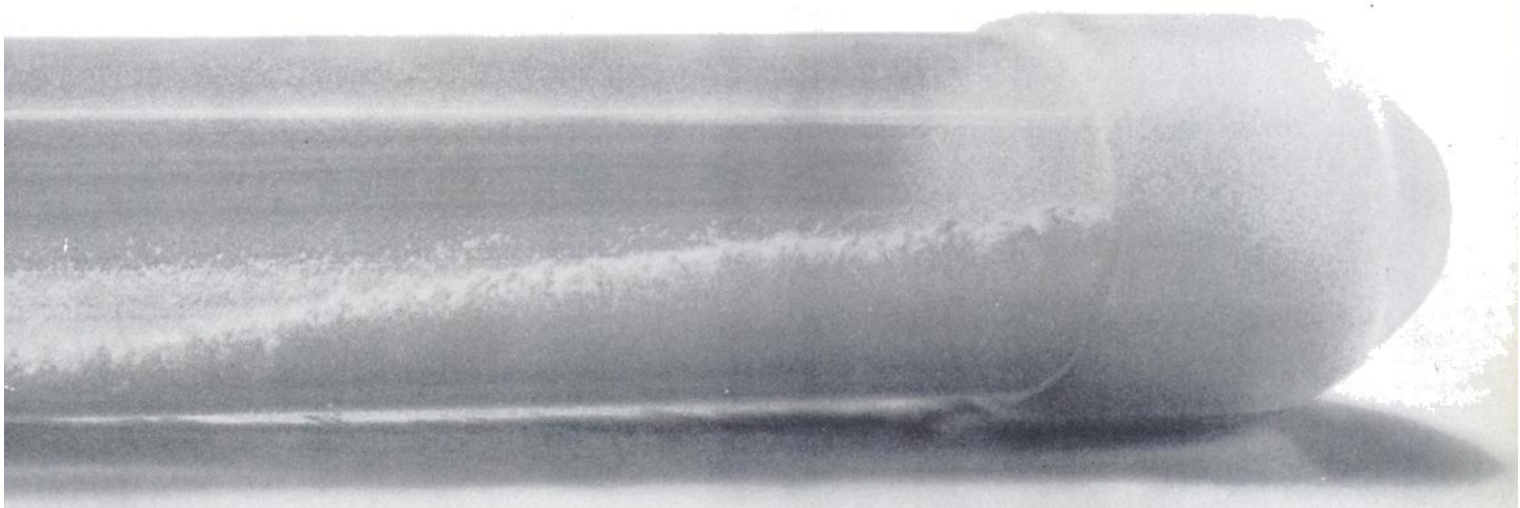
***NOTE:** While the resin uptake test is a very useful aid in the evaluation of thyroid func-



tion, it should not be used as the sole basis for such an evaluation. In any patient, the clinical state is probably the best indication of thyroid status, and *any* laboratory test must be interpreted with caution when test results do not agree with clinical evidence.

There is a Tresitope Diagnostic Kit to meet your needs. The 12-test kit containing 10 light-resistant (amber) vials of solution for serum testing, plus 2 vials for use with reference samples, is designed to save refrigerator space. The vials of radioactive test solution are packaged separately and are the only parts requiring refrigeration. A handy styrofoam platform holds the vials. One end of the platform is modified to facilitate suction washings of the resin powder.

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IMPORTANT

Use appropriate radiation precautions in handling, identifying and discarding all radioactive material. Remember that minute amounts of radioactivity remain on components used in the test, including the styrofoam platform when it is used in performing the test, and particularly when the Tresitope Suction Method is used for a number of tests.

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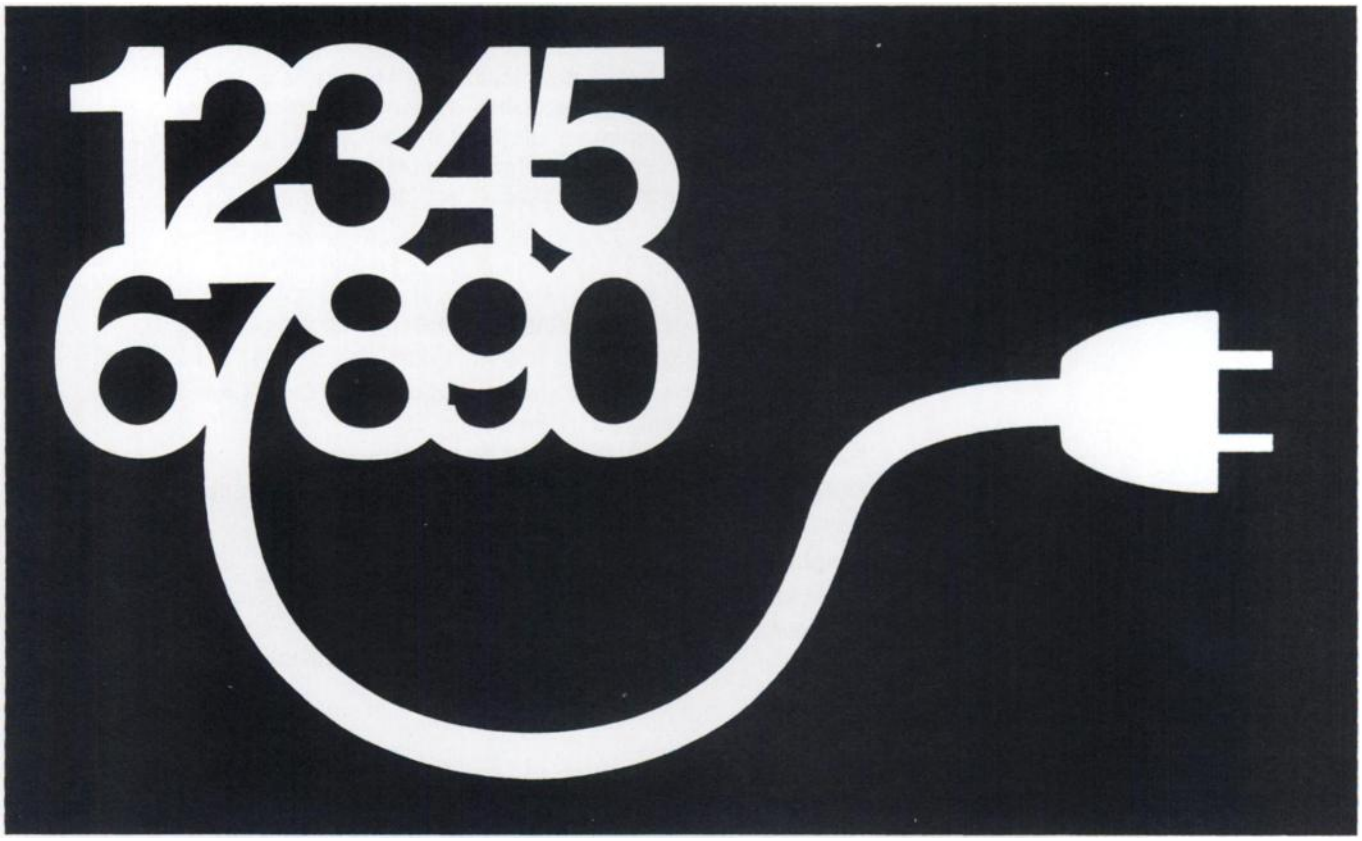

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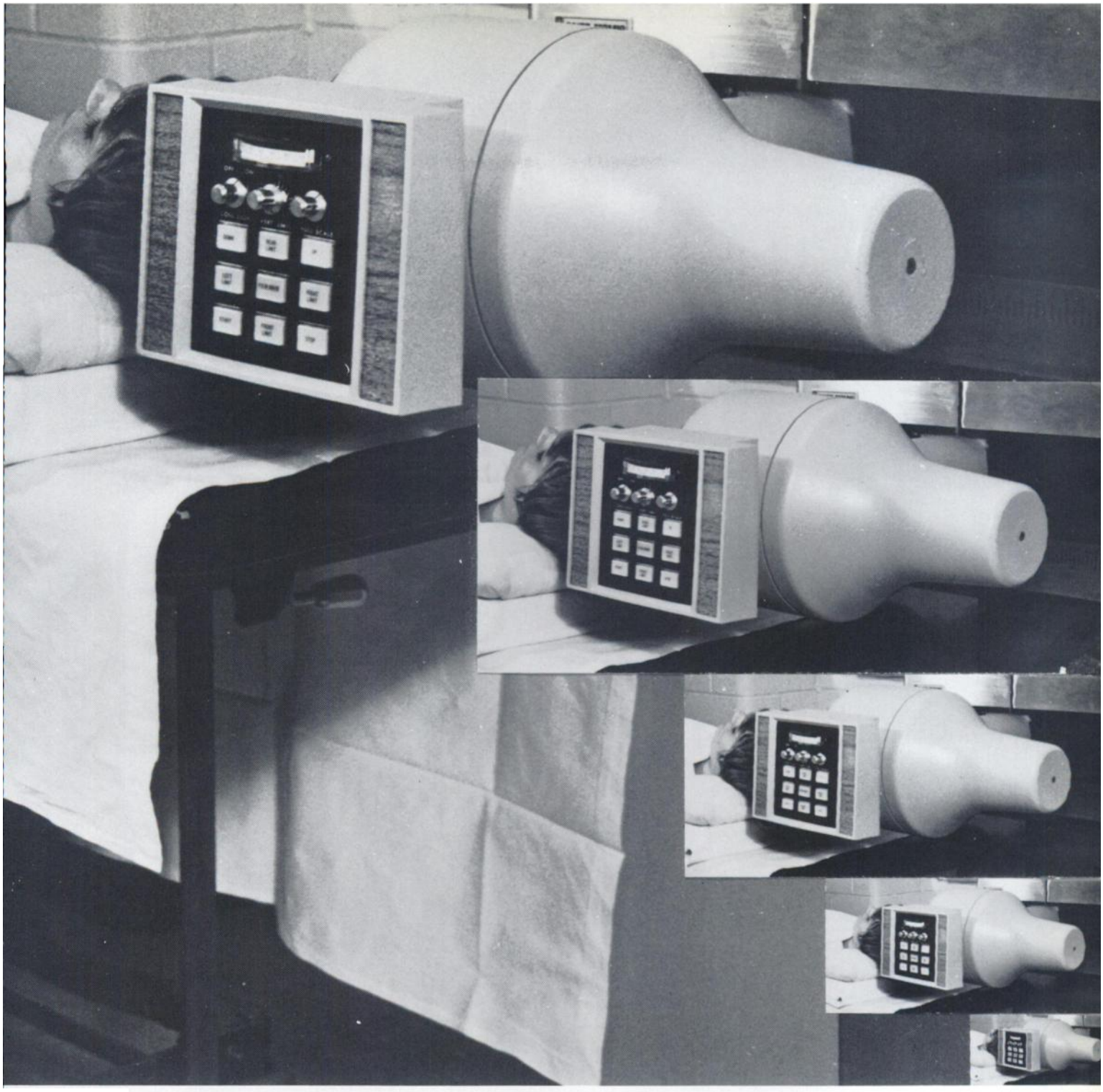

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Edited by John U. Hidalgo

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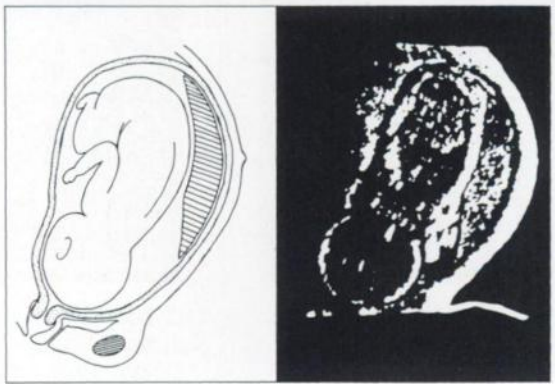
Ultrasonically.



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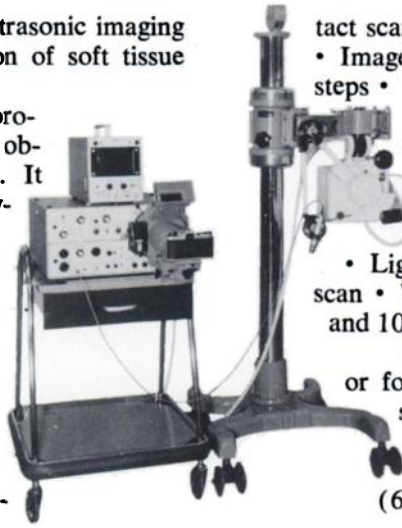

For additional information and pricing, or for the name of your nearest Raytheon sales office, contact Raytheon Company, Medical Electronics, 190 Willow St.,Waltham, Mass. 02154. Telephone (617) 899-5949.

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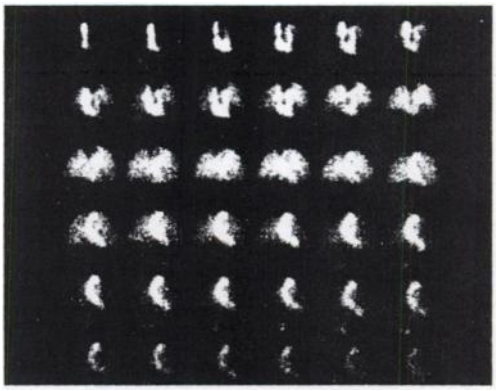
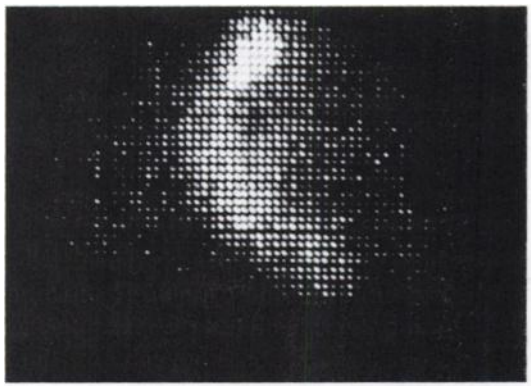
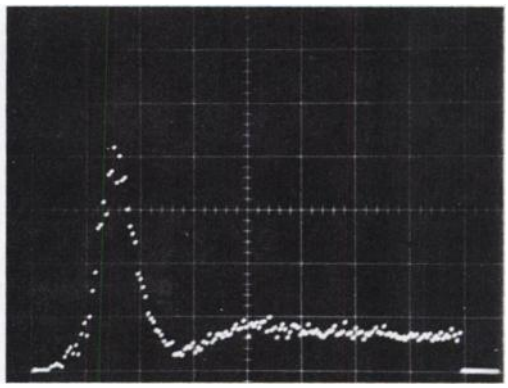
50/50 MED: DIGITAL DYNAMIC CARDIAC FUNCTION STUDY.



36 frame sequence showing cardiac circulation.



Intensified area of interest corresponding to aortic arch.



Dynamics of circulation plotted automatically by computer. Curve shows time/activity over 160 frames.

This dynamic study was recorded in 64 x 64 channel resolution, 160 frames at 0.5 seconds each. The patient was injected with 10mC 99m Tc-m Pertechnetate. Nuclear Data's 50/50 MED recorded each frame on magnetic tape, selected the area of interest, and integrated this area over every frame in the study. Four areas of interest can be selected and plotted automatically. Each curve can include over 1000 time/activity points. Identical studies can be performed on kidneys, lungs, brain, or any other varying phenomena.

The 50/50 MED Digital Image and Processing System provides more diagnostic information from data provided by organ imaging devices. In addition, the system can often provide data without an additional dedicated recording system. Case in point: the above cardiac function study.

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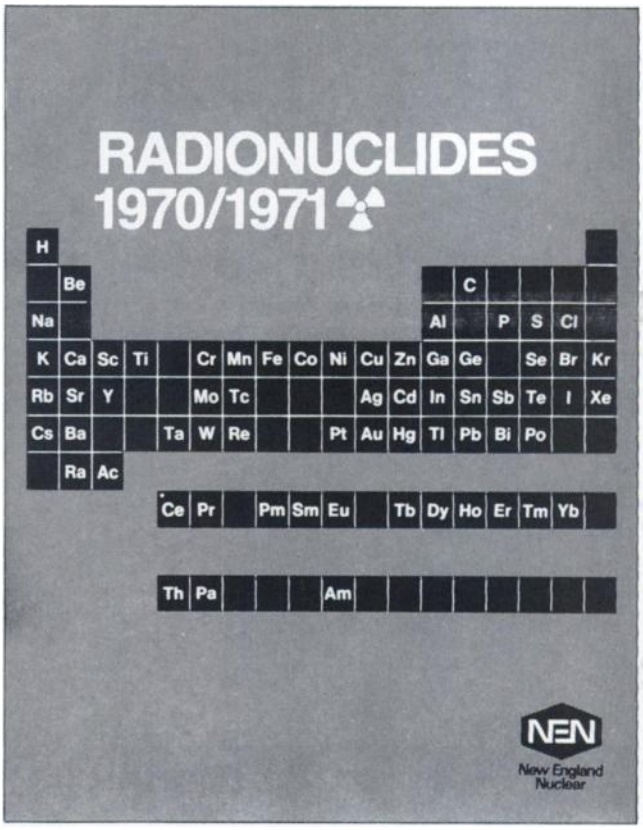

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Squibb takes the mercury out of kidney scanning.

The new Renotec™ Kit.

(Technetium 99m-Diethylenetriamine Pentaacetic Acid [DTPA])

The Non-Mercurial Renal Scan

A convenient, easy-to-use kit for preparing technetium 99m-DTPA—a renal scanning compound that gives you *all* these advantages:

- low radiation exposure to the kidney
- sustained activity in the kidney for conventional rectilinear scans
- doses prepared in minutes, utilizing ^{99m}Tc eluate from your Squibb generator.

After intravenous injection, ^{99m}Tc-DTPA is rapidly cleared by the normal kidney. Sufficient activity remains in the kidney, however, to permit conventional scans at two hours after injection.

Unlike radiomercurial compounds for renal scanning, the much shorter physical half-life of technetium 99m (only six hours) greatly reduces the radiation exposure to the kidney. Toxicity due to DTPA is not a major problem with the dose of chelate administered in subjects with either normal or depressed renal function.

With Renotec, doses can be prepared in minutes, as you need them, utilizing the ^{99m}Tc eluate from your Technetope® II (Technetium 99m) Sterile Generator.

New Versatility For Your Squibb Generator

The Technetope II (Technetium 99m) Sterile Generator provides a means of obtaining a sterile, non-pyrogenic supply of technetium 99m for use with *two different Squibb diagnostic kits:* the new Renotec (Technetium 99m-DTPA) Kit *and* the Tesuloid® (Technetium 99m-Sulfur Colloid) Kit (an easy-to-use kit for preparing technetium 99m-sulfur colloid solution for liver and spleen scanning).

See next page for brief summary.

New Renotec™ Kit
(Technetium 99m-Diethylenetriamine Pentaacetic Acid [DTPA])
The non-mercurial renal scan.

The RENOTEC (Technetium 99m-Diethylenetriamine Pentaacetic Acid [DTPA]) Kit includes: 1) 5 vials (2 cc. each) of Sterile Reaction Solution providing 5 mg. ferric chloride per cc. and 2.5 to 5 mg. ascorbic acid per cc.; 2) 5 Unimatic® Disposable Syringes (2 cc. each) containing Sterile 0.07N Sodium Hydroxide Solution providing 2.8 mg. sodium hydroxide per cc.; and 3) 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile DTPA Solution providing 2.5 mg. diethylenetriamine pentaacetic acid per cc.

The TESULOID (Technetium 99m-Sulfur Colloid) Kit includes: 1) 5 vials (3 cc. each) of Sterile Sulfur Colloid Reaction Mixture providing 4 mg. sodium thiosulfate, 3 mg. gelatin, 8.5 mg. potassium phosphate, and 0.93 mg. disodium edetate per cc.; 2) 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile 0.25N Hydrochloric Acid Solution providing 9 mg. hydrochloric acid per cc.; and 3) 5 Unimatic Disposable Syringes (2 cc. each) containing Sterile Buffer Solution providing 35 mg. sodium biphosphate and 10 mg. sodium hydroxide per cc.

TECHNETOPE II (Technetium 99m) Sterile Generator provides a means of obtaining a sterile, non-pyrogenic supply of technetium 99m as sodium pertechnetate.

Warnings: The contents of the syringes in the Renotec Kit and the Tesuloid Kit should **not** be injected directly into a patient.

Usage in pregnancy—These agents should not be administered to women who are pregnant or who may become pregnant and during lactation unless the indications are exceptional and the need for the agent outweighs the possible potential risk from the radiation exposure involved.

Since sodium pertechnetate ^{99m}Tc may be taken up by the fetus and excreted in human milk, administration of the preparation during pregnancy and lactation is not recommended.

Formula feedings should be substituted for breast feedings if these agents must be administered to the mother during lactation.

^{99m}Tc-DTPA, ^{99m}Tc-S colloid, and sodium pertechnetate ^{99m}Tc should not be administered to persons less than 18 years of age unless the expected benefit outweighs the hazards. It should be noted that although radiopharmaceuticals are not generally used in individuals under 18, procedures using ^{99m}Tc-DTPA or ^{99m}Tc-S colloid are occasionally necessary in such patients. The low internal radiation dosage of ^{99m}Tc-DTPA makes it a very satisfactory agent when scans of the kidney, brain, or blood vessels are necessary in young patients. The low internal radiation dosage of ^{99m}Tc-S colloid makes it a very satisfactory agent when liver or spleen scans are necessary in young patients.

Radiopharmaceuticals, produced by nuclear reactor or cyclotron, should be used only by physicians who are qualified by specific training in the safe use and safe handling of radioisotopes and whose experience and training have been approved by the appropriate federal or state agency authorized to license the use of radioisotopes.

When obtaining elutions from Technetope II (Technetium 99m) Sterile Generator, proper radiation safety precautions should be maintained at all times. The column containing ^{99}Mo need not be removed from the lead shield at any time. There is a high radiation field surrounding an unshielded column. Solutions of sodium pertechnetate ^{99m}Tc withdrawn from the generator should always be adequately shielded. The early elutions from the generator are highly radioactive. **Important:** Since material obtained from the generator may be intended for intravenous administration, aseptic technique must be strictly observed in all handling. The stoppers of the eluent bottle, of the elution tube, and of the collecting vial, as well as both rubber closures in the generator column, should be swabbed with a suitable germicide before each entry. All entries into the generator column must be made aseptically with sterile needles. Only the eluent provided should be used to elute the generator. Use a fresh milking tube and collecting vial for each elution; sufficient equipment is provided for this purpose. All equipment used to collect or administer sodium pertechnetate ^{99m}Tc must be sterile. Do not administer material eluted from the generator if there is any evidence of foreign matter.

NOTE: The Renotec Kit and the Tesuloid Kit are not radioactive. However, after the eluted ^{99m}Tc is added, adequate shielding of the resulting preparation should be maintained.

Precautions: When using radioactive material, care should be taken to insure minimum radiation exposure to the patient (*i.e.*, by using the smallest dose of radioactivity consistent with safety and validity of data) as well as to all personnel directly or indirectly involved with the patient. Before a test is repeated in the same patient, the need should be carefully evaluated; this is especially true in younger patients.

Each elution from Technetope II (Technetium 99m) Sterile Generator should be assayed before use for ^{99m}Tc activity and for the possible presence of ^{99}Mo. Material containing more than 5 microcuries of ^{99}Mo per dose of ^{99m}Tc pertechnetate exceeds Atomic Energy Commission limits and should not be administered. Poor gastrointestinal absorption of an oral dose of pertechnetate and resultant low blood radioactivity levels have been observed in the postprandial state, in seriously ill patients, and in a small number of normal, fasting individuals. Since pertechnetate is concentrated by the gastric mucosa and the salivary glands, secretions of the digestive tract are radioactive and may cause artifacts on the cranial scan. Therefore, all possible care should be taken to avoid extracranial contamination, not only for the protection of patients and of hospital personnel but also to avoid obtaining a falsely positive scan due to extracranial radiation. Any condition which alters the blood-brain barrier or the normal cranial vasculature may cause abnormal areas of increased radioactivity. The brain scan with sodium pertechnetate ^{99m}Tc is therefore likely to be abnormal in patients with scalp contusions or acute head injuries. Following a craniotomy, uptake of radioactivity is increased throughout the operative field, usually for only a few weeks but in some instances for prolonged periods. Since cerebral radiographic techniques temporarily affect the blood-brain barrier, brain scanning with sodium pertechnetate ^{99m}Tc should precede cerebral angiography when possible, or should be postponed for several days thereafter. A negative brain scan does not rule out the possibility of a lesion and should therefore never be considered diagnostically conclusive. Because the normal vascular structures are more apparent on a ^{99m}Tc pertechnetate scan than on a radiochlormerodrin scan, and because the choroid plexus may be visible, it is particularly important to recognize the appearance of a normal brain scan when ^{99m}Tc pertechnetate is used, in order to avoid incorrect interpretation.

NOTE: The Renotec Kit and the Tesuloid Kit were designed for use with the sodium pertechnetate eluate obtained from a Technetope II Sterile Generator. It is recommended that only Technetope II be used as the source of sodium pertechnetate with the Renotec Kit and the Tesuloid Kit unless the user has demonstrated that other sources of ^{99m}Tc are consistently compatible and meet the standards of Technetope II.

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The Hine Reference Phantom offers the simplest, most efficient means of securing optimum camera or scanner performance with respect to depth resolution, uniformity of response, and sensitivity. Changes in instrument output can be delineated quickly, and the best operating conditions can be established readily. The spectrometer window, the display system, the collimator performance, and the total counts can be optimized for a particular application.

The Hine Reference Phantom has a 9" diameter and simulates the physical conditions prevalent for large-organ scanning. With a volume of about 730 ml, it approximates the scattering which has a great effect on the performance of cameras and scanners.

The Phantom can be filled with a solution of a radionuclide chosen according to the application for which the camera or scanner should be tested. Typically, 300 μCi of I-131 or 1 mCi of Tc-99m are used most frequently.

76-800 Hine Reference Phantom.....$150.00

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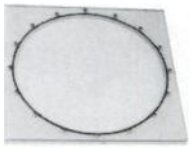

Approx. 1 mCi of Tc-99m is placed in the cavity (13.5" diameter x 0.5" deep). When the Tc-99m is evenly distributed over the entire phantom, the camera's uniformity of response can be determined.

76-805 Flood Phantom.....$ 00.00

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INDEX TO ADVERTISERS

Abbott Laboratories
North Chicago, Ill. ..... IFC, i, xx

American Cancer Society
New York, N.Y. xxxvii

American Medilease
New York, N.Y. xxx

Amersham/Searle
Arlington Heights, Ill. iv

Atomic Development & Machine Corp.
Plainview, N.Y. xxvii

Baird Atomic
Bedford, Mass. ..... xxxiii, xxxxiv, IBC

CDS
Centereach, N.Y. xiii

Conuclear, Ltd.
Winnipeg, Manitoba, Canada xxiv

Philips Duphar, N.V.
Petten, The Netherlands xvii

Elscint, Ltd.
Haifa, Israel ..... xviii, xix

International Instruments
Emerson, N.J. xxxii

Mallinckrodt/Nuclear
St. Louis, Mo. ..... viii, ix

New England Nuclear
Boston, Mass. ..... xxvi, xxvii, xxxvii

Nuclear Associates
Westbury, N.Y. xxxxii

Nuclear Chicago
Des Plaines, Ill. ..... xiv, xv, BC

Nuclear Data, Inc.
Palatine, Ill. xxxvi

Ohio-Nuclear, Inc.
Mentor, Ohio xxi

Pako Corp.
Minneapolis, Minn. xxxvii

PGL—Instruments & Services for Medicine
San Francisco, Calif. ..... vii, xvi, xxii, xxiii, xxxxi

Picker Nuclear
North Haven, Conn. ..... xxxi, xxxiv, xxxxiii

Radx Corp.
Houston, Tex. xxv

Raytheon, Inc.
Boston, Mass. ..... ii, xxxv

SNM Placement
New York, N.Y. 147

Squibb, E. R. & Sons
New Brunswick, N.J. ..... x, xi, xii, xxviii, xxix, xxxviii, xxxix, xxxx

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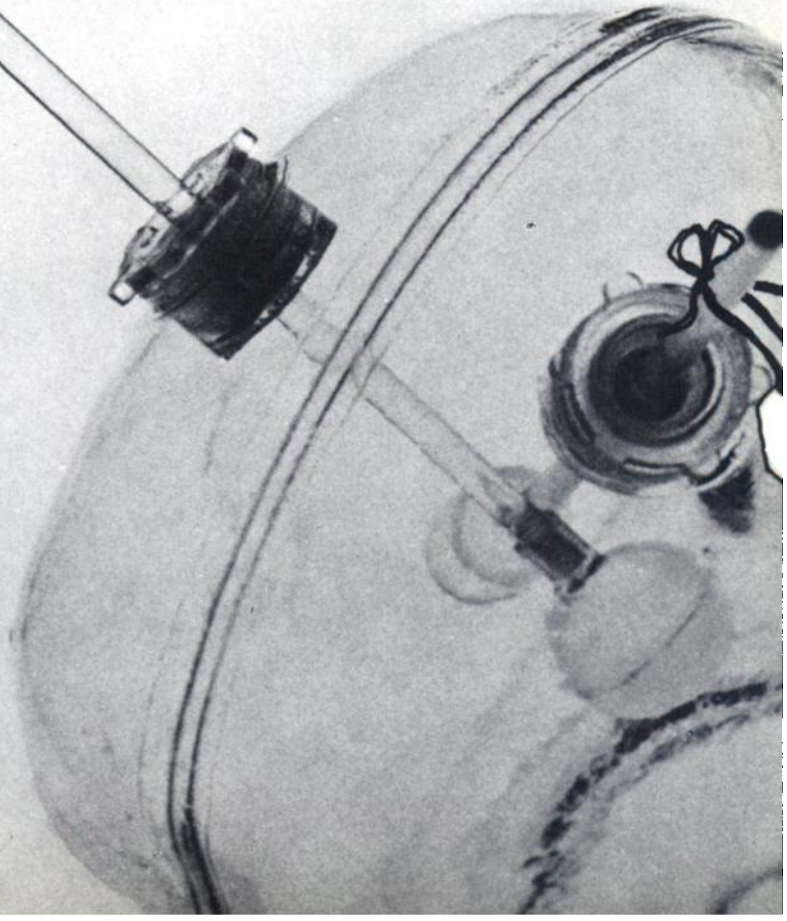

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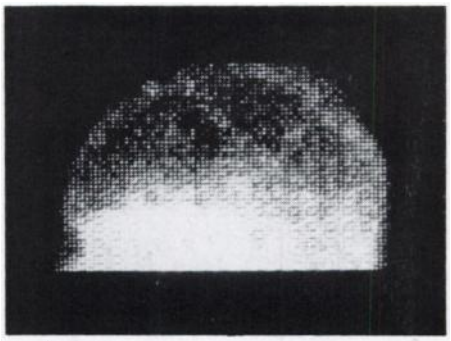
The Baird-Atomic Scintillation Camera: a new kind of image.

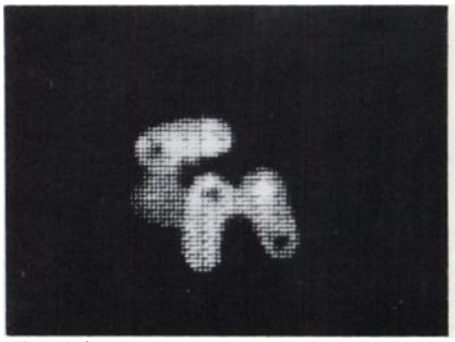
By Johan Govaert and Frank Troiani

One of the traditional problems with scintillation cameras — B/A's included — has been image. And, of course, everyone in the field has been working on it. Here are some remarkable results from the work at Baird.

Finger Phantom
50 MC
133m Barium

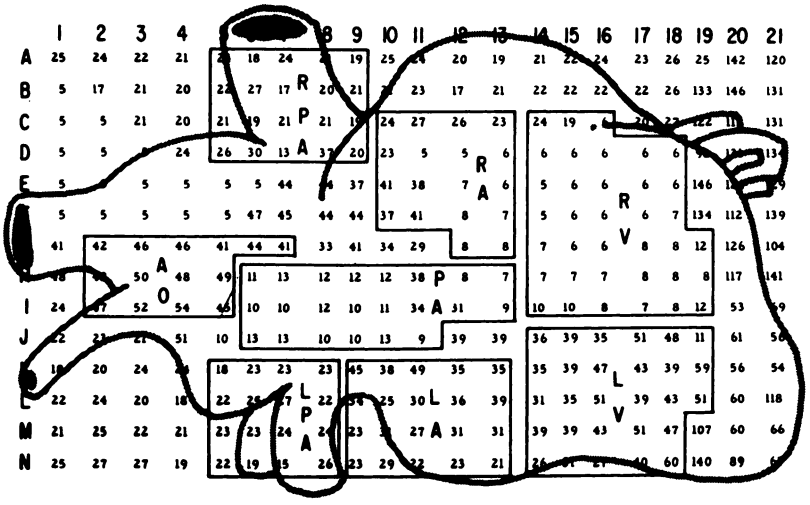


Brain Scan

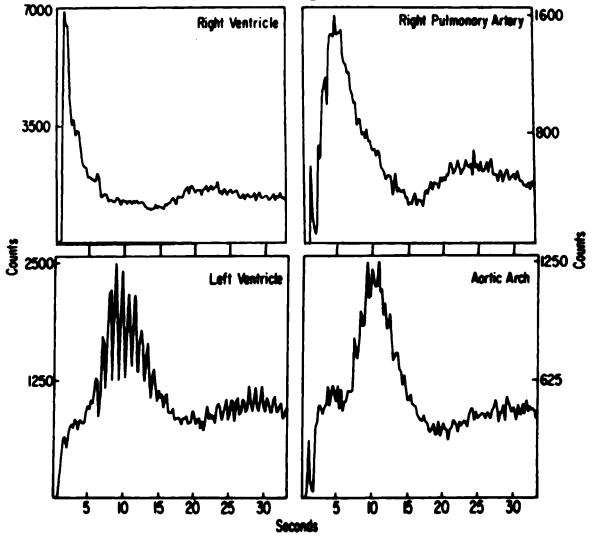


Thyroid Phantom
50 MC
133m Barium

RADIONUCLIDE ANGIOCARDIOGRAM TIME OF MAXIMUM COUNT



Radionuclide Angiocardiographs for areas selected.



Notice the phantom and brain scan images to the left. They say a lot about the Autofluoroscope's® new image. Quite frankly, we don't think there's another camera that can get this resolution at all energies.

It means that patient data, even large organs, are imaged with resolution of 2-3 millimeters. Even at 16 centimeters from the detector the Autofluoroscope's resolution is less than one centimeter.

It represents, of course, a significant step forward.

Another example: the quantitative angiocardiogram. It utilizes the computer and Baird-Atomic's extensive portfolio of computer programs. (All data has been corrected for detector uniformity and instrument dead-time.)

Time progression of a 10 mCi $99^{m}Tc$ bolus passing through the heart: time units in 0.2 seconds when maximum counts occurred for each element in the matrix over the duration of the study.

To the right of the initial computer print-out are radionuclide angiocardiographs for areas selected. Notice that all pertinent cardiac time parameters are evident from these curves. (Data was accumulated at a rate of 0.2 seconds per frame.)

Now let's look for a moment at another dramatic demonstration of the Autofluoroscope's capabilities: a blood flow study, performed by Dr. Bernard Mongeau, Hotel Dieu de Sherbrooke, Sherbrooke, Canada, and James McCoo, South Chicago Community Hospital.

The study was performed using 10 mc $99^{m}Tc$ Pertecnetate I-V injected as a bolus. The Autofluoroscope accumulated the information at the rate of 1 frame per second. Based on the curve data, the diagnosis was reported as positive with "incomplete obstruction of the left internal carotid (left carotid insufficiency)."

We have used this space to show you the kind of advances that we are building into the Autofluoroscope. To tell you that if you're looking into scintillation cameras, you should have the Autofluoroscope in mind. (Incidentally, the improvements discussed here can be readily installed in existing Autofluoroscopes.)

Naturally, you'll have questions. And also naturally, we have the answers. Abundantly. Write or call.

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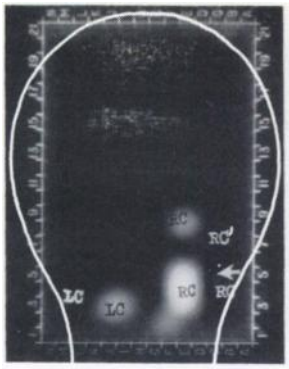
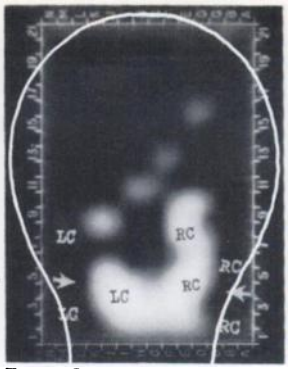
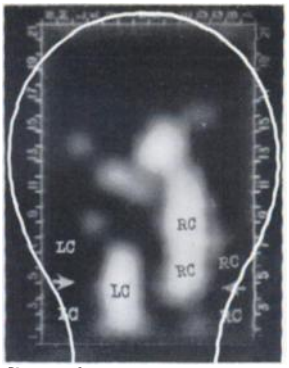
Quantitative Cerebral Blood Flow Study — using the clinical screening method.



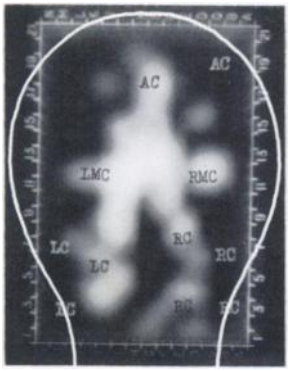
Frame 1



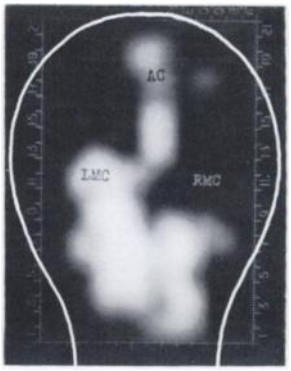
Frame 2
• NOTE: point of obstruction confirmed by angiogram.



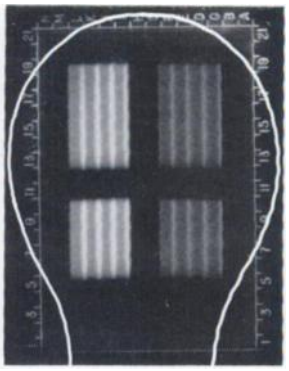
Frame 3



Frame 4



Frame 5

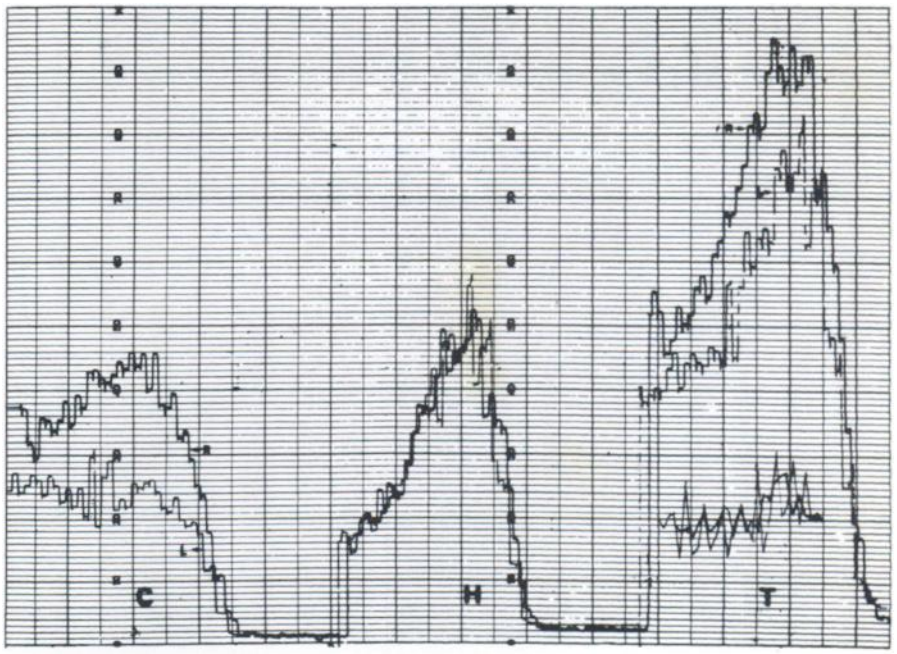


Area Flagging

Legend

AC — Anterior Cerebral
LC — Left Carotid
RC - Right Carotid
LMC — Left Middle Cerebral
RMC — Right Middle Cerebral
W — Circle of Willis

Cerebral Blood Flow Plots — 1000 counts full scale.



Cerebral Blood Flow
Analysis of the curves: parameters used.

1. Peak Activity A. Time from cervical to maximal cerebral perfusion (N: 7-10 sec.; symmetrical within 3 sec.) B. Amplitude height ($\pm$ 2 S.D.)
2. Transit Time is determined by the first derivative method of Oldendorf.
3. Breakdown of Curve showing total blood flow into 2 curves showing: A. Hemispheric Blood Flow — Equal. B. Cervical Blood Flow - Reduced on left side.

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