Xenon

Xenon Xe 133

How you like it
When you like it
MPI Xenon Xe 133 is now available in four product configurations—from unit dose to bulk:

- Ventilation Study System (V.S.S.)
- 10 mCi vials
- 20 mCi vials
- 1.3-1.7 Ci ampules (crushable and break-sealed)

When you like it

MPI Xenon Xe 133 delivery and calibration schedule—utmost convenience and optimal product use:

<table>
<thead>
<tr>
<th>Product</th>
<th>1st Rec.</th>
<th>Calibrated</th>
<th>12:00 Noon</th>
</tr>
</thead>
<tbody>
<tr>
<td>V.S.S.</td>
<td>Monday</td>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>10 &amp; 20 mCi vials</td>
<td>Monday</td>
<td>Thursday</td>
<td>Monday</td>
</tr>
<tr>
<td>1.3-1.7 Ci Ampules</td>
<td>Monday</td>
<td>Prior Friday</td>
<td></td>
</tr>
</tbody>
</table>

For complete prescribing information consult package insert, a brief summary of which follows:

Xenon Xe 133-V.S.S. for the study of pulmonary ventilation.
Xenon Xe 133 Gas Ampule & MPI Xenon Xe 133 Gas Vial.
For the study of pulmonary ventilation and assessment of cerebral blood flow.

DESCRIPTION: The Xenon Xe 133-Ventilation Study System consists of a sealed frangible capsule containing 10 millicuries ± 20% of Xenon Xe 133 gas at calibration time and date with less than 1% carrier xenon in air. Xenon Xe 133 Gas vials is supplied as a carrier-free gas in concentrations of 10 to 50 mCi per milliliter of gas for inhalation. Xenon Xe 133 Gas Ampule is supplied as a carrier-free gas in 4 ml crushable or break-sealed glass ampule in concentrations of 0.43 to 0.33 Curie/ml. Xenon Xe 133 is produced by fission of Uranium-235. It is chemically and physiologically related to elemental xenon, a non-radioactive monoatomic gas which is physiologically inert except for anesthetic properties at high doses.

CONTRAINDICATIONS: None known.

WARNINGS: Xenon Xe 133 should not be administered to children or to patients who are pregnant, or to nursing mothers unless the benefits to be gained outweigh the potential hazards. Ideally, examinations using radio-pharmaceuticals, 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. Adequate reproduction studies have not been performed in animals to determine whether this drug affects fertility in males or females, has teratogenic potential, or has other adverse effects on the fetus. There are no well-controlled studies in pregnant women which allow any conclusions as to the safety of Xenon Xe 133 for the fetus. Xenon Xe 133 should be used in pregnant women only when clearly needed.

Concentrated Xenon Xe 133 gas supplied in ampule must be diluted to the activity range appropriate to the route of administration.

PRECAUTIONS: Xenon Xe 133 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 patients consistent with proper patient management.

Exhaled Xenon Xe 133 should be controlled in a manner that is in compliance with the appropriate regulations of the government agency authorized to license the use of radio-isotopes. Xenon Xe 133 gas delivery systems, i.e., respirators or spirometers, and associated tubing assemblies must be leakproof to avoid loss of radioactivity into the laboratory environment not specifically protected by exhaust systems. Xenon Xe 133 adheres to some plastics and rubber and should not be allowed to stand in tubing or respirator containers for such unrecognized loss of radioactivity from the dose for administration may render the study non-diagnostic.

ADVERSE REACTIONS: Adverse reactions specifically attributable to Xenon Xe 133 have not been reported.

HOW SUPPLIED: Each Ventilation Study System (V.S.S.) contains Xenon Xe 133 in a sealed frangible capsule containing 10 millicuries ± 20% at calibration time and date stated on the label. Each Xenon Xe 133 Gas ampule is supplied in 4 ml crushable or break-sealed ampules containing 1.7 to 1.3 Curies. Each Xenon Xe 133 Gas vial contains 10 or 20 mCi of gas.

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A superior bone scanning agent

Osteoscan-HDP represents a significant technological advance in bone scanning agents. Its unique active ingredient, hydroxymethylene diphosphonate (HDP), provides higher bone uptake than MDP-based agents for clear, definitive scans and excellent lesion detection.

Bone uptake superior to MDP

HDP shows unusually high adsorption to bone. In a clinical comparison, Osteoscan-HDP averaged 21% higher bone uptake than the MDP-based agent.¹

Rapid blood clearance

No bone agent clears the blood faster. Only 6% of Osteoscan-HDP remains in the blood two hours after injection.² Osteoscan-HDP's rapid blood clearance contributes to the overall quality of the image and permits flexibility in scheduling patient scans from 1 to 4 hours post-injection.

References:


Scan data:
The two scans above are of a 56-year-old female patient with breast cancer. Scan: abnormal activity in right ischial ramus. Instrument: General Electric MaxiCamera™ 535; total counts: 2000K; dose: 20.8 mCi; 5'5", 175 lb; dose-to-image time: 2.25 hours
Notice excellent bone delineation in this obese patient.
VP revealed mass in right kidney causing retention.

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

Offering higher bone uptake

Osteoscan-HDP
Technetium Tc99m Oxidronate Kit

Unexcelled image quality

Osteoscan-HDP's high bone uptake and rapid blood clearance permit clear visualization of skeletal detail even in difficult-to-scan elderly patients.

See for yourself

To order Osteoscan-HDP, or for further information, call or write Procter & Gamble, Professional Services, P.O. Box 85507, Cincinnati, Ohio 45201, (513) 977-5547.

High lesion sensitivity

HDP offers a high tumor-to-normal bone ratio. This results in high resolution scans capable of demonstrating subtle skeletal metastases and fractures with no sacrifice in overall image quality.

Scan data:
The two scans above are of a 79-year-old male patient with adenocarcinoma-prostate. Scan: multiple lesions. Instrument: Picker 4/15 Gamma Camera; information density: 3000; dose: 15 mCi; dose-to-image time: 3 hours IVP revealed mass in right kidney causing retention.

Please see the following page for a brief summary of prescribing information.
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 or who are 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 effective 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.

DOSEAGE 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 0.3 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 37000-407-21. The drug can be stored at room temperature both prior to and following reconstitution with ADDITIVE-FREE sodium pertechnetate Tc99m.

For additional product information, call (513) 977-5547 or write: Procter & Gamble. Professional Services. P.O. Box 171. Cincinnati, OH 45201.

November, 1981
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- Provides desired setting of R-wave amplitude discrimination. Ease of lead placement.
- Visual monitoring of ECG and R-wave trigger.
- ONE YEAR WARRANTY

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccuSync-V</td>
<td>R-Trigger pulse output, ECG output, Heart Rate/R-R int., Strip Chart Recorder, Digital CRT Monitor and isolation Amplifier for patient safety.</td>
</tr>
<tr>
<td>AccuSync-I</td>
<td>All AccuSync-V features with the exception of Digital CRT Monitor.</td>
</tr>
<tr>
<td>AccuSync-II</td>
<td>All AccuSync-I features incorporated into a Module designed to fit into certain Mobile cameras.</td>
</tr>
<tr>
<td>AccuSync-III</td>
<td>All AccuSync-I features with the exception of the Strip Chart Recorder.</td>
</tr>
<tr>
<td>AccuSync-IV</td>
<td>All AccuSync-III features with the exception of the Heart Rate/R-R int. display.</td>
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</tbody>
</table>

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(*) not available in the U.S.A.

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  TCK-5-S (size of microspheres from 7 to 25 μ)
- Human serum albumin macroaggregates
  TCK-8 5 multidose vials
  TCK-8-M 10 Monodose vials

For more information, contact us or your local CIS distributor

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Dual detectors double the system sensitivity and the additional counts achieved assure more accurate data and image quality for evaluation.

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Does not accumulate in choroid plexus

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Easy two-step procedure

Kit contains 10 multidose reaction vials.

For further information, call Technical Customer Service, 609-921-4100.

See next page for brief summary.
DESCRIPTION: The kit consists of 10 multidose reaction vials, each containing a sterile, pyrogen-free lyophilized mixture of 10 mg pentetate calcium disodium, 0.50 mg stannous chloride under a nitrogen atmosphere. When sterile, pyrogen-free sodium pertechnetate Tc 99m in isotonic saline is added to the vial, a chelated technetium Tc 99m pentetate is formed. The product as supplied is sterile and pyrogen-free.

INDICATIONS AND USAGE: Technetium Tc 99m pentetate may be used to perform kidney imaging, brain imaging, to assess renal perfusion, and to estimate glomerular filtration rate.

CONTRAINDICATIONS: None known.

WARNINGs: None known.

PRECAUTIONS: Contents of the vial are intended only for use in the preparation of technetium Tc 99m pentetate and are not to be administered directly to the patient except after the addition of sodium pertechnetate Tc 99m. The contents of the kit are not radioactive. However, after the sodium pertechnetate Tc 99m is added, adequate shielding of the final preparation must be maintained. Technetium Tc 99m pentetate 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 and to insure minimum radiation exposure to occupational workers.

To minimize radiation dose to the bladder, the patients should be encouraged to drink fluids and to void immediately before the examination, and for the next 4 to 6 hours thereafter, as often as possible.

Technetium Tc 99m pentetate should be formulated within 6 hours prior to clinical use for brain and kidney imaging, and for assessing renal perfusion. For estimating glomerular filtration rates Tc 99m pentetate should be used within 1 hour after formulation.

The components of the Technetum Tc 99m Pentetate Kit (Chelate) are supplied sterile and non-pyrogenic. Aseptic procedures normally employed in making additions and withdrawals from sterile, non-pyrogenic containers should be used during addition of pertechnetate solution and the withdrawal of doses for patient administration.

The labeling reactions involved in preparing the agent depend on maintaining the tin in the reduced state. Any oxidant present in the sodium pertechnetate Tc 99m supply may thus adversely affect the quality of the prepared agent. Hence, sodium pertechnetate Tc 99m containing oxidants, or other additives, should not be employed without first demonstrating that it is without adverse effect on the properties of the resulting agent.

Carcinogenesis, Mutagenesis, Impairment of Fertility: No long-term animal studies have been performed to evaluate carcinogenic potential or whether technetium Tc 99m pentetate affects fertility in males or females.

Pregnancy Category C: Animal reproductive studies have not been conducted with technetium Tc 99m pentetate. It is also not known whether technetium Tc 99m pentetate can cause fetal harm or affect reproduction capacity when administered to a pregnant woman. Technetium Tc 99m pentetate 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 capacity should be performed during the first few (approx. 10) days following the onset of menses.

Nursing Mothers: Since Tc 99m is excreted in human milk during lactation, formula feedings should be substituted for breast feeding.

Pediatric Use: Safety and effectiveness in children below the age of 18 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: None specifically attributable to the use of technetium Tc 99m pentetate have been reported.

Drug Abuse and Dependence: There is no report of any drug abuse or dependence with this diagnostic agent.

Overdosage: Increased radiation exposure would be expected if an overdosage of the diagnostic agent occurred. For complete prescribing information, consult package insert.

HOW SUPPLIED: Techneplex (Technetium Tc 99m Pentetate Kit) is supplied as a sterile, pyrogen-free kit containing 10 sterile multidose reaction vials and 20 pressure-sensitive labels.
Shielding protection is a necessity. Now, Nuclear Pacific makes it a convenience, as well, with a line of easy-to-use high-visibility vial shields that accommodate most U.S. made vial sizes.

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In addition to protection and visibility, each Nuclear Pacific vial shield offers automatic centering action to position vials and hold them securely. And removable twist lock caps for easy cleaning and needle insertion. To order, or for more information, call Nuclear Pacific, Inc., (206) 763-2170.


### Table: Vials Accommodated

<table>
<thead>
<tr>
<th>Model</th>
<th>Lead Equivalent</th>
<th>HVL for 99mTc</th>
<th>Size of Vial Accommodated</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>3 mm</td>
<td>10</td>
<td>5 thru 30 ml</td>
</tr>
<tr>
<td>77</td>
<td>6 mm</td>
<td>20</td>
<td>5 thru 30 ml</td>
</tr>
<tr>
<td>79</td>
<td>12 mm</td>
<td>40</td>
<td>5 thru 30 ml</td>
</tr>
</tbody>
</table>

**MPI Thallous Chloride TI 201 Injection**

**Thallous Chloride TI 201**

**Diagnostic—For Intravenous Use**

**For Imaging Myocardial Perfusion**

**DESCRIPTION**

MPI Thallous Chloride TI 201. Thallous Chloride TI 201, is supplied in isotonic solution as a sterile, nonpyrogenic radiopharmaceutical for intravenous administration. Each ml contains 1 mCi Thallous Chloride TI 201 at calibration time made isotonic with 5 mg sodium chloride and preserved with 0.5% (v/v) benzyl alcohol. The pH is adjusted to between 4.5-7.0 with hydrochloric acid and/or sodium hydroxide. Thallium TI 201 is cyclotron produced. It is essentially carrier-free and contains no more than 1.0% Thallium TI 200 and no more than 1.0% Thallium TI 202.

**CONTRAINDICATIONS**

None known

**WARNINGS**

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

**Pregnancy Category C**

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

**PRECAUTIONS**

Iodine-131 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 menstrual cycle.

**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 radiopharmaceutical material.

Safety and effectiveness in children have not been established.

**Carcinogenesis**

No long-term animal studies have been performed to evaluate carcinogenic potential. Data are not available concerning the effect on the quality of Thallium TI 201 scans of marked alterations in 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.

**ADVERSE REACTIONS**

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

**NOW SUPPLIED**

MPI Thallous Chloride TI 201, Thallous Chloride TI 201 is available in 2.0 mCi vials.
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MPI Thallous Chloride TI 201 can be delivered with other MPI products without an additional delivery charge.

PLEASE SEE PRECEDING PAGE FOR BRIEF SUMMARY OF PRESCRIBING INFORMATION.
Now there's another innovation in our CRC-30 radioisotope calibrator. Capintec's FUTURE-DOSE adds a new dimension to calibration technology. It lets you supply precalibrated doses for specific injection times. Lets you plan injection schedules a week in advance or calculate dose requirements for seven radioisotopes scheduled up to six months in advance. Naturally, a printed record is made available for all these calculations. With the addition of this new Capintec technology, you have a complete picture of every phase of dose calibration.

What's more, with a CRC-30 calibrator or a CRC-U upgrade you can enjoy the most advanced automated assay capabilities — dose computation, isotope inventory control, radiochemical purity analysis. You'll have complete permanent printed records including 99Mo assay records and injection site records. In addition, you'll be able to meet NRC or state requirements for accountability. Important in keeping your department operating as controls get tighter. Why wait? Now's the time to replace your department's radioisotope dose calibration system (or upgrade your Capintec system) with the best selling, most respected, most capable equipment, from Capintec.
The low-temperature (−20°C) “Cryo/Safe” offers high-volume xenon users an excellent means of decreasing trap effluent concentrations. At −20°C, the xenon adsorption capacity of activated charcoal is about five times greater than at 20°C because xenon atoms remain adsorbed on the charcoal surface for a longer period at lower temperatures. This greatly slows the xenon bolus migration through a charcoal cartridge when carried by a steady air flow. These factors give the xenon more time to decay and thus greatly reduce the xenon concentration in the effluent. In fact, the long-term, steady-state, effluent xenon concentration of this freezer trap is less than 1% of that for a room-temperature trap (assuming a typical use for about 10 patients per week).

For detailed information, see Technical Notes: “Refrigerated Charcoal Trap For Xe-133”, in the Nov./Dec. 1981 issue of Medical Physics.

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Atomic Products ................. 32A
Brattle Instruments ............ IBC
Capintec, Inc. .................. 29A
Clinical Assays .................. 22A
Cyclotron Corporation ............ 40A
EDC/Medical Imaging .......... 38A
Elsint Ltd. ..................... 20A, 21A
Harshaw Chemical .............. 9A
International C.I.S. ........ 13A, 18A
Johnston Laboratories ........... 32A
Medi-Physics, Inc. ............ IFC, 1A, 6A,
                            27A, 28A, BC
Medtronix/M.D.S. ............... 3A
New England Nuclear .......... 4A
Nuclear Associates ............. 31A
Nuclear Pacitic ................. 39A
Nuclear Pharmacy .............. 24A
Nuclear Services .............. 19A
O’Neill Enterprises ............ 12A, 26A
Pharmatopes ................ 8A
Picker International ............. 16A
Procter & Gamble Co. ........ 10A, 11A, 12A
Radx Corporation ............. 17A
Siemens Corporation .......... 14A, 23A
SNM Placement ............... 33A, 34A,
                            35A, 36A, 37A
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These pictures show an example of a patient with occluded carotid artery (University of Texas, Dallas, Department of Radiology).

1. Pre-operative picture
This patient is an 81-year old male who experienced symptoms of dizziness. His right carotid artery was found to be 99% occluded. Prior to an operation to remove the occlusion, his preop study shows an absence of frontal perfusion and a chaotic perfusion pattern in the posterior part of the second slice (6 cm above the OM line).

2. Post-operative picture
After removal of the occlusion, his postop study shows restoration of perfusion to the cortical rim and to the frontal areas of the brain. The perfusion landscape now appears to be nearly normal.

Please see the editorial page 1094-1097 and page 1049-1053, Bonte et al "Single Photon Tomographic Study of Regional Cerebral Blood Flow after Stroke".

Please send me more information on Tomomatic 64

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A New Level of Diagnostic Capability
The Cyclotron Corporation's PCT 4600

A MAJOR ADVANCE IN PCT INSTRUMENTATION
With the advent of The Cyclotron Corporation’s Multi-slice Positron Computed Tomograph (PCT 4600), a new level of diagnostic research capability is now possible. The PCT 4600 system provides high speed, high resolution quantitative images of positron emitting isotopes in the human brain.

QUANTITATIVE ACTIVITY LOCALIZATION
Conventional imaging techniques provide somewhat distorted views of radioactive isotopes because of variations in response and the compression of three dimensions into two. The PCT 4600 system delivers precise quantitative images of excellent quality in transverse sections. Additionally, the positron emitting isotopes used with the PCT 4600 enable the use of more straightforward techniques to evaluate physiological processes.

A POWERFUL RESEARCH TOOL YOU CAN USE TODAY
PCT 4600 systems are currently being built for a number of leading research institutions. Although the specific programs of research to be carried out at these institutions vary in focus, the PCT 4600 system may be used to quantify the concentration of any suitably labeled compound in an area of study. This research capability may be extremely valuable in the measurement of flow, metabolism, and other biological processes in tissue. Research studies using The Cyclotron Corporation’s PCT 4600 should help define the therapeutic efficacy of anticonvulsants in the brain.

NEW RESEARCH POSSIBLE
For the first time it may be possible to map in human subjects the response of specific brain receptors and transmitters to drugs with specified binding characteristics. This type of research may clarify the action of psychotropic agents on conditions such as schizophrenia and Parkinson’s Disease. Studies of the permeability of tissues and research into the physiology of psychoses may now be possible. The PCT 4600 system provides the research tool necessary to view pathological conditions that have been difficult or impossible to obtain through other means. It moves diagnostic research to a new level of capability.

SPECIAL CONFIGURATIONS TO MEET YOUR RESEARCH NEEDS
The PCT 4600 system is one of a family of high performance, research grade instruments designed for maximum effective countrate, optimum sensitivity, and rejection of unwanted background due to scatter and random events.

The signal processing data acquisition systems comprise a parallel ensemble of individual channels maintaining negligible deadtime, even at the highest countrate. A powerful computing system provides rapid image reconstruction plus the capability for efficient parametric analysis of time sequential studies.

The modular design approach employed in this family of tomograph systems allows The Cyclotron Corporation to configure systems to meet many different research applications by optimizing the tradeoffs between sensitivity, resolution and countrate.

A RESPECTED LEADER IN NUCLEAR MEDICINE
The same technical expertise and commitment to developing state-of-the-art equipment that gained The Cyclotron Corporation its leading position in the manufacturing of cyclotrons and neutron therapy systems can be found in the design of the PCT 4600. It is a valuable and powerful diagnostic research tool of unparalleled capability. In addition to the PCT 4600, the Cyclotron Corporation also manufactures a family of whole body, multi-slice PCT systems. Also available is a complete line of compact medical cyclotrons and accessories, including state-of-the-art targetry and processing systems for the production of the short-lived positron emitting isotopes used in positron imaging. We invite the opportunity to discuss your research interests and to configure a complete system to meet those specific requirements.

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