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- Fission product molybdenum 99 is used in the Technetium 99m Generator to provide Sodium Pertechnetate Tc99m activity concentrations sufficient for bolus injections.
- Internal saline reservoir eliminates the need to stock saline vials.
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- Optimum shielding design minimizes radiation to personnel in work areas, providing maximum protection.
- Generator is compact, providing for optimum maneuverability. Generator handle and shipping carton provide for ease in handling and lifting.

TECHNETIUM Tc 99m GENERATOR FOR the Production of Sodium Pertechnetate Tc 99m

**DESCRIPTION:** The Technetium Tc 99m Generator is prepared with fission-produced Molybdenum Mo 99 absorbed on alumina in a lead-shielded column and provides a means for obtaining sterile pyrogen-free solutions of Sodium Pertechnetate Tc 99m in sodium chloride injection. The eluate should be crystal clear. With a pH of 4.5 - 7.5, hydrochloric acid and/or sodium hydroxide may have been used for pH adjustment. Over the life of the generator, an elution will contain a yield of 86% to 100% of the theoretical amount of Technetium Tc 99m available from the Molybdenum Mo 99 on the generator column.

Each eluate of the generator should not contain more than 0.15 microcurie of the Molybdenum Mo 99 per millicurie Technetium Tc 99m per administered dose at the time of administration, and not more than 10 micrograms of aluminum per millicurie of the eluate, both of which must be determined by the user before administration.

**INDICATIONS AND USAGE:** Sodium Pertechnetate Tc 99m is used IN ADULTS as an agent for brain imaging including cerebral radiocolloid angiography; thyroid imaging; salivary gland imaging; placental localization; blood pool imaging including radiocolloid angiography, and urinary bladder imaging (direct isotopic cystography) for detection of vesico-urethral reflux.

Sodium Pertechnetate Tc 99m is used IN CHILDREN as an agent for brain imaging including cerebral radiocolloid angiography, thyroid imaging, blood pool imaging including radiocolloid angiography, and urinary bladder imaging (direct isotopic cystography) for the detection of vesico-urethral reflux.

**CONTRAINDICATIONS:** None known.

**WARNINGS:** Radiation risks associated with the use of Sodium Pertechnetate Tc 99m are greater in children than in adults. In general, the younger the child the greater the risk owing to greater absorbed radiation doses and longer life expectancy. These greater risks should be taken into account in all benefit-risk assessments involving children.

**PRECAUTIONS:** As in the use of any radioactive material, care should be taken to minimize radiation exposure to the patient consistent with proper patient management and to include minimum radiation exposure to occupational workers.

**Carcinogenesis, Mutagenesis, Impairment of Fertility:**

No long-term animal studies have been performed to evaluate carcinogenic potential or whether Technetium Tc 99m may affect fertility in males or females.

**Pregnancy Category:** C

**ADVERSE REACTIONS:** Allergic reactions including anaphylaxis have been reported infrequently following the administration of Sodium Pertechnetate Tc 99m.

**HOW SUPPLIED:** Sodium Pertechnetate Tc 99m is supplied as a Molybdenum Mo 99/Technetium Tc 99m generator in sizes from 32 millicuries up to 18,600 millicuries (in approximately 630 millicurie increments) of Molybdenum Mo 99 at 10:00 P.M. Eastern Time of the day of calibration. The TECHNETIUM Tc 99m GENERATOR consists of:

1) sterile generator, 2) Sodium Chloride injection source, 3) 10 cc sterile evacuated vials, 4) sterile needles, 5) elution vial shields, 6) finished drug labels. Elution vials in 5 cc and 20 cc sizes are available upon request.

**Initial order only**

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

**June, 1983**

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The Standard 10"-12" Mobile Gamma Camera—Obsolescence and Waste.

Until recently, the only way to do bedside nuclear studies was with the so-called “standard” field-of-view (10"-12") mobile camera. For most other studies in the department, a stationary, large field-of-view camera (15"-16") was needed. To do both mobile and stationary studies, two cameras are required. This is wasteful. A solution to this cost ineffective approach is the large field-of-view mobile camera (15¾") Apex 409M, recently introduced by Elscint.

The first gamma cameras were introduced in the 1960’s to an enthusiastic marketplace. Equipped with 10"-12" detectors, they were billed as general purpose for the study of many organs, large and small.

But as often occurs with the introduction of new technologies, their many shortcomings soon became evident. Their 10"-12" field-of-view detectors were either too small or too large for most organ imaging. (The notable exception, then and now, was the adult brain.)

Specialized collimators were soon added: diverging for large organ studies (i.e., lungs, lungs with heart, liver and spleen, etc.); and converging for smaller organs. Even at their best, these techniques forced unwelcome compromises in spatial resolution and distortion.

Large field-of-view cameras with 15"-16" detectors were introduced a decade later, gradually replacing the so-called “standard” cameras. (Actually the term “standard” field-of-view came into use at that time to distinguish between the larger and smaller sized cameras.)

Today, most Nuclear Medicine Departments use a large field-of-view stationary camera as their versatile, general purpose gamma camera, and large field-of-view mobile gamma cameras should be used for the same reasons: They have more applications, provide more and better information, and act as a backup to the stationary camera.

Nuclear Cardiology—Different Problems, Different Solution

The standard field-of-view is not only too small for most organ studies; it is too large for most cardiology studies. A much better size is the 8" detector available only in the Elscint Apex 200 Series of cameras. It is the ideal size for Nuclear Cardiology, not too large, and not too small. Its useful area is 30% larger than the other “cardiology” Anger type mobile camera that has recently been introduced.

Apex 200 Cameras come with a powerful onboard computer for Multigated, First Pass, Thallium and other studies. They are also ideal for Pediatric Nuclear Medicine.

Summary

Whatever the application, a “standard” field-of-view camera is not the answer. For all-purpose Nuclear Medicine, the answer is the Apex 409M (the “standard” is too small); for Nuclear Cardiology or Pediatrics, the answer is the Apex 200 series (the “standard” is too large).

For more information regarding the all-purpose Apex 409M gamma camera from Elscint, please turn the page.

This is an advertisement of Elscint Inc.
The big difference with the Apex 409M is the obvious one, but not the only one. With roughly the same outside dimensions as the “standard” mobile models these cameras offer you much more. Benefits like... 

- A built-in computer system, complete with Winchester disk and 512 acquisition matrix for bedside image acquisition, storage, manipulation, and processing.
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Cameras shown are approximately half-size.
There are times when a product's benefits are pretty obvious and this is one of those times. The product is called the Apex 409M and you can only get it from Elscint.

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In the past, the only way to perform bedside studies of organs larger than the brain was by using diverging collimators with a 250-300mm "standard" field-of-view camera: a method riddled with shortcomings. But now, thanks to today's technology, Elscint has developed a camera so advanced, it offers you both stationary camera performance and mobile camera convenience. No other camera can make this claim.

The Apex 409M from Elscint. The first mobile nuclear camera with a 400mm large field-of-view. It should replace "standard" mobile cameras for good, just as "standard" stationary cameras were replaced years ago by LFOV's.

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SQUIBB™ Diagnostics

Volume 25, Number 11 23A
DESCRIPTION
Macrotec is a sterile, nonpyrogenic, lyophilized preparation of albumin aggregated. Each 5 mL vial of Macrotec contains 1.5 mg of Albumin Aggregated, 0.0 mg Albumin Human, 0.06 mg (minimum) stannous chloride (maximum stannic and stannous chloride 0.16 mg), 1.8 mg of sodium chloride with trace amounts of sodium acetate, acetic acid and hydrochloric acid. Macrotec contains no preservatives. The pH of the reconstituted product is between 3.8 and 8.0.

The aggregated particles are formed by denaturation of Albumin Human in a heating and precipitation process. Each vial contains 1-8 million particles, 90% of which are between 10 and 90 microns in size. The average size is 20 to 40 microns; no particles are greater than 650 microns.

Reconstitution of Macrotec with sterile sodium pertechnetate Tc 99m forms an aqueous suspension of Technetium Tc 99m Albumin Aggregated for diagnostic use by intravenous injection. No less than 90% of the pertechnetate Tc 99m added to the reaction vial is bound to the aggregates at preparation time and remains bound throughout the 5-hour lifetime of the suspension.

INDICATIONS AND USAGE
Lung Imaging
Macrotec (Technetium Tc 99m Albumin Aggregated Injection) is a lung imaging agent which may be used as an adjunct in the evaluation of pulmonary perfusion in adults and children. It is useful for the early detection of pulmonary emboli and in the evaluation of the status of the pulmonary circulation in such conditions as pulmonary neoplasm, pulmonary tuberculosis and emphysema.

Isotopic Venography
Macrotec is also indicated for use in isotopic venography as an adjunct in the screening, diagnosis and management of deep vein thrombosis in the lower extremities.

Combined isotopic venography of the lower extremities and the pulmonary vasculature may be performed.

CONTRAINDICATIONS
Technetium Tc 99m Albumin Aggregated Injection should not be administered to patients with severe pulmonary hypertension.

The use of Technetium Tc 99m Albumin Aggregated Injection is contraindicated in persons with a history of hypersensitivity reactions to products containing human serum albumin.

WARNINGS
The literature contains reports of deaths occurring after the administration of Albumin Aggregated to patients with pre-existing severe pulmonary hypertension. Instances of hemodynamic or idiosyncratic reactions to preparations of Technetium Tc 99m Albumin Aggregated have been reported.

PRECAUTIONS
General
In patients with right to left heart shunts, additional risk may exist due to the rapid entry of Albumin Aggregated into the systemic circulation. The safety of this agent in such patients has not been established.

Hypersensitivity reactions are possible whenever protein-containing materials such as pertechnetate labeled Albumin Aggregated are used in man. Epinephrine, antihistamines and corticosteroids should be kept available for immediate use.

The intravenous administration of any particulate material such as Albumin Aggregated imposes a temporary, small mechanical impediment to blood flow. While this effect is probably physiologically insignificant in most patients, the administration of Albumin Aggregated is possibly hazardous in acute cor pulmonale and other states of severely impaired pulmonary blood flow.

The components of the Macrotec (Technetium Tc 99m Albumin Aggregated Kit) are sterile and non-pyrogenic. It is essential to follow directions carefully and adhere to strict aseptic procedures during preparation.

Contents of the vial are intended only for use in the preparation of Technetium Tc 99m Albumin Aggregated Injection and are NOT to be administered directly to the patient.

The contents of the kit before preparation are not radioactive. However, after the sodium pertechnetate Tc 99m is added, adequate shielding of the final preparation must be maintained.

The technetium Tc 99m labeling reactions involved depend on maintaining the stannous ion in the reduced state. Hence, sodium pertechnetate Tc 99m containing oxidants should not be employed.

The preparation contains no bacteriostatic preservative. Technetium Tc 99m Albumin Aggregated Injection should be stored at 2-8°C and discarded 6 hours after formulation.

Technetium Tc 99m Albumin Aggregated Injection is a physically unstable suspension and consequently the particles settle with time. Failure to agitate the vial adequately before use may result in non-uniform distribution of radioactive particles. If blood is drawn into the syringe, unnecessary delay prior to injection may result in clot formation.

The radiopharmaceuticals shall 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.

As in the use of any other radioactive material, care should be taken to minimize radiation exposure to patients consistent with proper patient management, and to minimize radiation exposure to clinical personnel.

Carcinogenesis, Mutagenesis, Impairment of Fertility
No long-term animal studies have been performed to evaluate teratogenic potential or whether Technetium Tc 99m Albumin Aggregated Injection affects fertility in males or females.

Pregnancy Category C
Animal reproduction and teratogenicity studies have not been conducted with Technetium Tc 99m Albumin Aggregated Injection. It is also not known whether Technetium Tc 99m Albumin Aggregated Injection can cause fetal harm when administered to a pregnant woman or can affect reproductive capacity. There have been no studies in pregnant women. Technetium Tc 99m Albumin Aggregated Injection 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 Tc 99m is excreted in human milk during lactation. Therefore, formula feedings should be substituted for breast feedings.

Pediatric Use
The lowest possible number of particles should be used in the right-to-left shunting, in neonates and in severe pulmonary disease.

ADVERSE REACTIONS
Although adverse reactions specifically attributable to the Technetium Tc 99m Albumin Aggregated Injection have not been noted, the literature contains reports of deaths occurring after the administration of Albumin Aggregated to patients with pre-existing severe pulmonary hypertension. Instances of hemodynamic or idiosyncratic reactions to preparations of Technetium Tc 99m Albumin Aggregated have been reported.

HOW SUPPLIED
Macrotec (Technetium Tc 99m Albumin Aggregated) is supplied as a kit containing 10 reaction vials (5 mL size).
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This easy-to-use manual explains the indications and expected findings of nuclear medicine studies, compares them to other diagnostic modalities, and helps referring clinicians select the most appropriate studies. Unnecessary tests are reduced and the patient’s stay can be shortened. In addition, the Clinician’s Guide contains information useful to the nursing staff in preparing and managing patients before and after their nuclear medicine studies. Ask your representative how you can obtain copies of the Clinician’s Guide for your hospital. And ask about our other programs to keep the phone ringing in your department. Our goal is Imaging Excellence: enhancing the image of your department while improving the images in your department.

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Center for Molecular Medicine & Immunology
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SEE ALASKA
Fairbanks Memorial Hospital is now recruiting for Technologists in the Imaging Department. Applicants should be registered in nuclear medicine and/or ultrasound. Experience or a desire to learn CT is also helpful.

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Interested parties, contact the Personnel Department, Fairbanks Memorial Hospital, 1650 Cowles Street, Fairbanks, Alaska 99701 or call (907) 452-8181, ext. 496.
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