

**Nuclear Medicine Capital Equipment Specifications**  
**Non-Diagnostic SPECT/CT – Puget Sound Health Care System– 663-B32022**

Puget Sound Health Care System is requesting a diagnostic SPECT/CT. This equipment will be used to provide diagnostic quality CT images for soft tissue which includes – Octreoscans, Parathyroid scans, MIBG scans, I-131/I-123 scans, Liver scans with labeled red blood cells, infection imaging with labeled white blood cell scans, bone imaging in obese patients, and other miscellaneous SPECT/CT uses.

**Main Nuclear Medicine System**

1. Dual Detector with Variable Angle
2. Large Field of View: minimum UFOV 50cm x 38cm
3. Table Weight Limit > 500lbs
4. Energy Range Minimum 60-550keV
5. CTAC Timing Resolution equal to or less than 0.5 Sec, multiple kVp, mA
6. Iterative Reconstruction for CTAC
7. Hi Resolution Detector – 3/8” Crystal
8. High Performance Dual Head Configuration
9. Our room size is limited therefore, please provide dimensions of the system H x D x W (in), as this will be important evaluation information.

**CT Specifications**

1. Separately functioning gantry system for CT scanner
2. Number of simultaneously acquired CT slices - minimum 2
3. Field of View: minimum 50cm
4. Rotation time: minimum 0.9 seconds
5. mA equal to or greater than 300 with dose modulation

**Collimators**

1. Low Energy High Resolution (LEHR) Collimators (x2) – to be used for General All Purposes Images
2. Medium Energy General Purpose Collimators (x2) – to be used for Octreo Scan, Indium imaging
3. High Energy General Purpose Collimators (x2)– to be used for I-131 imaging
4. Pinhole Collimators (x2) – minimum aperture 4mm
5. Collimator Cart(s) – as required by vendor

**Accessories/Additional Items:**

1. ECG/Cardiac Gate
2. Flood Source/Holder
3. Four Quadrant Bar Phantom
4. Point Source/COR Source/Holder
5. Low Contrast CT Phantom/Holder
6. Scanner UPS
7. Main Disconnect Panel
8. Head Holder

9. Patient Arm Support
10. Patient Leg Rest
11. Patient Pallet Extender
12. Patient Table Multi-angle Pivot – to perform stand up images
13. CT Contrast Injector
14. Seismic anchoring
15. Head holder for close range brain imaging

**Acquisition Workstation – located in the control room**

1. Acquisition/Console Hardware
2. Minimum 19" LCD Monitor (quantity as required by vendor)
3. Keyboard/Mouse
4. Workstation UPS (as defined by vendors)
5. Hardware memory upgrade (ex: 24GB RAM)

**Processing Workstation – located in the control room – to mimic reading workstation configuration**

1. Acquisition/Console Hardware
2. Minimum 19" LCD Monitor (quantity as required by vendor)
3. Keyboard/Mouse
4. Workstation UPS (as defined by vendors)
5. Hardware memory upgrade (ex: 24GB RAM)

**Reading Workstations – (quantity 2 – one in nuclear medicine reading room and one in an office)**

1. Hardware
2. Diagnostic Color Dual Monitor - Minimum 19" LCD Monitor (quantity as required by vendor)
3. Keyboard/Mouse
4. Workstation UPS (as defined by vendors)
5. Supplemental In-room SPECT Acquisition Control
6. Professional Interpretation Workstation Hardware
7. Hardware memory upgrade (ex: 24GB RAM)

**Software**

1. Acquisition Software
2. DICOM 3.0 Compatible Worklist
3. SPECT/CT Processing
4. Nuclear Medicine Diagnostic Applications Brain, Cardiac, Renal, Oncology, Organ Processing
5. SPECT/CT Fusion Applications
6. 3D Reconstruction Applications
7. CT dose reduction / management
8. Software Licenses

**Advanced Applications (all applications to be included on the all processing and reading workstations)**

1. Whole Body SPECT Capability

2. Advanced Nuclear Cardiology SPECT/CT
3. Advanced Nuclear Cardiology Configuration/Hardware/Processing including cardiac gating
4. SPECT/CT MPI Registration/QC Package (ex: Cedars QGS/QPS, Emory TB, 4DM)
5. Advanced Nuclear Oncology
6. Advanced Nuclear Neurology
7. Advanced Iterative Reconstruction/Processing for Nuclear Medicine/Nuclear Cardiology
8. Advanced Resolution Recovery
9. Advanced Bone Imaging
10. ½ time/dose Planar
11. ½ time/dose SPECT

### **Training**

1. Initial Onsite Applications Training (1 week) – to be used 1 week prior to Go-Live for Technicians
2. Go-Live onsite Applications Training (1 week) – to be used for technicians
3. Go-Live onsite Applications Training (1 week) – to be used for Physicians
4. Follow-up Onsite Applications Training (1 week) – to be used with the first 9 months from Go-Live for Technicians
5. Follow-up Onsite Applications Training (1 week) – to be used with the first 9 months from Go-Live for Physicians
6. Offsite Training for Technicians
7. Offsite Training Travel Package (Lodging/Meals/Transportation)
8. Technical Biomedical Engineering Training
9. Technical Biomedical Engineering Training Travel Package (Lodging/Meals/Transportation)

### **Support and other Documentation to Provide:**

1. Provide DICOM Conformance Statement
2. Provide completed Pre-procurement Assessment form (6550) and MDS2 document
3. Provide information about your companies support structure during the warranty period (i.e. a listing of Field Service Engineer locations and availability, support 800 phone number(s), remote support, etc.)

### **Trade-in**

Option 1

Manufacture: Philips

Model: Forte Jetstream

Installed: July 2006

EE#: 64361

Serial Number: FA06020229

Qty	Item Description
1	<p><b>Symbia Intevo 2</b></p> <p>The Symbia Intevo 2 is built on xSPECT technology, enabling true integration of SPECT and CT. With xSPECT technology the SPECT information is registered into the CT frame of reference laying the foundation for higher SPECT image resolution and accurate and reproducible quantitative results. The Symbia Intevo 2 has state-of-the-art SPECT and high quality two slice diagnostic CT, providing this system full functionality for all SPECT, xSPECT, and stand-alone CT diagnostic applications in Cardiology, Oncology, Neurology, and General Nuclear Medicine.</p>
2	<p><b>Low Profile 3/8" Detectors</b></p> <p>The low profile high resolution, digital detector assembly includes a .95 cm (3/8 in.) thick NaI (TI) crystal.</p>
1	<p><b>Symbia Intevo Caudal Tilt</b></p> <p>Caudal tilt on Detector 2 allows for precise positioning of static and dynamic acquisitions.</p>
2	<p><b>Low_Energy_Hi_Res Collimator Symbia</b></p> <p>Low energy (140 keV), high resolution, parallel hole collimator</p>
2	<p><b>Medium Energy Collimator Symbia</b></p> <p>Medium energy (300 keV), parallel hole collimator</p>
2	<p><b>High Energy Collimator Symbia.</b></p> <p>High energy (364 keV) parallel hole collimator</p>
1	<p><b>Pinhole Collimator Symbia</b></p> <p>Pinhole collimator with a 4mm aperture</p>
1	<p><b>Symbia Intevo Productivity Package</b></p> <p>The productivity package automates collimator exchange and quality control to improve the productivity of the Symbia Intevo camera systems.</p>
1	<p><b>AQC Web Based Training</b></p> <p>AutoQC web based training is available on the Siemens training website.</p>
1	<p><b>AutoQC Source Registration Kit</b></p> <p>Source registration kit for Symbia Automatic Quality Control option. This kit contains information on updating site radioactive materials license, contact information for source vendor, and user instructions.</p>

Qty	Item Description
1	<p><b>AutoQC source kit</b></p> <p>This source kit contains includes 1 - Gd-153 line and 1 - Co-57 point source required for the automatic quality control option.</p>
1	<p><b>Symbia Collimator Cart</b></p> <p>The collimator cart is designed to hold extra collimators and allows collimator exchange without removing the bed.</p>
1	<p><b>Dedicated Reconstruction System</b></p> <p>The syngo-based high performance workstation utilizes a 64-bit architecture to perform advanced SPECT reconstructions in clinically useful time frames. In addition, the workplace offers customizable displays and full DICOM archiving and printing functionality. Hardware: - Two Six-Core 2.9 GHz Xeon CPU - 64 GB RAM - NVidia Q600 Graphics Card - Integrated DVD-R RW - HP Liquid Cooling System - Workflow-based Architecture</p>
1	<p><b>Monitor: 19 inch LCD</b></p> <p>The 19" LCD Monitor is an economic monitor solution</p>
1	<p><b>Internal ECG for Symbia</b></p> <p>The internal ECG gating system provides ECG triggering for the nuclear subsystem for nuclear cardiology examinations. In addition, for Symbia T2, T6, and T16 cameras, the internal ECG gate provides ECG triggering to the CT subsystem for CT applications that require ECG gating. The ECG gate is built into the Symbia patient bed and is controlled by the Symbia acquisition workplace. The leads connect near the head of the patient bed and travel with patient, thus never interfering with scanning. The ECG waveform is displayed on the touch-screen Patient Positioning Monitor.</p>
1	<p><b>Under Floor PHS Cable</b></p> <p>Kit for routing the cable between patient bed and the Symbia T Series gantry under the floor.</p>
1	<p><b>PHS Extended Pivot</b></p> <p>The PHS extended pivot option extends the range of pivot for the patient bed in gurney mode.</p>
1	<p><b>Organ Processing for Symbia</b></p> <p>This upgrade will add organ processing capabilities to your acquisition workplace.</p>
1	<p><b>Remote Diagnostic Services</b></p> <p>Remote Diagnostic Services. A broadband connection is required for full remote diagnostic functionality and optimal system uptime.</p>
1	<p><b>Seismic Kit</b></p> <p>The Symbia seismic kit anchors the Symbia gantry and bed in compliance with local earthquake requirements.</p>
1	<p><b>Symbia T Series US Installation</b></p> <p>This option includes the mechanical installation of the Symbia T Series camera system.</p>
1	<p><b>Symbia.net</b></p> <p>Symbia.net is an economical solution for reading of SPECT and SPECT•CT studies. The system can be optionally configured with full MI processing capabilities. The Symbia.net can be configured as a client-server system by adding the Server Management option. PET functionality is available on multi-seat systems.</p>
1	<p><b>Monitor, 19" LCD DICOM</b></p> <p>The 19" DICOM Calibrated LCD monitor is designed to meet the demanding requirements of medical imaging. The display features high contrast even under high ambient light conditions that can be encountered in nuclear medicine viewing environments. The gamma curve is exactly matched to CIE/DICOM recommendation, enhancing the ability to display both color and gray scale images. Light output stability is ensured by continuous backlight control throughout the display's lifetime.</p>

Qty	Item Description
1	<p><b>Server Management</b></p> <p>This option will upgrade a stand-alone Symbia.net workplace to a client server solution that scales up to 5 concurrent users.</p>
1	<p><b>Symbia.net Client</b></p> <p>The Symbia.net Client adds an additional concurrent user to the Symbia.net Server Management clinical workflow servers.</p>
1	<p><b>Oncology Engine</b></p> <p>The Oncology Engine facilitates lesion detection by enabling the visualization, volumetric analysis, and fusion of SPECT studies as well registration of images from other, independently acquired modalities (e.g., CT, MR).</p>
1	<p><b>+ Oncology Engine</b></p> <p>Enables the Oncology Engine functionality for a single concurrent user.</p>
1	<p><b>Cardiology Engine Cedars</b></p> <p>The Cardiology Engine Cedars assists in the diagnosis and quantitative assessment of coronary artery disease by enabling the visualization of SPECT studies as well as quantified perfusion assessment.</p>
1	<p><b>+ Cardiology Engine Cedars</b></p> <p>Enables the Cardiology Engine Cedars functionality for a single concurrent user.</p>
1	<p><b>Organ Processing</b></p> <p>Processing software package that provides cardiac and other organ-based SPECT processing.</p>
1	<p><b>+ Organ Processing</b></p> <p>Enables the Organ Processing functionality for a single concurrent user.</p>
1	<p><b>Reconstruction Engine</b></p> <p>The Reconstruction Engine provides the ability to shorten SPECT and Planar acquisition times with optimized workflows based on Siemens' innovative Flash reconstruction techniques. This engine is suited to provide the best reconstruction for SPECT-only scanners.</p>
1	<p><b>+ Reconstruction Engine</b></p> <p>Enables the Reconstruction Engine for a single concurrent user.</p>
1	<p><b>English Symbia.net Lang Kit</b></p>
1	<p><b>English Symbia.net Lang Kit</b></p>
1	<p><b>English Cedars Lang Kit</b></p>
1	<p><b>English Cedars Lang Kit</b></p>
1	<p><b>4Quadrant Phantom for SymbiaS/T/Intevo</b></p> <p>A 4 quadrant 2.0-2.5.30.3.5 mm standard pattern slightly modified for use with the e.cam and Symbia Imaging Systems</p>
1	<p><b>UPS for SPECT Camera Systems</b></p> <p>Uninterruptible power supply option that provides 10 minutes of back up power to the SPECT gantry enabling the proper shut down in the event of a power loss. Also provides noise filtering and transient suppression. Specifications:5.0 KVA Input configuration: 200-240 VAC, 50/60 Hz, L6-30P Output configuration: 208 VAC, L6-30R</p>
1	<p><b>UPS for e.soft/c.cam (60 Hz)</b></p> <p>Uninterruptible power supply option that provides 10 minutes of back up power enabling the proper shut down of the system in the event of a power loss.</p>

Qty	Item Description
1	<p><b>Initial onsite training 32 hrs</b></p> <p>Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>MI_SYMB_FOLLOWUP</b></p> <p>Up to (32) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>CT Cross Trainer (Printed Self Study)</b></p> <p>CT Cross Trainer printed self study materials for (1) imaging professional. These materials will provide the user with basic CT knowledge by testing the participant periodically. Successful completion of the self study program will provide the participant with CE credits. CT Cross Trainer printed self study materials for (1) imaging professional. These materials will provide the user with basic CT knowledge by testing the participant periodically. Successful completion of the self study program will provide the participant with CE credits. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>MI SPECT Project Management</b></p> <p>A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen's equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.</p>
1	<p><b>Additional onsite training 24 hours</b></p> <p>Up to (24) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from date of purchase order. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p><b>Initial onsite training 32 hrs Gov Offse</b></p>
1	<p><b>Low Contrast CT Phantom &amp; Holder</b></p>

One complimentary biomedical tuition is included with the purchase of this system. This training must be completed before the end of the warranty period.

Offset Part 10520785 English Symbia.net Lang Kit                      x 2 =

Offset Part 10182968 English Cedars Lana Kit                      x 2 =

Qty	Item Description
1	<p><b>Neurology Engine</b> The Neurology Engine enables the quantification of SPECT neurology examinations.</p>
1	<p><b>+ Neurology Engine</b> Enables the Neurology Engine functionality for a single concurrent user.</p>
1	<p><b>English Scenium Lang Kit #SM</b></p>
1	<p><b>English Scenium Lang Kit #SM</b></p>
1	<p><b>xSPECT Quant Tc99m</b> Advanced SPECT reconstruction technique that allows accurate and reproducible quantitative Tc99m SPECT imaging.</p>
1	<p><b>xSPECT Bone</b> Advanced Bone Imaging Technique that enables higher image resolution than conventional SPECT or SPECT/CT bone image reconstructions.</p>
1	<p><b>xSPECT Quant Calibration Source</b> This source kit contains includes a precision Co-57 point source required for calibrating the xSPECT Quant Tc99m option.</p>
1	<p><b>xSPECT Quant Source Registration</b> Source registration kit for Symbia Intevo Quantitative Tc99m option. This kit contains information on updating site radioactive materials license, contact information for source vendor, and user instructions.</p>

## **Description**

The Symbia Intevo 2 camera system consists of the following integrated features:

- Gantry
- Patient Bed
- Acquisition Workplace
- SPECT Acquisition Features
- CT Acquisition Features

### **Gantry**

Variable Angle, open design with 70 cm (27.6 in.) patient opening. The two new low profile digital SPECT detectors can be configured at 76° or 90° for cardiac applications and at 180° for all other whole body and general protocols. Optional caudal tilt of one detector allows for optimum detector positioning of static and dynamic acquisitions. The Ultra Fast Ceramic multislice spiral CT detector rotates at 75 RPM (0.8 sec per revolution). The unobstructed gantry base permits planar imaging of seated and standing patients and patients on wheelchairs, or on standard imaging tables, gurneys and hospital beds.

The gantry supports circular and non-circular orbits. Autocontour, with infrared real-time body contouring, is a standard component which minimizes patient to collimator distance to 1.2 cm (0.45 in.) in Whole Body and SPECT non-circular orbit acquisition modes.

All motorized motions of the system are controlled from hand controller which can be plugged into either side of the gantry.

The Patient Positioning Monitor is a touch screen flat panel which can be rotated for a wide range of user access and visibility. It is used for the following functions:

- Patient positioning with window and persistence adjustment
- Acquisition parameter display (elapsed time, time remaining, view number, count rate, etc.)
- Camera information (detector and bed positions)
- Gantry control (reconfiguration, collimator change, offset zoom, and adjusting the CT acquisition limits.)

A fully integrated source holder is provided for quick and convenient quality control.

### **Patient Bed**

The patient-oriented design of the imaging bed consists of 35.6 cm (14 in.) wide and 15 mm (0.6 in.) thin, carbon fiber pallet, supporting patient weights up to 227 kg (500 lbs). Minimum bed height is 53 cm (21 in.) for easy patient access. Programmable table positions for wheelchairs and gurneys minimize the transport efforts of patients and staff. Integrated rulers on each side of the patient bed allow for quick whole body set up. The bed also provides automatic, uninterrupted table feed for multi-rotation continuous CT volume scanning. The patient bed can be easily pivoted to the side for rail-free access of sitting/standing patients, wheelchairs, imaging tables, gurneys and hospital beds.

### **Acquisition Workplace**

The syngo-based high performance workstation provides a multi-modality graphical user interface, keyboard and mouse. SPECT and CT acquisition, quality control, and display are integrated in a single workplace. Workflows for a wide variety of clinical protocols are included. The workplace offers customizable displays and full DICOM archiving and printing functionality.

## Description

### Hardware:

- Single Quad-Core 2.54 GHz Xeon CPU
- 4 GB RAM
- 4 X 300 GB SAS Hard Drives
- Integrated DVD-R RW
- Workflow-based Architecture

### SPECT Acquisition Features

#### SPECT Acquisition Modes

- Planar static and dynamic
- Whole Body
- SPECT
- Gated SPECT
- Dynamic SPECT
- Whole Body SPECT

#### SPECT Features

##### Workflow Features:

The system combines acquisition, post-processing (optional), and display into user customizable workflows that automate many of your clinical routines. Besides remembering and storing your parameters for each clinical protocol, the workflow will automatically print, archive, and distribute your results to other devices on your network.

##### Quality Control:

Use the automatic and manual motion correction features of the system to aid you in the quality of your acquired images. Besides correcting for motion, you can beat normalize your gated studies and create quality control images such as sinograms and linograms to document your results.

##### 3D Orientation:

Reorient your acquired SPECT volumes interactively to achieve the desired patient position. Cardiac and general orientations are supported. If desired, the orientation applied to one volume can be automatically applied to up to 3 additional volumes.

##### Image Registration:

Multiple techniques are available for accurate registration of your acquired images. Translations and rotations in all 3 planes provide a foundation for accurate registration. The optional automatic registration technique can often assist you in those hard-to-register cases. A landmark registration feature rounds out the available techniques. Triple registration and the choice of output matrix size are also standard features.

##### Reconstruction:

The reconstruction engine supports up to 5 multi-isotope studies concurrently. Standard SPECT as well as wholebody, dynamic and gated cardiac volumes can be created. Advanced techniques that provide high image quality come standard with our system:

- xSPECT Iterative Reconstruction
- The xSPECT ordered-subset conjugate-gradient reconstruction algorithm uses xSPECT technology to register the SPECT information into the CT frame of reference laying the foundation for higher SPECT image resolution with xSPECT Bone and accurate and reproducible quantitative results with xSPECT Quant Tc99m.
- Flash Iterative Reconstruction  
OSEM reconstruction algorithm using 3D collimator modeling to increase resolution and decrease noise, while maintaining the exact shape of organs and lesions, when compared to filtered back projection reconstruction.
- CT Attenuation Correction

## Description

Creates very precise attenuation maps from the high quality CT data to correct for attenuation and increase reading accuracy.

- Scatter Correction

Uses patient specific scatter projection estimates from a generalized dual-or triple energy window method to compensate for scatter during the iterative reconstruction process.

## CT Acquisition Features

### CT Acquisition Modes

- Topogram, scanning perspectives: anterior-posterior (ap), posterior-anterior (pa), lateral (lat)
- Spiral CT, continuous volume scanning technique with uninterrupted table feed in the multi-rotation mode
- Sequential CT, incremental, slice-by-slice imaging mode with no table movement during data acquisition

### CT Features

#### **CARE Dose 4D:**

This software feature provides automatic, real-time x-ray dose management for all scan modes. The minimal x-ray dose level needed to obtain optimal image quality is determined from extensive computer analysis of the Topogram image and also from the data collected during every slice scanned, on a real time basis. This dual stage automatic approach ensures optimal image quality at the lowest possible x-ray dose.

With this method of dose control, the initial or starting tube current for every axial slice position is determined from the Topogram image. Then, during the data acquisition for each axial slice, the x-ray attenuation values are closely monitored and the tube current is adjusted, on a real time basis, to optimize the x-ray dose level for the specific organs and anatomy in the x-ray path.

Several clinical benefits are achieved with CARE Dose 4D:

- Significant x-ray dose reduction (up to 68 %) possible for all body regions scanned compared with standard sequence or spiral scanning
- Consistent, optimal image quality with the x-ray dose level unique for every patient and for every anatomical region
- Thinner axial slices and/or longer scan ranges possible because of reduced tube loading
- Ultra-low dose examinations for pediatric patients

#### **SureView™ – Multislice Image Reconstruction System**

- Excellent Image Quality and no slice broadening at any pitch – IQ is kept constant for all scan speeds, independent of the selected range and scan time.
- Up to 20% dose savings in spiral mode.

#### **Workstream4D**

4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols. Elimination of manual reconstruction steps. Reduction of data volume up to a factor of 10, since virtually all diagnostic information is captured in 3D slices. Fast image reconstruction of up to 16 images/s in 512 matrix is provided.

#### **Asynchronous Recon:**

Asynchronous Recon allows for multiple image reconstructions and reformats, parallel to scanning. With this feature, up to eight reconstruction job requests can be loaded into a scan protocol. Immediately upon completion of the scan acquisition, these reconstruction jobs are automatically executed in the background without delaying the start of next patient examination.

#### **Image reconstruction:**

Reconstruction using raw data zoom with the possibility of freely selecting the image center either before scanning (prospectively) or retrospectively.

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## Description

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**Image display:**

CT value scale for window setting -1024 to +3071 HU. For very dense objects the CT value scale can be extended from -10240 to +30710 HU.

**Multiplanar Reconstruction (MPR)**

Real-time MPR for real-time reconstruction of secondary slices.

Slice orientation: coronal, sagittal, irregular as well as multi-planar with SIR and Oblique. Cutlines can be determined using the reference tomogram or in sagittal reformatted images (SRI). 512 x 512 reconstruction matrix.

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Symbia Intevo utilizes energy independent low profile high definition digital detectors.

Detector assembly technical specifications:

- True rectangular FOV of 38.7 x 53.3 cm (15.25 x 21 in.)
- 59 photomultiplier tubes – 53, 7.6 cm (3 in.) and 6, 5.1 cm (2 in.) diameter tubes
- .95 x 59.1 x 44.5 cm (3/8 x 23 x 17.4 in.) NaI (TI) crystal material

The Low Profile HD Detector features:

- Balanced performance between energy resolution and spatial resolution
  - One, 10-bit high-speed flash ADC per PMT
  - Variable PMT selection ensures high resolution for all multi-energy and multi-peak applications
  - Optimized dynamic digital integration time to improve high count rate capability
  - Individual PMT pile-up correction for improved performance at high count rates
  - Energy independence maintains clinical performance at all energies including multi-peak and dual isotope studies
  - Location independence maintains consistent spatial resolution across the field of view
  - Crystal variation correction for optimal uniformity and linearity across all energies
  - Single source (Co-57 or Tc-99m) tunes the detector for all energies
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The low energy high resolution collimator has the following technical specifications:

- 148,000 hexagonal holes
  - Sensitivity: 202 cpm/microCurie
  - Resolution: 7.5mm at 10 cm
  - Weight: 22 kg (49 lbs)
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The medium energy collimator has the following technical specifications:

- 14,000 hexagonal holes
  - Sensitivity: 275 cpm/microCurie
  - Resolution: 12.5 mm at 10 cm
  - Weight: 64 kg (140 lbs)
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The high energy collimator has the following technical specifications:

- 8,000 hexagonal holes
- Sensitivity: 135 cpm/microCurie
- Resolution: 13.4 mm at 10 cm
- Weight: 125 kg (275 lbs)

Due to the weight of these collimators, it is recommended that an individual collimator cart containing only the 2 high energy collimators be utilized.

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The pinhole collimator with 4 mm aperture has the following technical specifications:

- 1 round hole

<b>Description</b>
<ul style="list-style-type: none"> <li>- Sensitivity: 123 cpm/microCurie for 99m Tc</li> <li>- Resolution: 6.6 mm at 10 cm</li> <li>- Weight: 80 kg (177 lbs)</li> </ul> <p>SPECT imaging with a pinhole collimator is not allowed.</p> <p>The pinhole collimator occupies the upper 2 locations on a collimator cart; Therefore, only an additional 2 collimators (1 pair) can be stored on the same cart.</p>
<p>The productivity package includes the following features:</p> <ul style="list-style-type: none"> <li>- Integrated Collimator Changer</li> <li>- Automatic Collimator Exchange</li> <li>- Automatic Quality Control</li> </ul> <p><b>Integrated Collimator Changer</b></p> <p>Innovative collimator exchange system that is mounted beneath the patient bed. Saves time and effort when changing the most frequently used collimators. Holds two sets of low or medium energy collimators including SMARTZOOM collimators.</p> <p><b>Automatic Collimator Changer</b></p> <p>Fully automated changing of collimators within the integrated collimator changer. Collimator removal or exchange is initiated from the patient positioning monitor.</p> <p><b>Automatic Quality Control</b></p> <p>Automatic quality control is performed via self-shielding Gd-153 line and Co-57 point sources. The sources are housed in the patient bed and are extended automatically as part of the camera's quality control procedures. The daily, weekly, and monthly procedures are customer scheduled and performed automatically without manual intervention.</p>
<p>The useful life of the 370 MBq (10 mCi) Gd-153 line, used for daily extrinsic floods and monthly multi-head registration procedures, is 2 years. The useful life of the 1.85 MBq (50 µCi) Co-57 point, used for intrinsic floods, is 1 year.</p> <p>Sources that have been replaced are returned to the source vendor for disposal. Return shipment costs are not included in the purchase price.</p>
<p>The collimator cart is automatically clamped to the patient bed once positioned by the user. The clamping mechanism allows precise collimator exchange to occur.</p> <p>The collimator cart is designed to hold 2 sets of collimators, or 1 set in combination with a pinhole collimator.</p> <p>Due to the weight of the high energy collimators, it is recommended that an individual collimator cart containing only the 2 high energy collimators be utilized.</p>
<p>The Monitor: 19 in. LCD technical features are:</p> <ul style="list-style-type: none"> <li>- 19" active display</li> <li>- Optimal picture resolution of 1280 x 1024</li> <li>- Anti-glare panel surface</li> <li>- Up to 170 degree viewing angle</li> </ul>
<p>The extended pivot opens the range from 40 degrees to 45 degrees to allow better handling of wide hospital beds.</p>
<p>Organ processing provides generic tools for the manipulation of NM images. In addition, it provides dedicated</p>

## Description

provided are:

- Cardiac: Planar Gated Blood Pool, First Pass, Shunt
- Lung: Perfusion, Ventilation, V/Q
- Thyroid
- Renal: GFR, ERPF, MAG3, Transplant, TER, Ace Inhibitor
- Gastric
- Hepatobiliary
- Brain: Patlok, Lassen, IMP, IMP-ARG, NIMS
- GSA Liver
- Parathyroid: Scaled subtraction
- Image manipulation tools: Series Filter, Series Arithmetic, Series Reformat, and Series ROI and Curve

A broadband connection is required for full remote diagnostic functionality and optimal system uptime. The Remote Diagnostic Services option allows for remote access to your networked workstations. This service includes all the necessary hardware, software and configuration required to access your equipment remotely for the purposes of remote diagnostics. Features include:

- Image Transfer
- Access to automatic Virus Protection updates
- Error log retrieval
- Remote Workflow revisions
- Remote configuration
- License management
- Remote workstation control via netmeeting

The kit anchors the gantry and bed to the floor with the included bed tie down assembly and seismic anchor bolts for the gantry.

Installation includes:

- Complete system assembly
- Alignment
- System startup
- Calibrations
- Performance verification to factory specifications

This option is required for all US Installations

Symbia.net is a clinical workplace that offers:

System Features:

- Workflow based architecture
- DICOM networking, printing
- User configurable displays
- 3D Orientation
- Image Fusion

Server Hardware

- Microsoft Windows XP SP3
- Dual Xeon multi-core CPUs
- 12 GB Memory
- Dual Monitor option

## Description

- Any standard PC, Mac, or iPad with a network connection can be set up as a client
- Up to five concurrent users can access the clinical network simultaneously

### Easy installation and operation

- Symbia.net easily integrates with existing cameras, RIS and PACS
- A virtually unlimited number of client computers can be installed remotely (requires Server Management option)
- Designed for the needs of nuclear medicine with a user friendly interface and advanced automation features

### Optional Extensions

- Server Management option
  - Supports up to 5 concurrent users
  - 1 seat at the workplace
  - Up to 4 floating client licenses
- Cardiology Engines
- Oncology Engines
- Neurology Engines
- MI Processing Engine
- Advanced SPECT/CT Reconstruction
- MI Cardiac Process Engine

### Additional features include:

- 19" TFT panel
- minimum of 170 degree horizontal and vertical viewing angle
- Optimal picture resolution of 1280 x 1024
- Contrast ratio 450:1
- Maximum luminance 280 cd/m<sup>2</sup>
- Anti-glare panel surface

A Symbia.net Client allows for anytime, anywhere execution of MI workflows provided by the Symbia.net servers

### Recommended Hardware Configuration for Client Machines:

- 1.0 GHz CPU
- 1 GB memory
- Minimum graphics resolution of 1024 x 768
- Dual Monitor support for Windows Client. Single monitor support for Mac Clients
- OS: Windows XP SP3, Windows Vista Home Premium, Windows Vista Business, MacOS X 10.5 or Higher, Windows 7 Professional, iPad
- Network connection (wired or wireless)
- Minimum network bandwidth – 100Mbps wired, 54Mbps wireless
- Internet browser installed

Oncologic diagnosis demands a volumetric visualization technique that provides fused anatomical and functional volumes into orthogonal planes using multiple layout views or full screen mode. This engine provides tools to evaluate and display SPECT (and independently acquired CT) images and results, enabling customized user defined formats, image reorientation in any axis, an array of color look-up tables, and filming options. Standard features include: viewing of SPECT and CT DICOM images including image fusion display for registered series; common display tools such as correlated cursors, quantitative color bar and interactive pixel value; default CT image windows; display of CT Maximum Intensity Projections (MIP); 3D Reorientation of volume data; region of interest (ROI) and volume of interest analysis and visualization.

## Description

The Cardiology Engine provides the Cedars Cardiac SPECT Suite, a comprehensive set of quantitation programs for the evaluation of SPECT Myocardial Perfusion Imaging

The engine calculates a comprehensive set of cardiac parameters including ejection fractions, volumes, wall motion including right ventricular free wall motion in QBS, wall thickening, perfusion (%). QPS allows for the quantitation of prone SPECT data and of serial perfusion changes. Both 20 and AHA-17 segment scoring models are available. In addition to calculating an Eccentricity Index, QGS also calculates a more regional measure of LV shape known as the Shape Index. Displays include gated slices with contours, a motion frozen display which results in better resolution and contrast by eliminating motion of the cardiac cycle, interactive 3D images, and polar maps. Manual over-ride of contours and DICOM compatible output are additional features. Outputs include DICOM secondary capture files, result files as well as the ability to generate an AVI file format. The Cedars application is an OEM product developed and supported by Cedars Sinai.

Applications include: Cedars SPECT Suite

### Cardiac Processing (Autocardiac Activity) Features

- Process up to 4 series simultaneously
- Mixed Non-Gated, Gated, Profile series simultaneously Profile simultaneous AC and Non-AC Multi-Isotope support (6 per series)
- Separate reconstruction parameters per series / isotope 3D Elliptical Masking
- Filtered Backprojection, Iterative-W, OSEM 2D, or OSEM 3D (optional) Reconstructions
- Coincidence Reconstruction
- True 3D Reconstruction Zoom
- Trial Mode Reconstruction
- Interactive Filter Tool
- Interactive Masking / Centering

### General Reconstruction (TOMO Reconstruction Activity)

- Process up to 5 series simultaneously
- Multi-Isotope support (6 per series)
- Standard Tomography and Dynamic Tomography reconstructions
- Separate reconstruction parameters per series / isotope
- 3D Elliptical Masking
- Filtered Backprojection, OSEM 2D or 3D (optional) Reconstructions
- 3D Reconstruction Zoom
- Trial Mode Reconstruction
- Interactive Filter Tool Interactive Masking / Centering
- Chang's Attenuation Correction

### Quality Control (Quality Control Activity) Features

- Sinogram, Linogram, and Summed Image
- Cine with reference line
- Automatic and Manual Motion Correction
- Static X / Y / Copy / Paste
- Dynamic X / Y / Copy / Paste
- Gated Histogram Review
- Tomo X / Copy / Paste
- Dynamic Tomo Repeat X / Copy / Paste
- Dynamic Tomo X / Copy / Paste / Repeat Rejection

### Image Fusion

- Automatic adjustment based on pixel size

## Description

- Volume translation and rotation operations
- Manual, interactive volume manipulations
- Manually enter desired translation and rotation parameters
- Adjustable alpha blending display
- Selectable viewing angles
- Choice of output matrix size (64, 128, or 256)
- Landmark registration technique

### Organ Based Processing

#### **3D Reorientation**

- Free angle reorientation of reconstructed series
- Process up to 4 series simultaneously
- Process 1 series to create 3 different series, each in a different plane

#### **Cardiac Planar Gated Blood Pool**

- Left and Right Ventricular EF Analysis
- Regional EF Analysis
- Automated Image Filtering
- Automatic or Manual ROI determination
- Functional Image Creation
- Curve Analysis
- Filling and Emptying Rate Analysis

#### **Shunt Analysis**

- Automatic Composite Creation
- Curve Smoothing and Fitting Options
- Integral Calculation for Patient and Shunt Curve
- Shunt Qp/Qs via Area Method
- Shunt Qp/Qs via Height Method

#### **Lung Analysis**

- Total or Segmented analysis
- Perfusion Quantitation
- L/R Lung Comparison
- Geometric Mean Calculation
- Single Lung Processing

#### **Thyroid Analysis**

- Automatic or Manual ROI determination
- Uptake, Count rate, Area and Volume Calculations
- Single Lobe Processing
- 6 and 24 Hour Uptake

#### **Renal Analysis**

- Automatic or Manual ROI Determination
- Gates GFR
- Oberhausen ERPF
- Itoh ERPF
- Oriuchi MAG3
- MAG3 without Blood Sample
- Transplant
-

## Description

- Curve Analysis
- R/L Ratio
- Bubeck (TER) Processing

### Gastric Emptying Analysis

- Automatic or Manual ROI Determination
- Dual Isotope / energy window support
- Geometric Mean Calculation
- Curve Fitting Routines
- Liquid / Solid Processing
- Emptying Calculations

### Hepatobiliary

- Automatic or Manual ROI Determination
- EF Calculations
- Dynamic and Static Methods supported
- User Defined Interval EF Processing

### Brain Analysis

- ROI Quantitation and Ratio Analysis
- Bloodflow Analysis
- Patlok Plot & Cerebral Bloodflow
- Lassen Method
- IMP
- IMP-ARG
- NIMS

### Image Manipulation

- Series Filter
- Series Arithmetic
- Series Reformat
- Series ROI & Curve

The Reconstruction Engine includes a three dimensional iterative reconstruction method with resolution recovery and scatter correction. It also includes statistics-based adaptive de-noising and de-blurring of planar images and longitudinal whole body bone scans. It can be used to shorten the acquisition time of planar images, bone scans or SPECT studies without loss in image quality. This reconstruction method can also improve overall image quality with better contrast, higher resolution, and decreased image noise when used to reconstruct full-time studies. This packages provides syngo MI Workflows with half-time acquisition parameters and optimized reconstruction settings and filters, specifically designed to acquire whole body SPECT scans in the time of a conventional whole body bone scans and to increase the scan speed of whole body bone scans to shorten scan time.

Applications include: Flash3D and Scatter Correction for general and cardiac exams as well as Planar ½ Time Imaging.

Specifications:

1.4 KVA

Input configuration: 120 VAC, 5-15P

Output configuration: 120 VAC, (6) 5-15R

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## Description

With the use of optimized workflows included in this Neurology Engine, one can combine standardized anatomy and a comprehensive normal <sup>99</sup>Tc-ECD database with advanced fusion techniques, to enable automatic correlation of the patient's study with an average brain for quick computation of abnormalities. The fusion engine produces results that are reliable and reproducible between multiple sessions and multiple users. The superior quantification tools include voxel-by-voxel and regional evaluation of abnormal brain perfusion and automatic positioning of anatomical regions of interest which are optimized for evaluation of dementia. Additional anatomical brain regions of interest are possible which makes this application flexible to evaluate a number of neurological disorders. In addition, several anatomical regions may be selected for quick assessment of a single patient scan or for quantitative comparison to other scans. Unique fusion techniques, automated evaluation steps, and comprehensive quantification tools meet the needs of the emerging SPECT or SPECT and independently acquired CT neurological evaluations. A reporting mechanism is also incorporated to help ensure consistent patient reporting.

Applications include: syngo Scenium SPECT

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Enabled by xSPECT technology, this revolutionary acquisition and reconstruction technique brings quantitative SPECT imaging into the reach of all clinical laboratories.

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Enabled by xSPECT technology, this revolutionary reconstruction technique provides SPECT bone images with CT clarity.

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The useful life of the 111 MBq (3.0 mCi) Co-57 point source is 1 year.

Sources that have been replaced are returned to the source vendor for disposal. Return shipment costs are not included in the purchase price.

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