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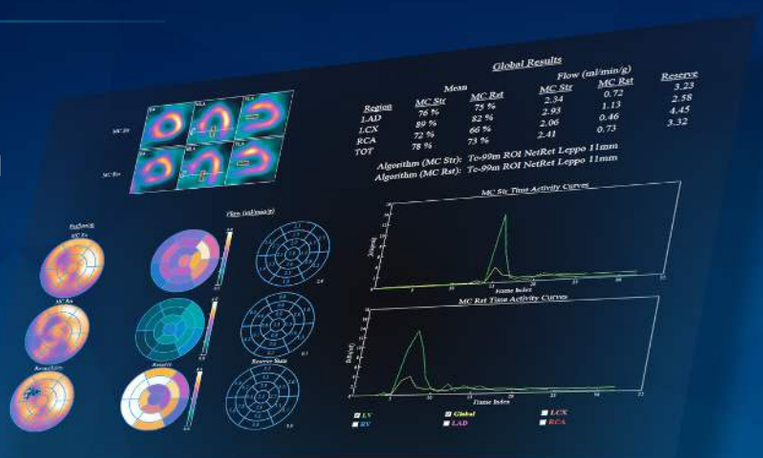
D-SPECT® Series

Industry Breakthrough, Dynamic SPECT Acquisition



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Nuclear Cardiology in the 21st Century

In the 21st century, most nuclear cameras are still relying on a technology invented in the 1950's (crystals and vacuum tubes). Spectrum Dynamics Medical changed all that several years ago with the introduction of the first clinical Cadmium Zinc Telluride (CZT) based nuclear cardiac imaging system – the D-SPECT® and now the next generation, D-SPECT® Series.

D-SPECT Features	Benefits
Flexibility to image supine, upright, and anything in between	Image even the most technically challenging patients
Chair/bed weight supports patients up to 1,000 lb/454 kg	Ability to image morbidly obese patients
Open design with no gantry motion	Eliminates claustrophobia & reduces chance of patient motion
Small camera footprint	Ideal for facilities with rooms as small as 9'5" x 11' (2.9m x 3.3 m)
Detector sensitivity up to 10x that of conventional cameras	Shorter imaging time, dose reduction, & ability to quantify coronary blood flow
Columns of CZT detectors with Tungsten collimators	Opens the door to new clinical applications
Innovative proprietary reconstruction algorithm	Exceptional image resolution and quality

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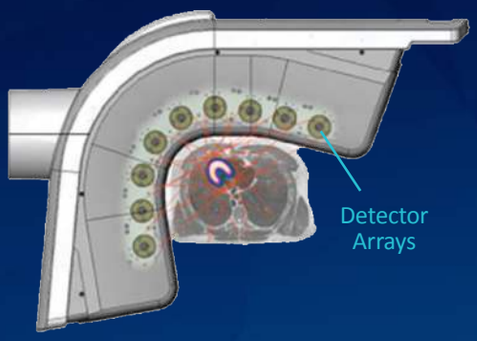
Where it All Starts...

From the inventors of Broadview, swiveling CZT detectors:

Digital CZT-Based Detectors

The CZT modules, which consist of CZT plus the electronics, are populated on a column with Tungsten collimators in front which channel the photons to the detector array. Using Tungsten collimators rather than lead eliminates potential lead X-ray which can degrade image quality.

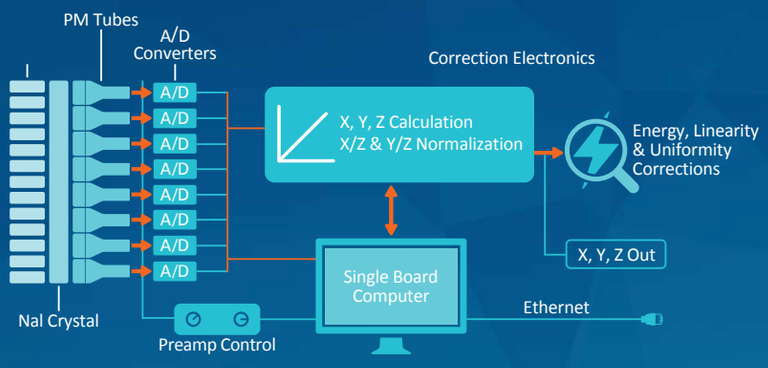
The semiconductor, CZT, combined with our unique implementation of hardware and software, offers superior performance advantages over Sodium Iodide. The most important is the dramatic improvements in sensitivity and energy resolution. This gives the D-SPECT Cardio the ability to acquire low dose and simultaneous multiple energy studies.



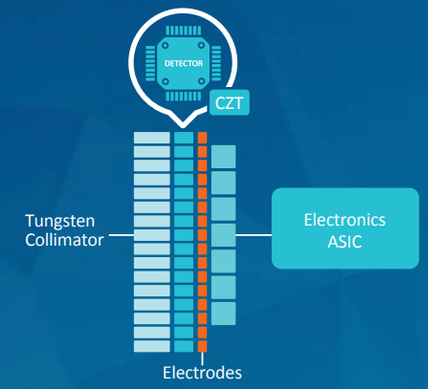
Detector Configuration and ROI-Centric Scanning

Comparison of Anger Scintillation and D-SPECT Cardio Solid State Technology

Anger Scintillator Technology



D-SPECT Cardio Solid State Technology



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Gantry and Chair/Bed Design

The D-SPECT Cardio gantry design is simple, yet elegant. The system is counter-balanced for easy and smooth motions. Gantry positions are locked in place with electromagnetic brakes.

The unique design of the D-SPECT provides several advantages including:

- Small camera footprint.
- Open gantry design eliminates claustrophobia.
- Chair weight supports patients up to **1,000 lb/454 kg** for morbidly obese patients.
- Flexible imaging chair/bed can be fully-upright, supine or anything in between to fit any clinical requirement. Patients can easily stabilize themselves as they stand or sit using the integrated grab bar.
- Unique gantry/detector design eliminates the need for the patient to place their left arm behind their head, improving patient comfort and reducing the chance of motion.
- Integrated on the detector is a touchscreen, where the operator can start the Pre-Scan positioning acquisition to:
  - Display the angle of the chair/bed and detector from the current and previous scan.
  - Display position of the heart within the field-of-view.

Displays the angle of the chair/bed and detector

Displays position of heart within the field-of-view

Innovations that Transform Digital SPECT Imaging

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Acquisition and Advanced Reconstruction Algorithms

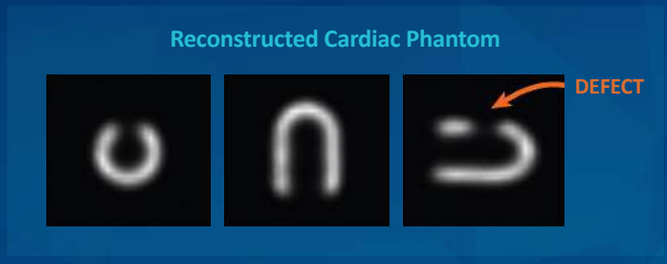
List Mode Acquisition

All acquisitions are acquired in list mode. This provides the capability to re-frame the data, allowing the operator to change a number of different parameters.

- Adjust the R-Wave windows
- Apply scatter correction and process the multiple isotope acquisitions within seven different energy windows
- Adjust energy window or compare different energy windows for the same acquisition

Reconstruction

Our advanced reconstruction algorithm is based on an OSEM iterative algorithm with resolution recovery. Multiple reconstruction options are included within the reconstruction software.



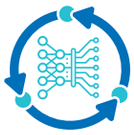
The Model based reconstruction is a proprietary Spectrum Dynamics Medical algorithm and starts iterations from a Model of the LV instead of a uniform image.

This Model is calculated on initial OSEM iterations using identified myocardium contours to create a Model that will be used as “Initial Guess.” This method helps the reconstruction algorithm converge more quickly on an optimal solution and demonstrates a significant improvement of image properties and quality.

BroadView Technology
High sensitivity swiveling digital detectors

Open Gantry
Preferred by patients, choice of scan position

Adaptive Field of View
ROI-Centric: scan focused where the heart is



Superior Image Quality
Advanced reconstruction for SPECT, 3D dynamic imaging

TruSPECT Workstation
TruCorr: Deep Learning Attenuation Correction

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Clinical and Workflow Benefits

Fast results: The D-SPECT can acquire a complete gated SPECT study in as little as two minutes, improving clinical workflow, enhancing patient compliance and reducing the chance of patient motion.

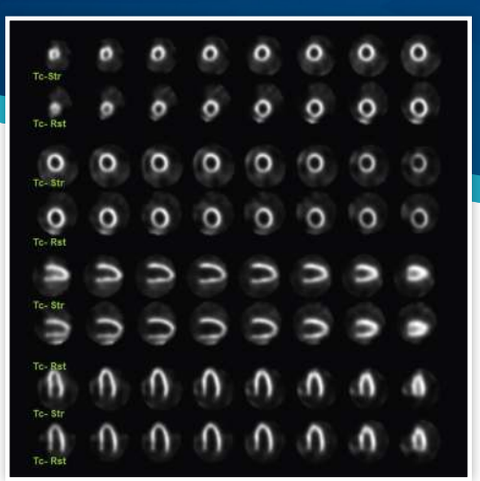
Image quality: D-SPECT's count rich data sets combined with a proprietary reconstruction algorithm ensure optimal spatial resolution and exceptional image quality.

TruCorr: For high quality SPECT, attenuation correction is essential. Spectrum Dynamics has developed a new methodology for attenuation correction for its D-SPECT Series camera. TruCorr uses Deep Learning to generate attenuation corrected myocardial perfusion images.

Dose reduction: The extremely high sensitivity of the D-SPECT detectors allows for dramatic reductions in injected dose. Patients and staff benefit from the lower radiation dose.

Simultaneous multi-isotope imaging (SDI): The exceptional energy resolution of CZT allows the detectors to acquire multiple energies at the same time with minimal down scatter. This makes simultaneous stress and rest imaging possible with perfect imaging registration, as well as new advanced multi-isotope protocols such as 123I-mIBG or 201-Tl and 99mTc Sestamibi or Myoview.

Patient compliance: The open gantry design and the ability of the CZT columns to "swivel" back and forth allow the nine detectors, in an L-shaped array, to acquire data from the patient's Left Posterior Oblique (LPO) to Right Anterior Oblique (RAO) without the need to rotate the detectors around the patient. This eliminates the chance of an acquisition collision, pinch points or claustrophobia that moving detectors can cause.



Two-minute gated SPECT study with standard doses.

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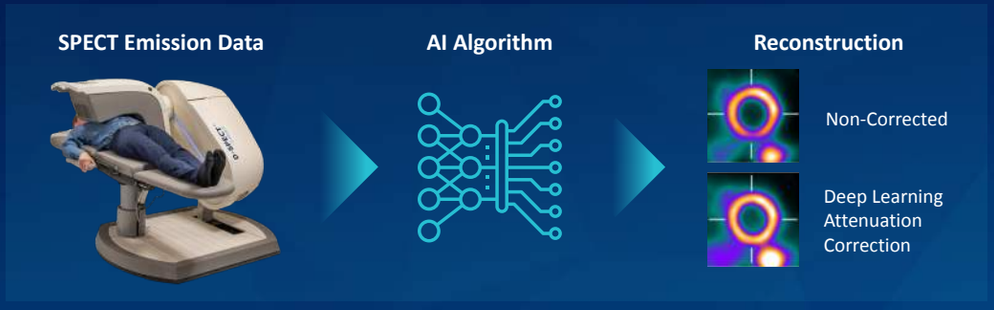
A Patient-Centered Innovation

TruCorr: Addressing the challenges created by attenuation artifacts

Spectrum Dynamics has developed a new methodology for attenuation correction for its D-SPECT digital cardiac camera. TruCorr is a revolutionary approach that uses Deep Learning to generate attenuation corrected myocardial perfusion images.



TruCorr Attenuation Correction vs Deep Learning Attenuation Correction

TruPlanar Imaging Acquisition Workflow

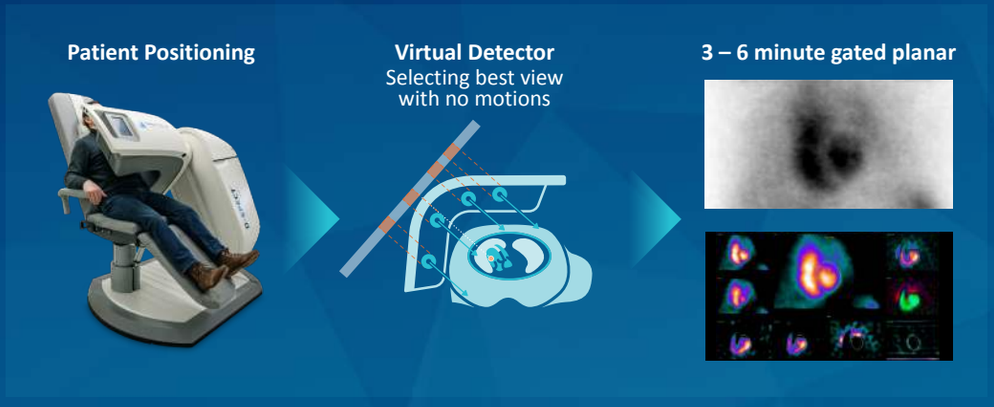


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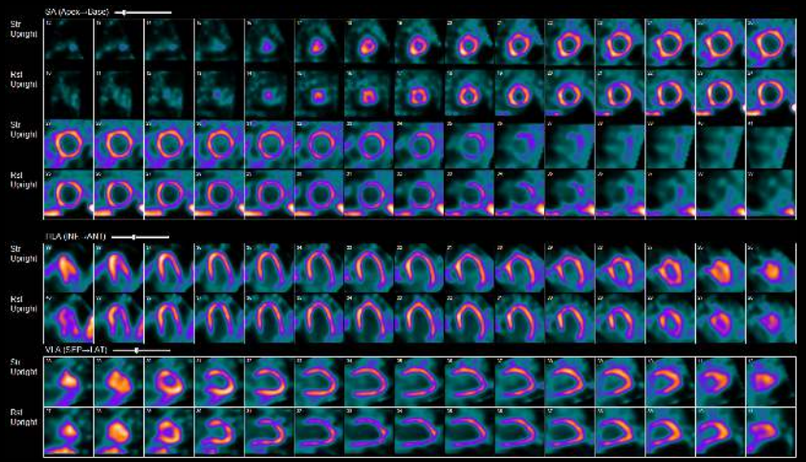
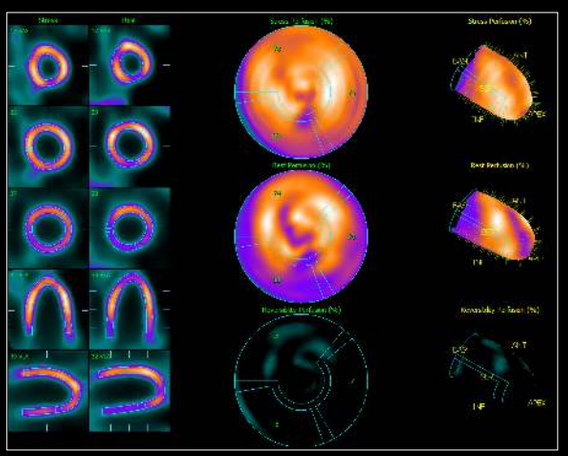
Image Gallery

PRODUCT



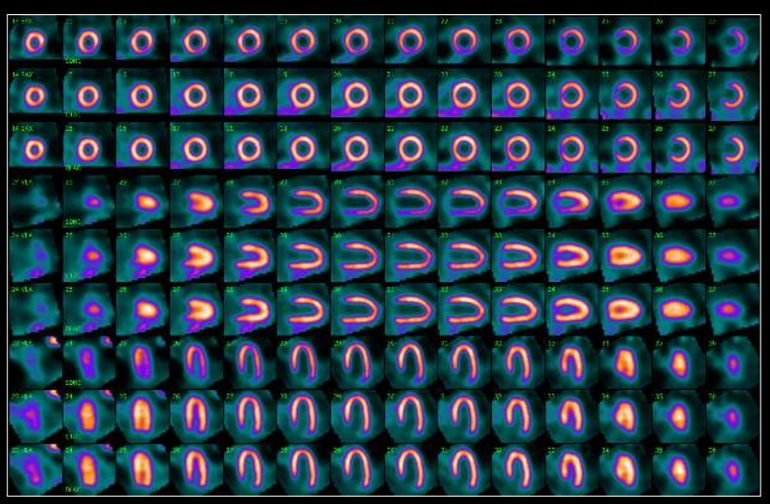
D-SPECT VISTA high BMI

APPLICATION



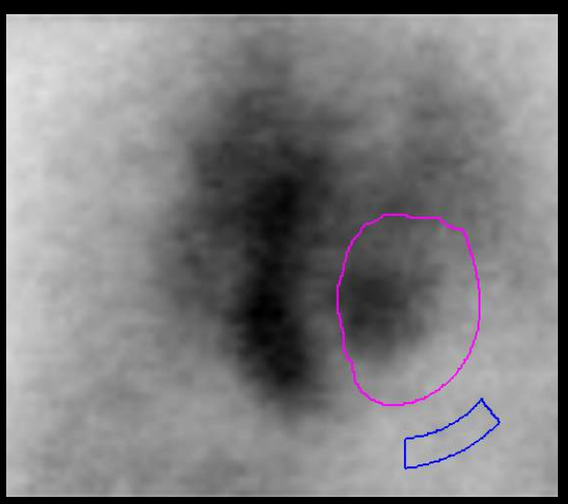
D-SPECT 63 BMI

DOSE



D-SPECT TruCorr: 1. Uncorrected MPI, 2. CTAC MPI, 3. TruCorr MPI

TIME



D-SPECT TruPlanar 5 minutes MUGA (EARNA)

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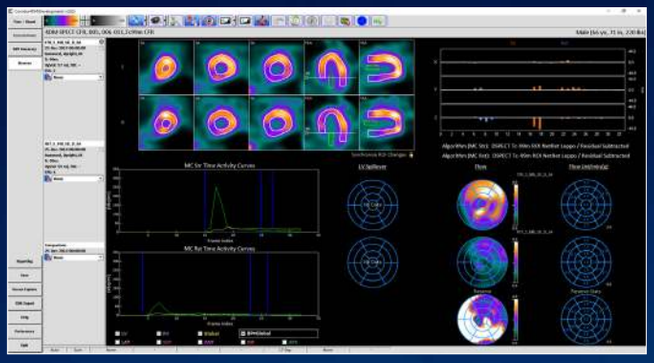
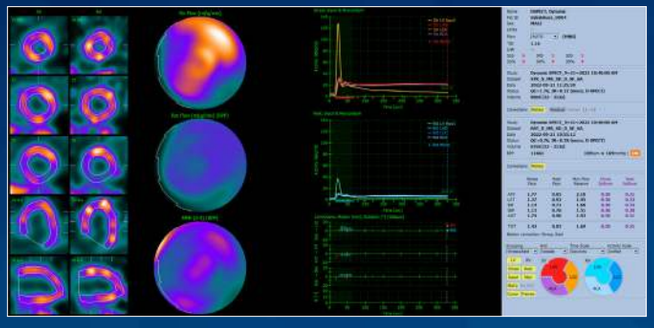
TruFlow Dynamic Imaging





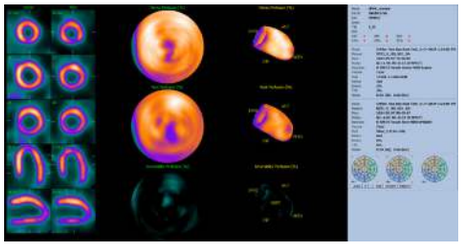
Highest sensitivity of any dedicated cardiac SPECT system provides the data needed for dynamic SPECT.

List mode acquisition and spline reconstruction provide flexibility for traditional, fast and future dynamic protocols.

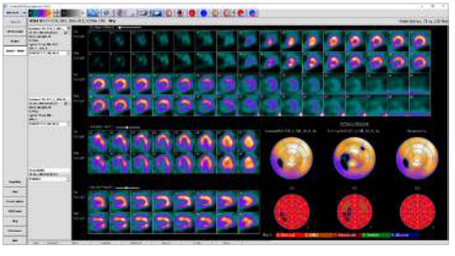
Leveraging the latest quantitative tools for quality and MFR analysis.

Available Quantitative Cardiac SPECT packages

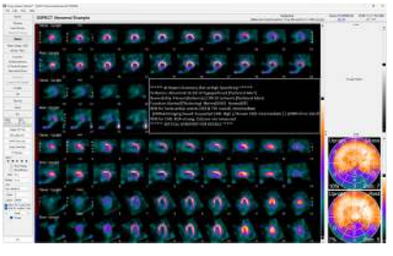
Cedars-Sinai | QGS + QPS



INVIA | 4DM



Syntermed | Emory Toolbox*



*Available in a stand-alone configuration only.

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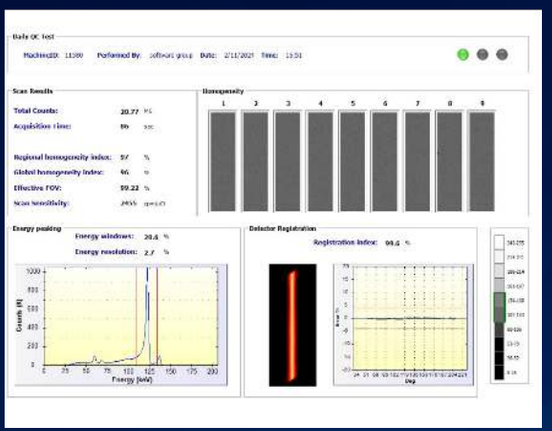
Quality Control & Connectivity

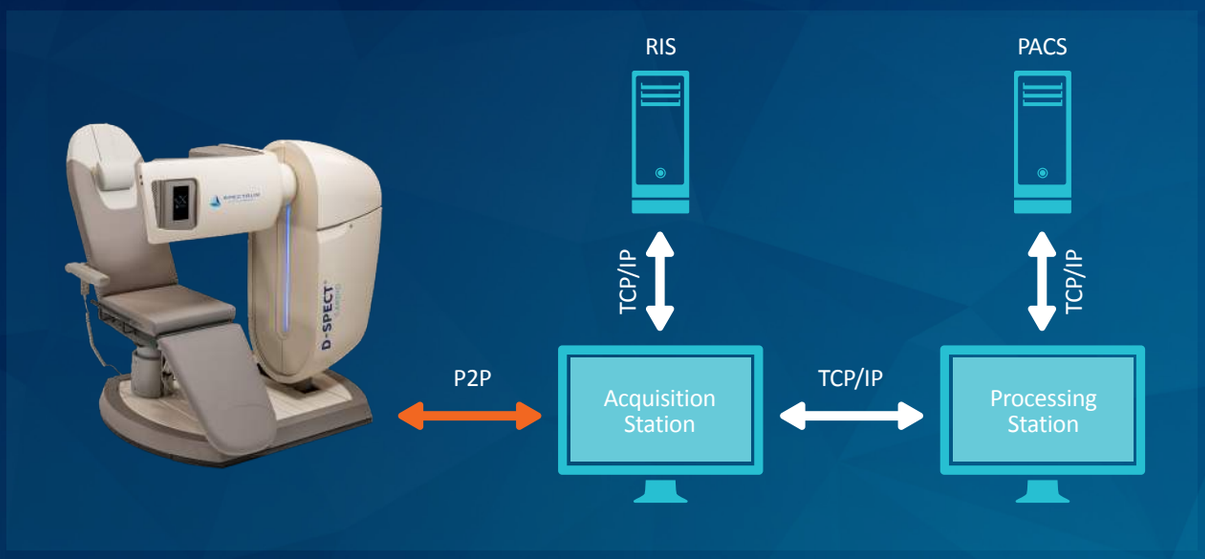
Quality Control

D-SPECT Cardio acquisition software incorporates a very simple to perform ^{57}Co based quality control acquisition that is executed daily and checks all key imaging parameters prior to clinical imaging. The procedure only takes a couple of minutes (varies with source strength) to accomplish.



Connectivity

The D-SPECT Cardio can connect and transfer data back and forth to a wide variety of HIS/RIS systems, PACS servers and other imaging devices using the DICOM standard. If you have questions regarding specific devices, Spectrum Dynamics Medical personnel can work on-site with your IT department to demonstrate connectivity and data transfer procedures.



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Serviceability and Remote Diagnostics

The D-SPECT Cardio system was designed from the ground up with remote connectivity in mind. With the site's permission, regional specialists and/or factory trained engineers can log into your D-SPECT Cardio and perform almost any of the diagnostic technical functions a Field Service Engineer can complete on-site. Except for a part's replacement, it is often possible to correct or implement a workaround solution remotely, allowing imaging to continue while waiting for a technician to arrive on-site.

With a team of specialists who can assist you remotely and some of the most experienced service engineers throughout the world, we are able to correct most problems immediately and maximize your site's uptime.

Contact Us

Spectrum Dynamics Medical appreciates the opportunity to share our Nuclear Imaging solutions with you. To learn more about our products, services and how we can help you, please contact us.

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