Cardiac Digital SPECT Imaging

D-SPECT® CARDIO

9-detectors CARDIO System

D-SPECT® VISTA

6-detectors VISTA System

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Where It All Starts...
Six or Nine 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 the ability to acquire low dose and simultaneous multiple energy studies.

Digital Cardiac SPECT Imaging:
Improved Functionality and Clinical Capabilities

Workflow Customization: optimize workflow with shorter imaging times. Customize new clinical procedures such as MUGA, Cardiac Amyloid, based on True Planar Imaging.+

Alternatives to Reduce Radiation Dose: efficient detector technology plus advanced reconstruction algorithms allow for lower injected activity. Stress-only imaging, facilitated by image quality and Emission Map Attenuation Correction.+ Improved IQ with no additional exposure.

Patient Based Imaging: adapt to patient's body type, flexibility and tolerance. Options to image upright, supine and any option in between. No need to image with arms up so patients are at ease during scan.

Analog Cardiac SPECT Imaging:
Standard Capabilities

Limited Flexibility - Due to bore size, table weight limit, some scanners limited to supine imaging only for large patients or patient unable to lay prone.

Limited Clinical Applications - Analog design does not allow dynamic imaging for advanced diagnostic capabilities such as myocardial flow reserve analysis.

Obsolescence - Fork-lift requirement or no path to solid state digital SPECT technology. Hardware limitations for dynamic imaging applications.

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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.

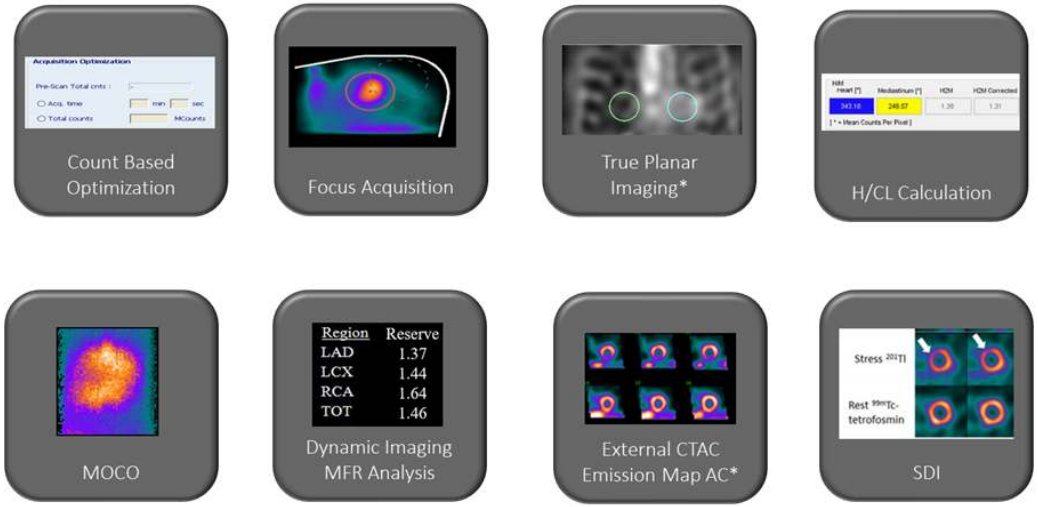
Image quality: D-SPECT count rich data sets combined with a proprietary reconstruction algorithm ensures optimal spatial resolution and exceptional image quality.

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 image registration, as well as new advanced multi-isotope protocols such as ^{123}I-mIBG or ^{201}Tl and ^{99m}Tc Sestamibi or Myoview.

Patient compliance: The open gantry design and the ability of the CZT columns to “swivel” back and forth allows the nine detectors, in an L shaped array, to acquire data from the patients 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.

Clinical Impact



*Works in Progress

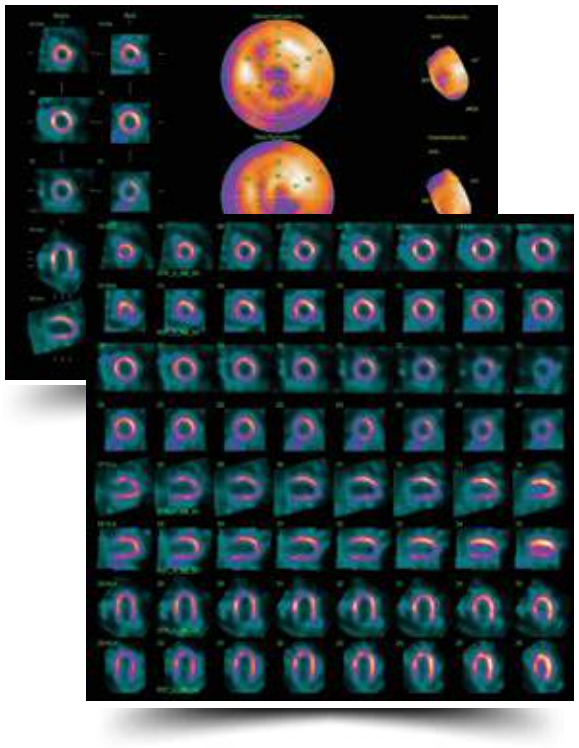
Nuclear Cardiology in the 21st Century

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 CARDIO and D-SPECT VISTA.

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 1000 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
6 or 9 columns of CZT detectors with Tungsten collimators	➔ Opens the door to new clinical applications
Innovative proprietary reconstruction algorithm	➔ Exceptional image resolution and quality

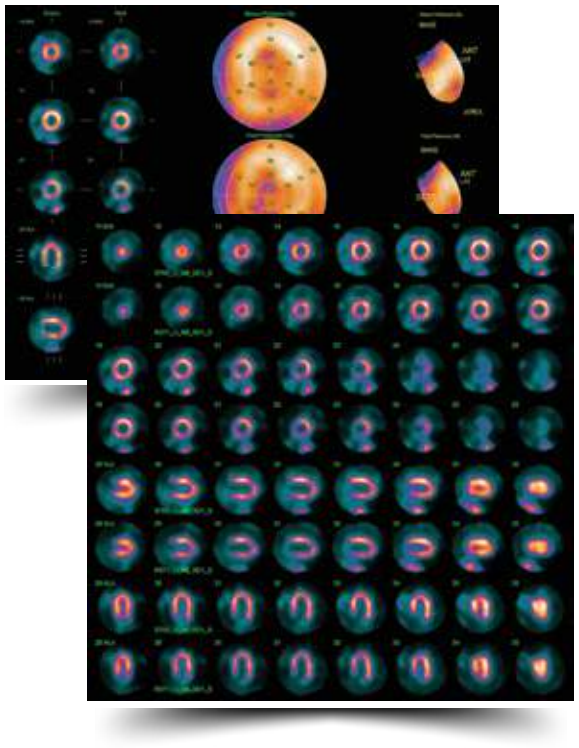
Image Gallery: Digital SPECT

Obese



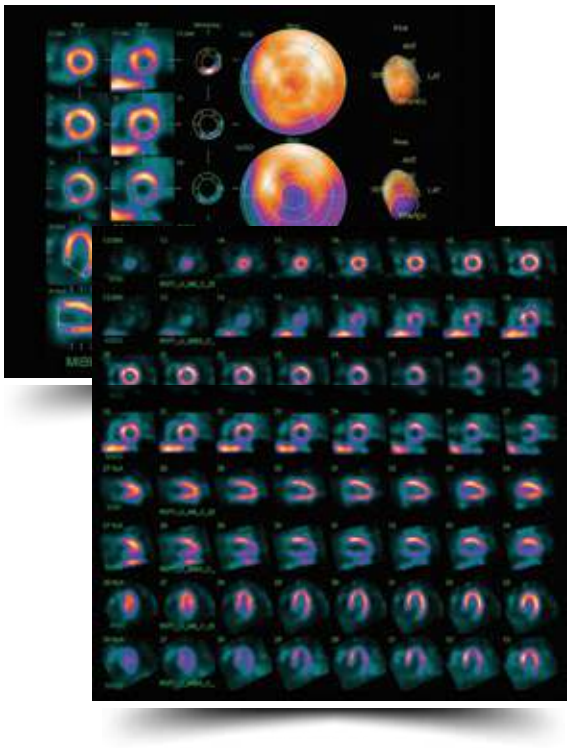
498 lb/226 kg BMI 75.7

Ultra-Low Dose



5 mCi/185 MBq ^{99m}Tc-Sestamibi

SDI



^{99m}Tc-Sestamibi +^{123}I-mIBG

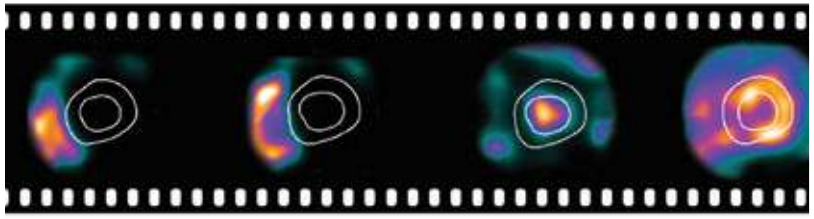
Dynamic SPECT… with D-SPECT CARDIO

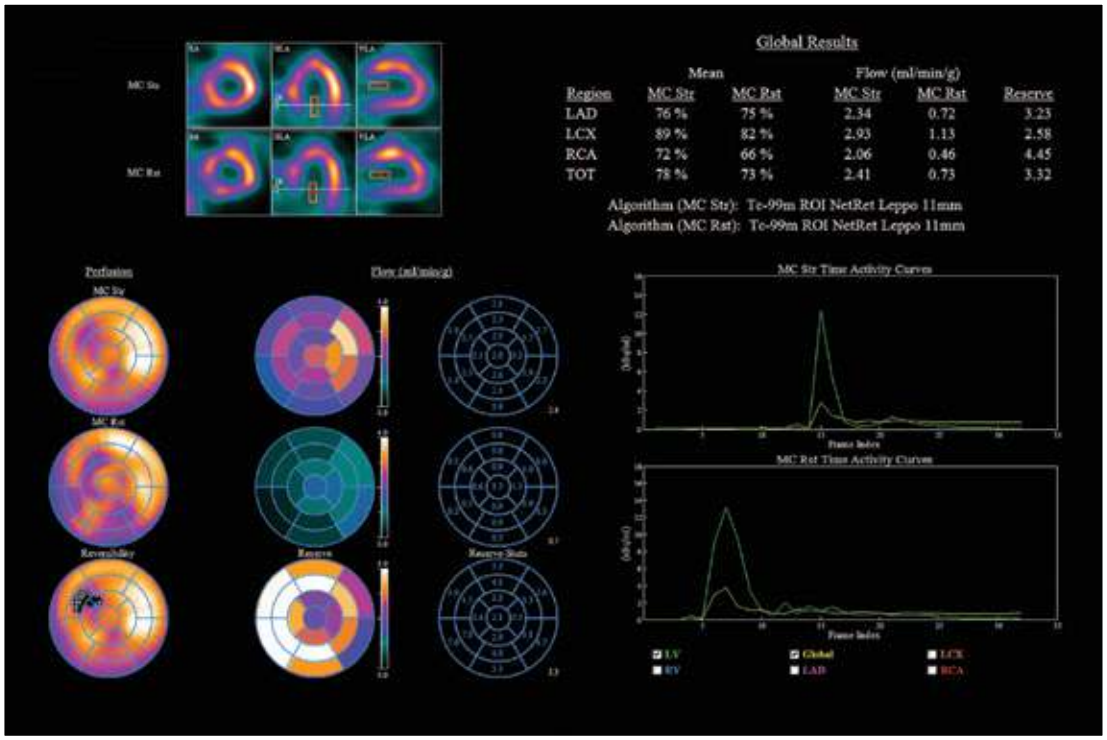
A Breakthrough in Nuclear Cardiac Imaging

Gated SPECT acquisitions have been the mainstay of nuclear cardiac imaging for the last two decades, serving as a non-invasive way to image perfusion and wall motion. Despite improvements in quantitative software over the years, novel applications that provide clinicians with clinically significant diagnostic information simply have not been available, until now.

D-SPECT Cardio's unique implementation of CZT and reconstruction software lays the foundation for Dynamic SPECT acquisitions. The D-SPECT Cardio rapidly images the bolus injection of ^{99m}Tc-Sestamibi as it passes through the left ventricle of the heart.

Based on the reconstructed frames, the quantitative software (INVIA) analyzes the bolus and extraction of the radiopharmaceutical by the myocardium to calculate the Coronary Flow Reserve (CFR) by coronary artery. This information can be crucial to diagnose multi-vessel and microvascular disease and used to be only available for PET.





D-SPECT® VISTA

There is a definitive path
from NaI Anger system to CZT digital technology
in nuclear cardiology with D-SPECT VISTA.

Cardiac applications: Myocardial Perfusion Imaging,
Cardiac Amyloid, ERNA

D-SPECT VISTA, the latest addition to the D-SPECT® family, is specifically designed as an affordable entry into digital, solid-state Cadmium Zinc Telluride (CZT) myocardial perfusion imaging (MPI) for institutions wishing to transition from an older, analog (NaI Anger) cardiac scanner. The improvements in image quality with digital technology, workflow, dose management, and patient comfort are key benefits to be experienced with VISTA. As your needs grow, VISTA can be upgraded to provide additional quantitative diagnostic applications, such as dynamic imaging for Myocardial Flow Reserve Analysis.

D-SPECT Features and Benefits

D-SPECT VISTA workflow improvements vs. NaI analog system: shorter acquisition times, less repeats as patients favor upright imaging vs arms-up supine imaging; ease of use for the technologist.

Full range of cardiac clinical capabilities: myocardial perfusion imaging, cardiac amyloid imaging and ERNA D-SPECT is the only digital cardiac-only system with **True Planar Imaging*.** You decide optimal imaging protocol based on patient's needs and comfort.

Customize imaging workflows with lower injected dose or shorter acquisition times.
Perfusion scans as fast as 4 minutes (based on ~22mCi/814MBq dose, LV counts and patient BMI)

Improve image quality for accurate diagnosis with applications such as **Emission Map Attenuation Correction*** , Simultaneous Dual Isotope Imaging.

*WIPs

Once you transition from analog imaging to D-SPECT VISTA, you also have a path of obsolescence protection: upgrade to D-SPECT CARDIO for advanced cardiac applications: Myocardial Flow Reserve analysis as part of your myocardial perfusion imaging workflow.

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D-SPECT® CARDIO

D-SPECT® VISTA

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