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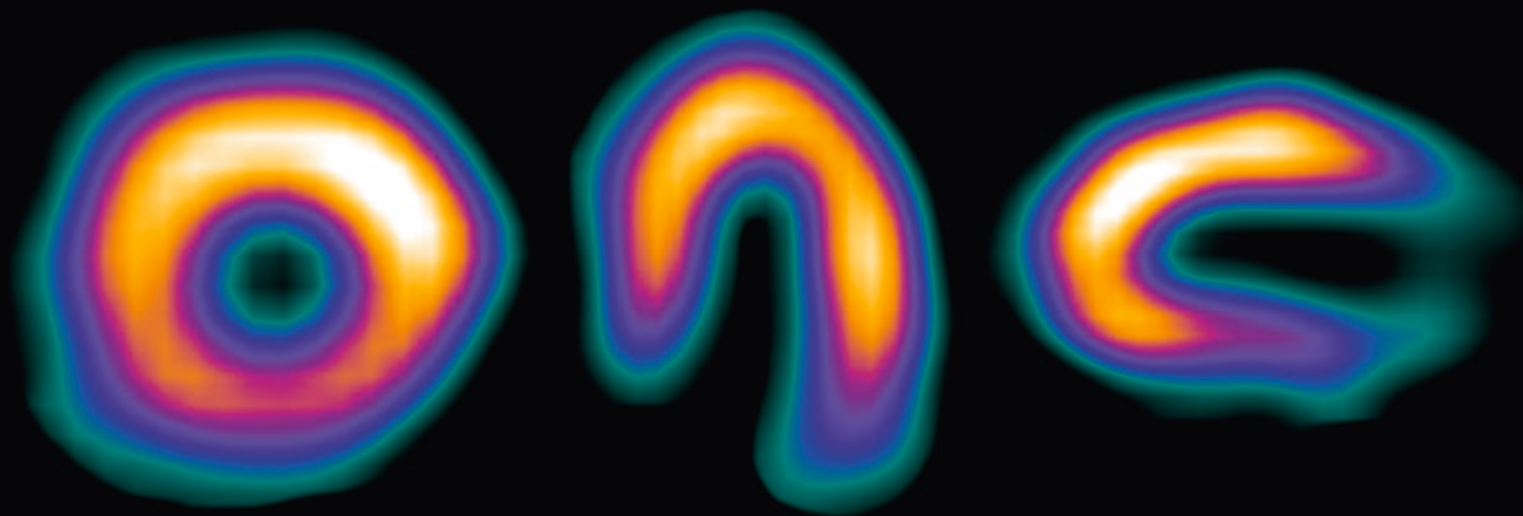
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www.siemens.com/iq-spect

The Art of Minimizing Dose While Maximizing Speed

IQ•SPECT Customer Experiences

Answers for life.

Minimum Dose and Maximum Speed

IQ•SPECT

In nuclear medicine studies, image quality is determined by the number of detected photons, patient motion and truncation. When imaging a small organ, such as the heart, much of the large-field-of-view detector with a conventional parallel hole collimator is not used.

As a result, to achieve the desired image quality, routine cardiac studies can take up to 16 minutes, limiting the number of patient scans and, most importantly, exposing patients to unnecessary radiation.

With these challenges in mind, Siemens Molecular Imaging, developed IQ•SPECT, a unique solution to maximize detected counts from the heart without truncation and offer fast cardiac imaging at the lowest possible dose, while maintaining high image quality.

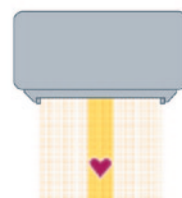
With a selection of optimized protocol options, physicians now have the ability to maximize their myocardial perfusion imaging (MPI) studies:

- 4 minutes, standard dose
- 8 minutes, half-dose
- 16 minutes, quarter-dose

Exclusive IQ•SPECT Technology

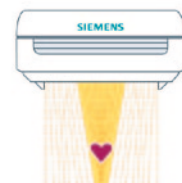
SMARTZOOM Collimation

Conventional parallel-hole collimators are not ideal for small organs, requiring longer scan times or higher injected dose to acquire the necessary number of counts for optimal cardiac image quality.



Conventional

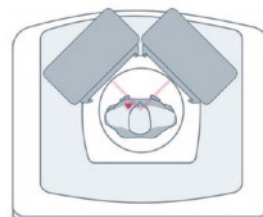
Siemens **SMARTZOOM** collimators employ the magnifying properties of a focusing collimator near the center of the field-of-view and behave like a parallel hole collimator toward the edge of the field-of-view, reducing truncation. This enables the detectors to zoom in on the heart for four-times more sensitivity.



IQ•SPECT

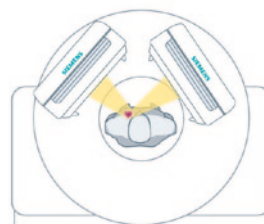
Cardio-Centric Acquisition

Conventional scanners use parallel-hole collimators and orbit around the center of the gantry. Detectors rotate in close proximity to the patient, often causing feelings of claustrophobia.



Conventional

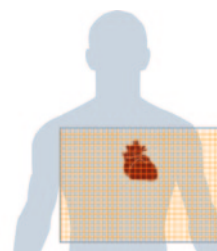
IQ•SPECT positions the heart in the center of the collimator field-of-view and aligns the detectors at a 28 cm radius, establishing a cardio-centric orbit. IQ•SPECT uses the flexibility of the Symbia gantry to position each detector at an optimal distance to maximize sensitivity.



IQ•SPECT

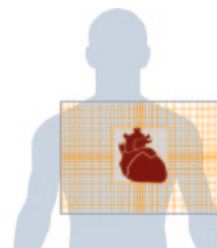
Advanced Reconstruction

Most conventional reconstruction algorithms do not fully account for detector motion, deflections of the gantry, collimator hole size and shape and distance from the patient to the detectors. This may result in artifacts that affect image quality.



Conventional

Advanced IQ•SPECT reconstruction accurately incorporates the measured geometry of the **SMARTZOOM** collimators and the cardio-centric orbit of the detectors. Measurements of size, shape and pointing direction for all 48,000 holes in the **SMARTZOOM** collimator enable accurate image reconstruction.



IQ•SPECT

Clinical, Operational and Financial Value






Clinical

To achieve optimal image quality, conventional cardiac imaging requires a longer exam time or high injected dose. From a patient perspective, both may be unpleasant and unsatisfactory.

Myocardial perfusion exams require that patients remain still for the total duration of the scan to avoid motion artifacts that ultimately impact image quality. The alternative is to reduce the exam time by increasing the amount of injected dose. This is not only undesirable, but potentially harmful to the patient as it will increase radiation exposure over time.

With IQ•SPECT physicians not only have the ability to reduce scan time but, most importantly, reduce patient radiation exposure without jeopardizing image quality.

By acquiring four-times more counts than conventional scans, IQ•SPECT delivers a complete cardiac workup in less than 5 minutes, improving patient comfort and satisfaction. The short scan time helps the patient remain still during the duration of the exam, reducing motion artifacts and potentially improving image quality. There is also the opportunity to reduce injected dose by up to 75%* without degrading image quality.

Conventional*				IQ•SPECT		
	Dose	Time	Image Quality	Dose	Time	Image Quality
Standard 	Standard	16 min	Excellent	Standard	4 min	Excellent
Pediatric 	Half	16 min	Sub-Optimal	Half	8 min	Excellent
Bariatric 	Standard	16 min	Sub-Optimal	Standard	8 min	Excellent



Operational

Time affects all aspects of daily imaging, from patient comfort to staff productivity. With increasing patient demand and decreasing reimbursement levels, efficiency is essential.

IQ•SPECT helps clinicians achieve previously unattainable imaging speeds to support faster patient studies, resulting in significant time savings and improved staff efficiency.

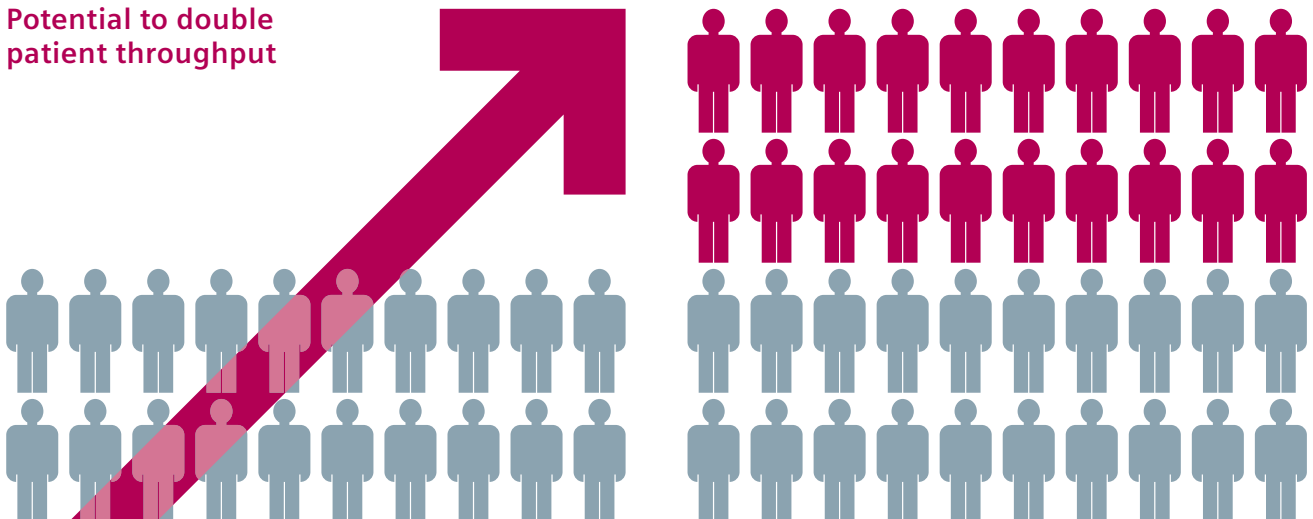


Financial

Two challenges in healthcare today are the mandates to improve patient safety and increase productivity. From a patient care and economic perspective, each is critically important. With conventional systems, clinicians have to choose between minimum dose to protect patients or faster scanning for greater productivity.

IQ•SPECT addresses these challenges and enables the lowest dose to be used, while scanning patients faster than ever before. By imaging up to 75%* faster, institutions will have the ability to see more patients daily without purchasing a secondary scanner.

Potential to double patient throughput



* Based on competitive literature available at time of publication. Data on file.

30% More Patients, 40% Less Dose

Hôpital de la
Cité-de-la-Santé

Laval, Québec, Canada



Profile

- Regional hospital with 500+ beds located in a fast-growing metropolitan area
- Nuclear medicine department composed of 4 physicians and 15 technologists
- Annually performs 3,500+ MPI studies, using 2-day protocols
- 2 Symbia™ SPECT•CT systems

Challenge

- Large patient demand for cardiac studies
- Cardiac studies were performed on both cameras
- 30 patients scanned daily (rest and stress studies)
- Scan time: 12 minutes; rest injected dose: 25 mCi
- Long waiting list for bone scans required patients to be referred to other centers
- Patient waiting list for MPI studies was more than 3 months and 6-9 months for external referrals

Solution

- IQ•SPECT installed on a Symbia SPECT•CT system
- Cardiac studies are performed on one camera and general SPECT•CT exams on the other
- 40+ patients scanned daily (rest and stress studies)
- Scan time: 4 minutes; rest injected dose: 15 mCi
- Bone scans no longer referred elsewhere
- Cardiac patient wait-time is less than 2 months



Clinical

*“We were looking to decrease the dose from 25 mCi to 15 mCi of Sestamibi in our facility... As far as acquisition goes, IQ•SPECT is four-times faster than a conventional study.”**

Guillaume Bouchard, MD,
Department of Nuclear Medicine



Operational

*“This [Symbia with IQ•SPECT] freed up four to five hours of camera time. It allowed us to simplify our schedule and see more patients.”**

Marie-Josée Haeck, Manager,
Diagnostic Imaging



Financial

*“Now, we have reduced our wait-time and we can perform more patient scans.”**

Marie-Josée Haeck, Manager,
Diagnostic Imaging

*“One day, we performed 56 cardiac SPECT tests.”**

Jean-Paul Bernier, Technologist,
Department of Nuclear Medicine

100% More Scans, Up to 65% Less Dose

Pró-Cardíaco Hospital
Rio de Janeiro, Brazil



Profile

- Tertiary cardiovascular hospital specializing in complex heart procedures
- 100 patient beds
- Symbia T2 SPECT•CT system

Challenge

- Scan times were more than 20 minutes
- Total scans per day: 11-12
- High demand for more cardiac scans
- Space restrictions would not allow an additional system

Solution

- IQ•SPECT installed on a Symbia T2 SPECT•CT
- Total scan time per patient was reduced by 75% to just 5 minutes
- Total scans per day doubled to 22-24
- Injected dose was reduced by 25% for regular scans and up to 65% for stress-only scans



Clinical

*“We have 25% less dose than our previous scans. When we use stress-only images, we can reduce our dose by up to 65%, have better image quality with increased counts and attenuation-corrected images.”**



Operational

*“We reduced our acquisition time from over 20 minutes to just 5 minutes.”**



Financial

*“With IQ•SPECT we doubled the number of cardiac scans from 11-12 per day to 22-24 scans per day. In peak periods, we have performed up to 32 scans in a 12-hour working day. Within the first 18 months, we have scanned over 2,000 patients using IQ•SPECT.”**

Cláudio Tinoco Mesquita, MD,
Head of Nuclear Medicine Department

80% Faster Scans, Increased Patient Satisfaction

University of Michigan
Health System

Ann Arbor,
Michigan, USA



Profile

- Wholly owned academic medical center of the University of Michigan
- Nuclear medicine department is comprised of approximately 30 physicians and scientists
- 6 SPECT and 3 SPECT•CT systems

Challenge

- Scan times were 15-20 minutes
- Patients suffering from a history of heart failure or lung disease had difficulties laying flat for more than a few minutes
- Some severely ill patients could not be referred for a SPECT scan due to their inability to tolerate a 15-20 minute nuclear cardiology exam

Solution

- IQ•SPECT installed on a Symbia T16 SPECT•CT
- The site initiated a clinical study to evaluate the benefits of IQ•SPECT versus conventional scans
- Conventional 15-20 minutes scans were performed with LEHR on 54 patients, who were then scanned again on the same system using the 4-minute IQ•SPECT exam
- The study concluded that 4-minute MPI with IQ•SPECT provides image quality comparable to conventional 15-20-minute scans using LEHR, with a significant potential for dose savings



Clinical

*“If you use half the radionuclide dose and increase the image acquisition time to a 6-minute scan, you would have the same image statistics as a full-dose exam.”**



Operational

*“Symbia T16 with IQ•SPECT permits use of the same imaging system to perform SPECT•CT nuclear medicine exams, and in a matter of a couple of minutes, transform into a quick cardiac imaging system. The IQ•SPECT option offers a nice degree of flexibility.”**



Financial

*“The patients like it a lot and it opens up the possibility of referring patients who were unable to tolerate a conventional SPECT scan simply because they were too sick.”**

James Corbett, MD, Director,
Cardiovascular Nuclear Medicine Division

100% More Patients, Lowest Possible Dose

Amphia Hospital,
Molengracht Campus

Breda,
The Netherlands



Profile

- Teaching and research institution
- One of the largest general hospitals in The Netherlands
- 837 patient beds
- Symbia T16 SPECT•CT system

Challenge

- Scan times were 18 minutes
- Patients often complained about having to remain still for the duration of the scan
- Re-scans were often needed due to patient motion during the exam
- Cardiac cases were the majority of studies performed. Stress studies were performed in the morning, while the afternoon was dedicated to rest studies.

Solution

- IQ•SPECT installed on a Symbia T16 SPECT•CT
- Total scan time per patient was reduced by 50%
- Patients satisfaction increased and the number of re-scans decreased
- 15 MPI scans are performed each morning, leaving the afternoon free for other SPECT•CT studies



Clinical

*“We are working at the lowest possible dose that we can, and we allow just 15 minutes per patient.”**



Operational

*“Patient complaints and movements during acquisition were common before IQ•SPECT, sometimes causing us to stop before completing acquisition.”**



Financial

*“Since the upgrade in July 2012, the department has doubled the number of myocardial perfusion scans, performing up to 15 per morning.”**

Jan Akkermans, Manager,
Nuclear Medicine Department

5-Minute Exams, Cost-Effective Service

Ballarat Health Services
Victoria, Australia



Profile

- Largest regional hospital in the Grampians region
- 782 patient beds
- 15 nuclear medicine exams per day
- Symbia T16 SPECT•CT system

Challenge

- Scan times were 15 minutes
- Patients were uncomfortable during conventional MPI exams
- Clinical and financial need to provide high-end, self-sufficient in-house nuclear medicine services

Solution

- IQ•SPECT installed on a Symbia T16 SPECT•CT
- Total scan time per patient was reduced by 67% to just 5 minutes
- Patients feel more comfortable and the likelihood of motion artifacts has decreased
- As part of the introduction of IQ•SPECT, a number of patients were scanned using both IQ•SPECT and the traditional method, demonstrating to clinicians that the IQ•SPECT images were comparable, yet acquired in far less time



Clinical

*“The combination of getting more photons from the heart during exams, and the ability to make better use of the photons, results in reduced scanning time and reduced radiation dose.”**



Operational

*“IQ•SPECT, has helped expedite cardiac exams.”**



Financial

*“It is an extremely cost-effective service; the system itself is easy to use and offers excellent images.”**

Greg Wilton,
Chief Nuclear Medicine Technologist

88% More Scans, Better Image Quality

Halifax Health Medical
Center

Daytona Beach,
Florida, USA



Profile

- The largest healthcare provider with a tertiary and community hospital in the Daytona Beach, Florida, region
- 60% of all nuclear medicine studies are cardiac
- 678 patient beds
- 2 Symbia T2 SPECT•CT systems

Challenge

- Scan times were 20 minutes
- Total patients per day: 8
- Need to offer cardiac imaging solutions that accommodate patients of varying sizes
- Issues with claustrophobic patients due to close detector range
- Frequent patient motion during scans produced low-quality images

Solution

- IQ•SPECT installed on a Symbia T2 SPECT•CT
- Total scan time per patient was reduced by 75% to just 5 minutes
- Total patients per day: 15
- Now able to schedule more patients with claustrophobia
- Image quality has improved due to less patient motion



Clinical

*“Our 5-minute cardiac scans are better than those that used to take 20 minutes. The attenuation correction feature is particularly helpful for heart scans, it allows us to compensate for varying patient body size. It also helps correct for attenuation caused by the diaphragm, breasts and pectoral muscles.”**

Thomas Yuschok, MD,
Nuclear Medicine Department



Operational

*“The quality of the scans means there is less need for rescanning. The turnaround time is so much shorter with IQ•SPECT.”**

Andrea Huffman, Coordinator,
Nuclear Medicine Department

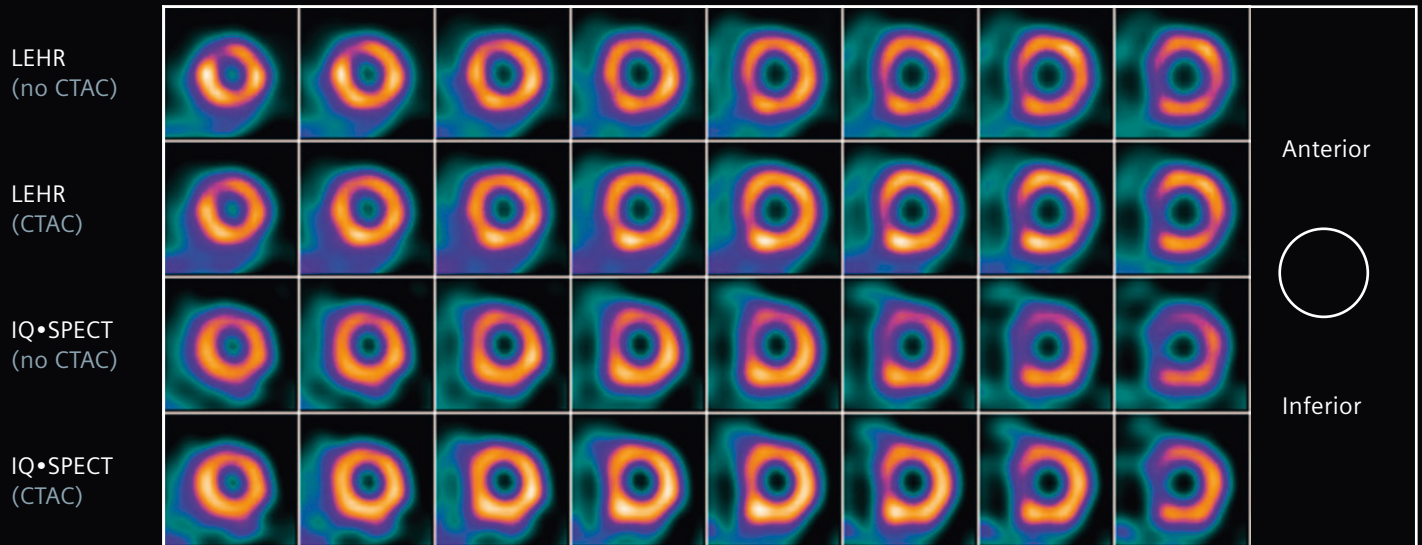


Financial

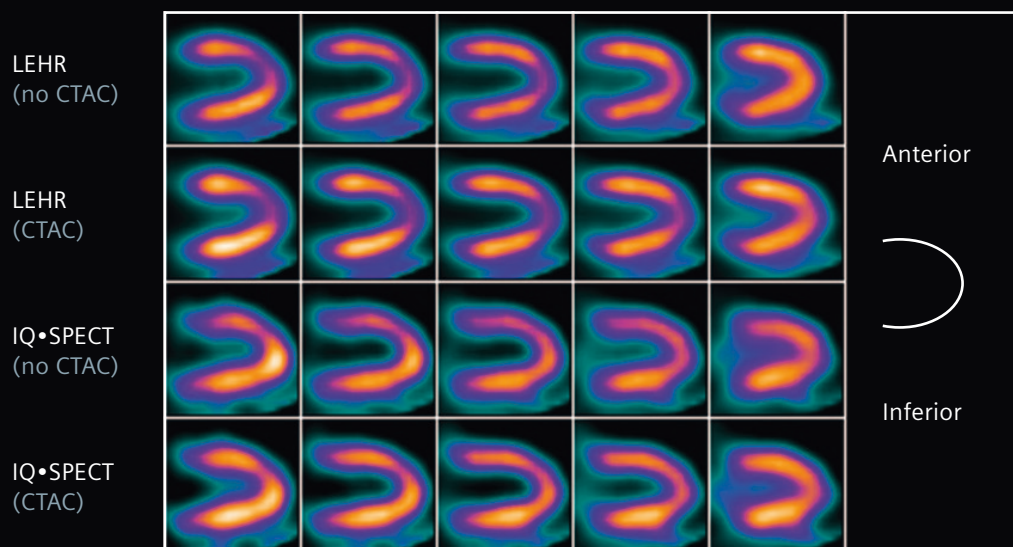
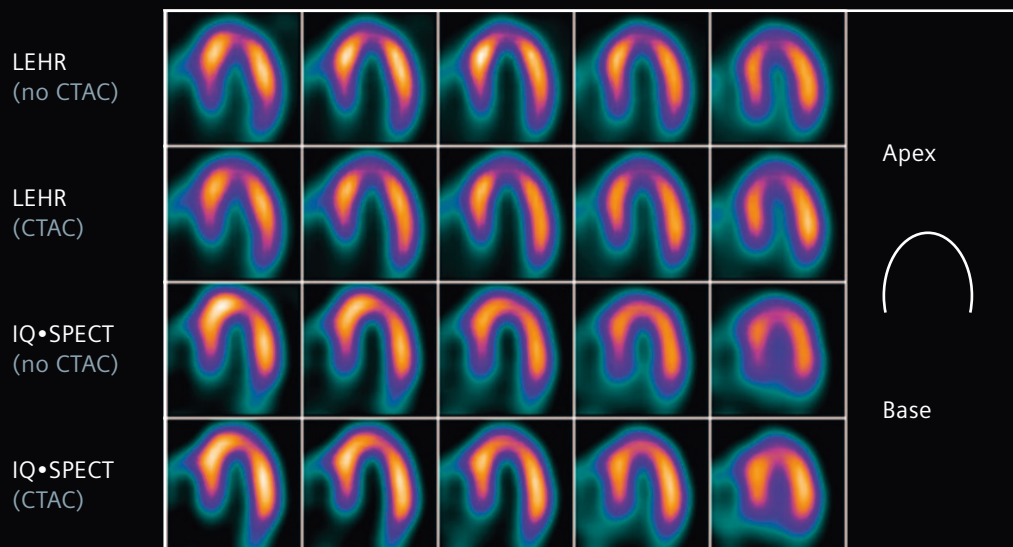
*“Slow scan time limited us to no more than 8 cardiac scans a day. Now, we do up to 15 with IQ•SPECT.”**

Andrea Huffman, Coordinator,
Nuclear Medicine Department

4-Minute Scan Versus Conventional 16-minute Scan



IQ•SPECT images acquired in only 4 minutes versus 16 minutes with LEHR. Post-CTAC IQ•SPECT images show correction of anterior wall attenuation effects.



^{99m}Tc MIBI Stress MPI in a 59-year-old female patient shows normal perfusion at peak stress. LEHR (16 minutes) and IQ•SPECT (4 minutes) images show comparable image quality and tracer distribution.

Data courtesy of University of Michigan, Ann Arbor, Michigan, USA