Minimum Dose is **What I need** is Maximum Speed.

**Minimum Dose. Maximum Speed.**

*With Symbia® SPECT•CT*

www.siemens.com/mi
Two of the most challenging issues facing healthcare today are the dual mandates to improve patient safety and increase productivity. From a patient care and economic perspective, each is critically important.

Siemens innovative philosophy is based solidly upon the assumption that achieving the highest technical performance is only important when it meets the needs of the patient and our customers. From the very beginning, one of the most frequent demands of our end users has been patient safety. In molecular imaging, patient safety translates primarily into dose reduction.

Principles such as “As Low as Reasonably Achievable” (ALARA) have developed as a guideline to reduce all radiation exposure to the lowest possible level. With CARE (Combined Applications to Reduce Exposure), Siemens has been highly successful in integrating many innovations into the Siemens scanners that significantly reduce radiation dose in comparison to other systems available on the market.

Today, public concerns over radiation are rising, and there is general agreement that unnecessary radiation must be avoided. Because molecular imaging is one of the fastest growing imaging tests, it is more important than ever to administer the lowest dose possible.
Another unique advantage of Siemens CARE is that it helps you run your business more efficiently. Reducing radiation dose translates into a more efficient use of radiopharmaceuticals which has a positive economical outcome.

At the same time, an increasingly competitive and rapidly changing healthcare market requires improvements in quality and throughput. Faster examinations can increase scanner utilization. In addition, quicker scans introduce less patient motion, so image quality and the overall patient experience can be optimized.

**Half the Dose and Double the Speed**

Siemens Molecular Imaging is meeting both of the core needs of improving patient safety and increasing productivity, at the same time, through its commitment: “Minimum Dose. Maximum Speed.” We offer innovative imaging solutions like the Symbia SPECT•CT where the lowest dose can be used while still scanning patients faster than ever before. By reducing dose and increasing speed, costs are dramatically reduced, while increased utilization can also be achieved. Who says you can’t have it all?
Half the Dose and Double the Speed

Symbia Key Technologies

IQ•SPECT

Features

Collimation: SMARTZOOM collimators center on the heart, collecting up to four times more counts than parallel hole collimators. These collimators magnify the heart while still capturing counts from the entire body, so truncation is virtually eliminated.

Acquisition: IQ•SPECT’s cardio-centric orbit is centered on the heart instead of the gantry’s mechanical center. This ensures that the heart is always in the SMARTZOOM collimators’ magnification area.

Reconstruction: The Flash-based 3D iterative reconstruction algorithm models 48,000 collimator holes for virtually artifact-free image reconstruction.

Benefit

• Reduce injected dose by more than 50% or
• Perform scans in ½ time and with ½ the dose
• Improve image quality for better diagnostic outcomes
• Reduce injected dose by more than 50% for higher patient safety or
• Reduce imaging time by up to 75% for increased throughput

HD Detectors
• Up to 26% higher SPECT sensitivity
• Faster images acquisition

Flash
• 2x lower dose
• 2x scan speed

Quality Control
• Lower dose exposure
• Up to 20 hours saved per month
Diagnostic Spiral CT

Features
The CT component on the Symbia SPECT•CT is an ultrafast, multislice spiral CT. The combination of diagnostic CT with SPECT helps save dose with scan speeds up to 28 times faster than the competition.

It provides outstanding lesion localization, helps improve surgical planning and can accommodate advanced applications such as calcium scoring for cardiac risk assessment.

Benefit
• Provides diagnostic CT image with superb anatomical localization
• Can be operated as a stand-alone CT
• Scans up to 28 times faster than non-diagnostic CT and can reduce CT dose
• Can accommodate future applications such as radiation dosimetry for radionuclide therapy, infection imaging and improved therapy planning
• One operator interface for both SPECT and CT components for efficient workflow

"Results may vary. Data on file."
PATIENT HISTORY
A 68-year-old male patient with hypercholesterolemia and occasional chest pain underwent $^{99m}$Tc-Sestamibi myocardial perfusion imaging to evaluate for inducible ischemia. A standard LEHR SPECT study, followed by IQ•SPECT, was performed following treadmill stress testing. Integrated CT calcium scoring was performed, including attenuation correction.

CLINICAL FINDINGS
Both the LEHR and IQ•SPECT studies demonstrated normal perfusion throughout the left ventricular myocardium at peak stress. CT calcium scoring showed high levels of calcification in all coronary arteries. The patient was put on aggressive medical therapy. Note the image quality with 4-minute IQ•SPECT reconstructions compared to the LEHR study with more than 4-times longer acquisition.

STUDY PROTOCOL
IQ•SPECT stress study: 17 frames, 9 seconds/frame (Total: 4 min)
LEHR rest study: 32 frames, 32 seconds/frame (Total: 18.3 min)

Data courtesy of the University of Michigan, Ann Arbor, Michigan, USA
PATIENT HISTORY
Patient with operated lung cancer presented with persistent back pain. A $^{99m}$Tc-MDP bone SPECT•CT study was performed for the evaluation of skeletal metastases. Diagnostic whole-body CT was performed followed by a whole-body SPECT study in 3 bed positions.

CLINICAL FINDINGS
Focal areas of increased tracer uptake in the right proximal clavicle, manubrium sterni, T5 and T7 vertebrae, left ileum, left pubis and right ischium are suggestive of skeletal metastases. Integrated whole-body CT shows sclerotic changes in the vertebral and pelvic lesions.

STUDY PROTOCOL
Whole-body SPECT: 30 mCi $^{99m}$Tc-MDP, 3 bed positions, 90 frames, 5 seconds per frame, 128x128 matrix CT: 130 kV, eff. mAs: 396, Slice collimation: 6x 2.5 mm, Slice thickness: 3 mm, 50% overlap.
PATIENT HISTORY
A breast carcinoma patient referred for ⁹⁹mTc-DPD* bone scan. A planar whole-body bone scan was performed with conventional acquisition protocol and with double the scanning speed with onco•flash reconstruction. Note the well-maintained image quality of the planar bone scan acquired for half the time but processed with onco•flash as compared to the standard study.

STUDY PROTOCOL
746 MBq (20.2 mCi)
⁹⁹mTc-DPD, 180-minute uptake
PATIENT HISTORY
A 74-year-old male patient with hypertension and occasional chest pain underwent $^{99m}$Tc-Sestamibi myocardial perfusion imaging. Standard LEHR and IQ•SPECT studies were performed following a treadmill stress and at rest.

CLINICAL FINDINGS
Both IQ•SPECT and LEHR studies show normal distribution of the tracer throughout the LV myocardium both during stress and at rest. Note the comparable image quality, uptake pattern and left ventricular dimensions in the 4-minute IQ•SPECT study performed with a low injected dose of 5 mCi at rest relative to the LEHR study acquired with a much longer acquisition time.

STUDY PROTOCOL
IQ•SPECT stress study: 17 frames, 9 seconds/frame
IQ•SPECT rest study: 17 frames, 9 seconds/frame
LEHR stress study: 16 frames, 33 seconds/frame
LEHR rest study: 16 frames, 33 seconds/frame

Minimum Dose: 5 mCi      |      Maximum Speed: 4 minutes
PATIENT HISTORY
A 68-year-old male patient with risk factors for coronary artery disease underwent 99mTc-Sestamibi myocardial perfusion imaging. Standard LEHR and IQ•SPECT studies were performed following a treadmill stress and at rest.

CLINICAL FINDINGS
Both IQ•SPECT and LEHR studies show normal distribution of the tracer throughout the LV myocardium both during stress and at rest. Note the comparable image quality, uptake pattern and left ventricular dimensions in the 4-minute IQ•SPECT study performed with a low injected dose of 5 mCi at rest relative to the LEHR study acquired with a much longer acquisition time.

STUDY PROTOCOL
- IQ•SPECT stress study: 17 frames, 9 seconds/frame
- IQ•SPECT rest study: 17 frames, 9 seconds/frame
- LEHR stress study: 16 frames, 33 seconds/frame
- LEHR rest study: 16 frames, 33 seconds/frame

Minimum Dose: 5 mCi | Maximum Speed: 4 minutes

Data courtesy of Hopital de Pontoise, Pontoise, France
PATIENT HISTORY
A 66-year-old male patient (77 kg) with a history of myocardial infarction three years ago, treated with stenting, presented with chest pain. Myocardial perfusion imaging was performed following treadmill stress and also at rest. IQ•SPECT studies were performed following the standard LEHR acquisition. The rest studies were performed after two hours. CT attenuation correction (CTAC) was performed on all studies using an integrated free-breathing diagnostic CT.

CLINICAL FINDINGS
The study showed a large inferobasal fixed perfusion defect suggestive of an infarct. The adjacent inferolateral wall showed significant reversible ischemia. The apex as well as the adjacent anteroseptal wall also showed reversible ischemia.

STUDY PROTOCOL
IQ•SPECT stress study: 36 frames, 6 seconds/frame (Total: 4.7 min)
IQ•SPECT rest study: 36 frames, 6 seconds/frame (Total: 4.7 min)
LEHR stress study: 32 frames, 35 seconds/frame (Total: 19 min)
LEHR rest study: 32 frames, 35 seconds/frame (Total: 19 min)
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*99mTc-DPD referenced herein is not currently recognized by the US FDA as being safe and effective, and Siemens does not make any claims regarding its use.

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