GE Healthcare

Revolution GSI

A Better Exam.

Put yourself instantly at the forefront of spectral CT.

Revolution* GSI is a new generation of CT that delivers consistently high-definition imaging, for confident diagnoses across applications. It equips you to take CT beyond classical anatomical assessment to quantitative tissue characterization and advanced functional imaging. And it does all this while minimizing your patients' radiation dose and the need for costly invasive procedures.

The result: a CT system that can help virtually any institution thrive, even in today's cost-constrained healthcare climate.

GSI is the key.

Gemstone* Spectral Imaging (GSI) uses fast kV switching between 140 kV and 80 kV to generate true monochromatic images, single-energy images that:

- Minimize artifacts from metal, calcium, iodine and other highly attenuating materials.
- Deliver quantitative information about chemical composition.
- May enable contrast-dose reduction by generating lower keV images.

Now in its fourth generation, GSI's dose-neutral spectral energy acquisition, fast setup and workflow-enhancing post-processing have already made this capability part of the clinical routine for facilities around the world.

4th

generation GSI

One system helps you do more:

Characterize lesions

Scan more patients

Eliminate costly procedures

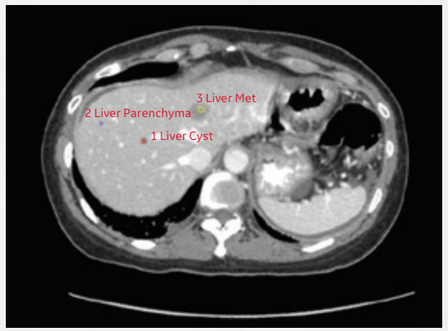
Reduce dose

A new era of CT specificity.

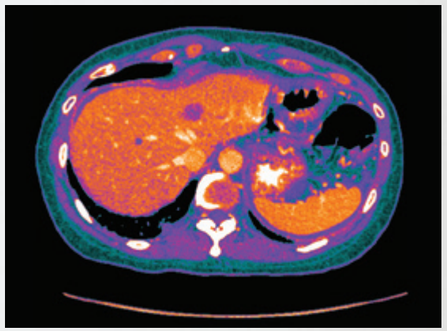
Revolution GSI lets you apply spectral CT routinely to applications from oncology to cardiology, neurology to spine imaging, urology to musculoskeletal studies, and more. That can mean major gains in specificity and diagnostic accuracy.

GSI Lesion Characterization

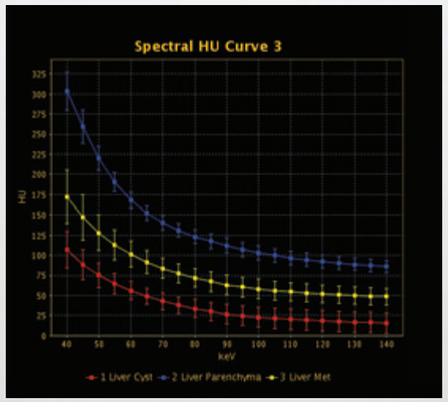
Quantitative characterization at a full 50-cm FOV



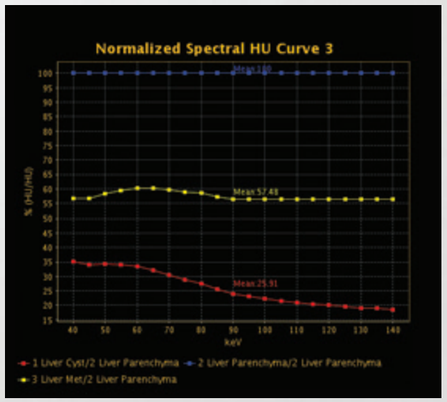
70 keV Spectral



70 keV Spectral color



Spectral Hounsfield unit curve



Normalized Spectral Hounsfield unit curve

Characterizing the inconclusive

Unlike conventional CT, GSI allows images to be viewed at keVs from 40 to 140 for enhanced contrast. That means improved characterization of small and subtly enhancing lesions.

"We're applying GSI not only to detect but also for more accurate staging and characterization of disease. Spectral CT is dependably quantitative, reproducible, validated and easy to apply clinically."

– Dushyant V. Sahani, MD
Director of Computed Tomography
Massachusetts General Hospital

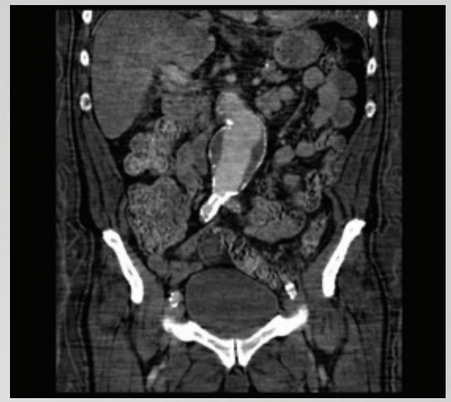
GSI Vascular

Abdominal CTA with only 20 cc of contrast

51 keV

MD Iodine (water)

51 keV



MD Iodine (water)

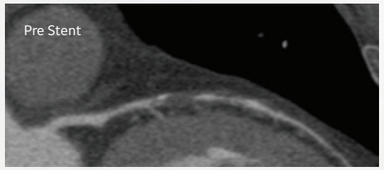
Unleashing detail

GSI lets you view low-keV images with better contrast conspicuity.

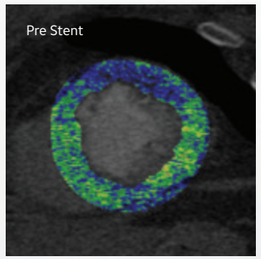
Images courtesy of Dr. Karimi, University of California, San Diego

GSI Cardiac

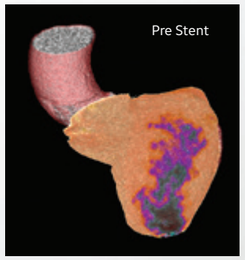
Cardiac perfusion pre-stent versus post-stent CCTA displaying significant reduction of defect for stress perfusion

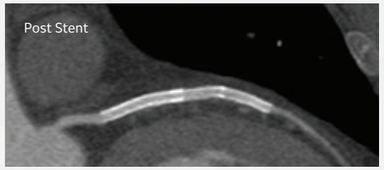


Monochromatic image showing LAD occlusion

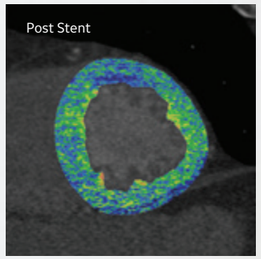


Stress perfusion displaying anterior wall defect



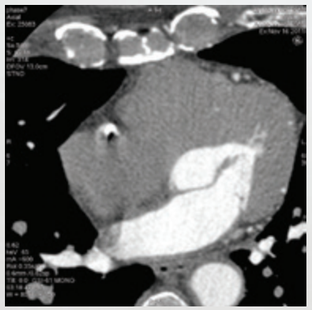


Monochromatic image showing LAD occlusion

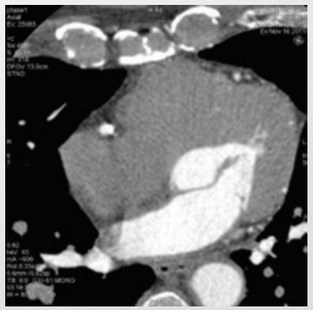


Stress perfusion displaying anterior wall defect

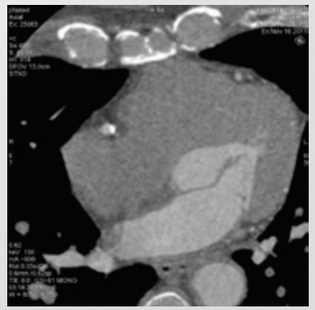
Integrated GSI Cardiac with SnapShot* Freeze



GSI Cardiac 65 keV



GSI Cardiac with SnapShot Freeze @ 65 keV



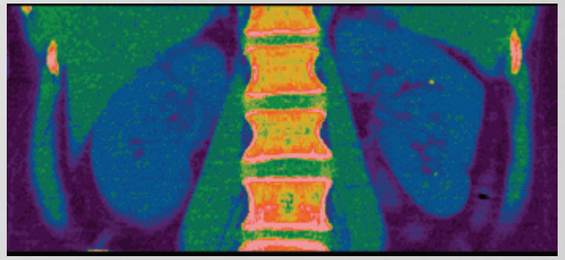
GSI Cardiac with SnapShot Freeze @ 100 keV

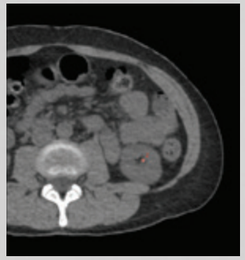
Making the prognosis clear

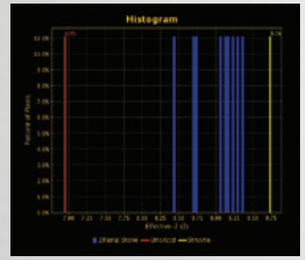
GSI Cardiac allows you to acquire both anatomical and functional information in a single scan. For highly accurate stenosis assessment, with less motion artifact, use it with SnapShot Freeze.

GSI Kidney Stone

Quantitative characterization to enhance diagnosis and therapy







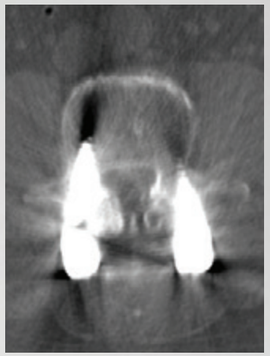
Delivering deeper insights

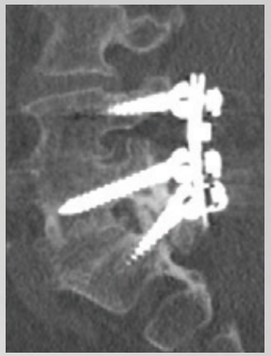
GSI provides quantitative information to help determine the composition of objects such as kidney stones. That means faster triage and initiation of treatment.

Images courtesy of University of Alabama at Birmingham

GSI Metal Artifact Reduction

GSI monochromatic energy to help reduce metal artifacts





Scanning almost anyone

GSI is exceptionally useful for imaging patients with dental or metal implants and for post-operative MSK exams.

Images courtesy of Dr. Pessis, Centre Cardiologique du Nord, Saint-Denis, France

40-140 keV

The technology that makes Revolution GSI possible.

With GSI, both high- and low-energy data sets are collected nearly simultaneously, improving image registration for material separation throughout the full 50-cm field of view.

Enabled by the Gemstone detector, our unique GSI ultra-fast kV switching technology offers you 0.25-msec temporal sampling and near-perfect anatomical registration at the full, 50-cm field of view (FOV) – even at the dose levels of a single standard acquisition.

Rather than relying on image blending, GSI capitalizes on raw data-based processing. And because it uses a single tube and detector to generate monochromatic images, it enables you to achieve highly accurate material decomposition while dramatically reducing artifacts.

Building on a strong foundation.

Revolution GSI capitalizes on the platform established by the proven Discovery* CT750 HD – the pioneering system that equipped the world with:

- Ultra-low-dose ASiR* and Veo* reconstruction.
- The first high-definition, 0.23-mm resolution imaging capability.
- FREEdom Edition** capabilities to address the toughest challenges of cardiac CT.
- The clinical breakthroughs associated with Gemstone Spectral Imaging.

With capabilities such as these, it's no wonder that GSI has become a part of the clinical routine around the world – and has already been the featured technology in more than 100 published papers.

0.25 msec
temporal sampling

50 cm
field of view

Bold new ways to deal with dose.

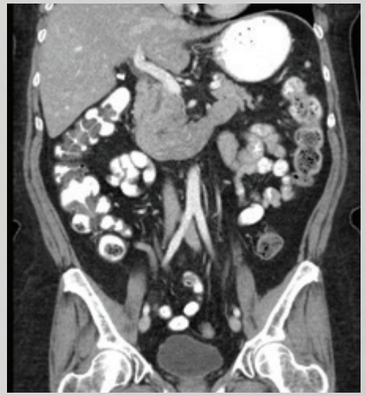
Radiation dose remains a crucial issue for CT. And Revolution GSI helps you address it in two important ways.

First, pace-setting ASiR iterative reconstruction technology enables significant dose reductions. Fully integrated and already proven in more than 60 million studies worldwide, ASiR lets you "dial down" dose without compromising diagnostic detail – and while improving low-contrast detectability and artifact suppression.†

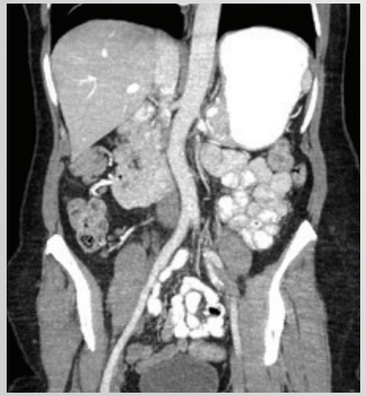
And you can achieve further dose reductions by upgrading to Veo model-based iterative reconstruction. This proprietary capability delivers profound image clarity at doses of under 1 mSv.†

Second, Revolution GSI equips you with capabilities that make GSI dose-neutral compared to standard 120-kV scanning. It starts with our exclusive GSI acquisition technique, and includes Virtual UnEnhanced (VUE) non-contrast-like imaging.

The outcome: optimal image quality at the lowest practical dose, all to benefit your patients.

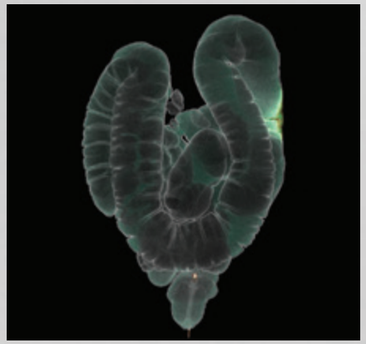


Single energy study | CTDIvol 9.75



GSI study with similar sized patient | CTDIvol 7.22

ASiR chest / abdomen / pelvis | 5.8 mSv



Colon study using Veo | 0.4 mSv

†In clinical practice, the use of ASiR and Veo may reduce CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

An imaging chain that sets new performance standards.

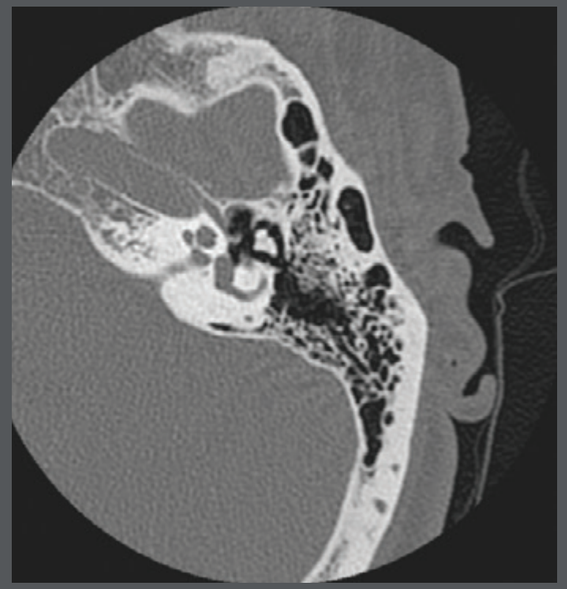
Take a close look at the Revolution GSI imaging chain, and you'll find performance-enhancing innovations from start to finish.

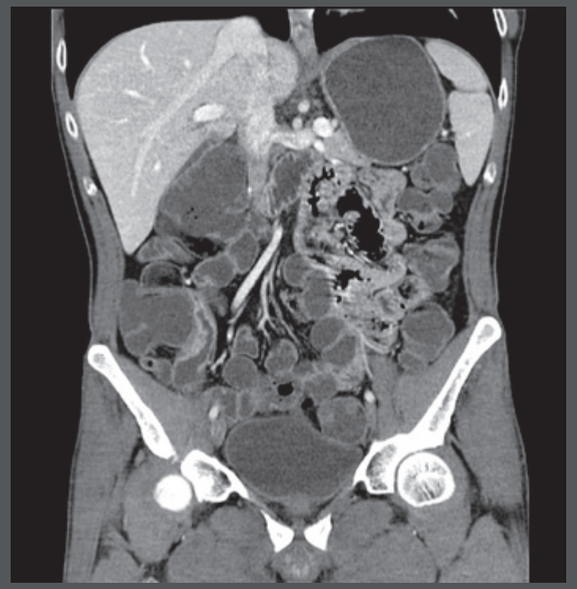
The Gemstone detector, for instance, is the foundation of this system's high-definition capabilities. Its proprietary scintillator material – the first new material in 20 years – employs a garnet structure to enable high-definition imaging during sub-second scanning, even with fast kV switching.

The Volara* Data Acquisition System (DAS) makes additional contributions to this performance – most notably, significant reductions in electronic noise to improve image quality in both high- and low-signal anatomies.

The Performix* HD Tube also contributes, providing greater detail study after study, thanks to features like dynamic focal-spot control.

Revolution GSI technologies are game-changers for CT image quality. For instance, the Gemstone detector delivers dramatic improvements in low-contrast detectability. And the Volara DAS produces significant improvement in spatial resolution across the entire field of view.





The Performix HD tube enables ultra-fast kVp switching, and maximum mAs of 570 and 835 on the small and large focal spots, respectively.

The Volara DAS gathers 2.5 times more views than previous generations – approximately 2,496 views per rotation – to improve both x- and y-axis resolution. It also suppresses artifacts and boosts spatial resolution throughout the field of view.

The Gemstone detector employs a scintillator material whose primary speed is 100 times faster than its competitors; its recovery time, four times faster. This means improvements of up to 40% in low-contrast detectability plus access to new, non-invasive diagnostic capabilities.

2496
views per rotation

Revolution GSI

Suddenly, cardiac CT is routine.

When it comes to advanced applications, Revolution GSI offers you so much more – including tools to make cardiac CT part of your daily routine.

That's because it overcomes the obstacles that have limited the utility of conventional CT for this application – including coronary motion, calcium blooming, high heart rates, and difficult plaque characterization.

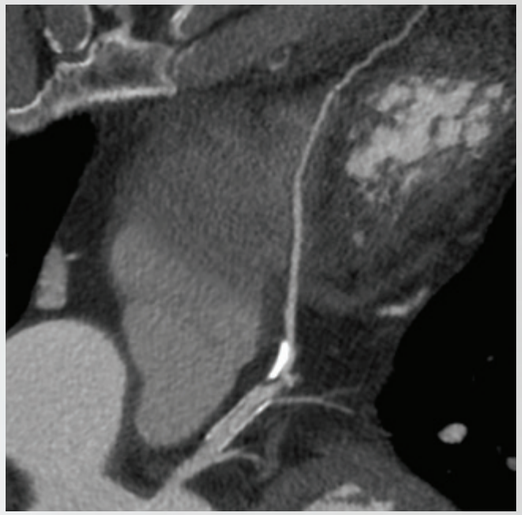
Equally important, Revolution GSI arms you with excellent cardiac CT imaging performance – including spatial resolution of 18.2 lp/cm for accurate quantification of stenosis in coronary vessels.

The result: cardiac CT capabilities that your patients and their physicians can rely on.

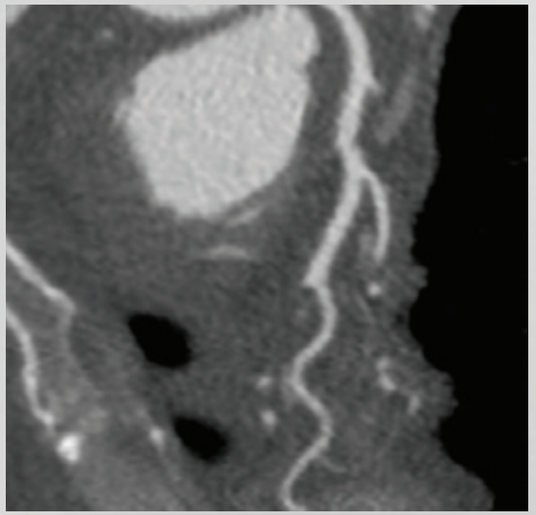
29 msec temporal resolution†

† The reduction in motion artifact is comparable to a 0.058 sec equivalent gantry rotation speed with effective temporal resolution of 29 msec, as demonstrated in mathematical phantom testing.

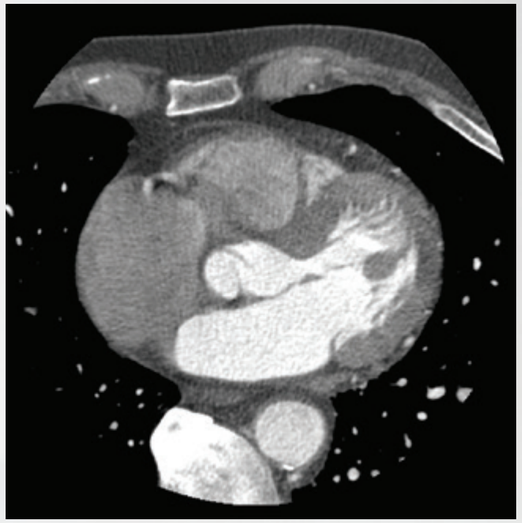
With its advanced capabilities, Revolution GSI can often provide all the information a clinician needs for confident diagnoses without additional exams – even in the presence of conditions, such as high heart rates, that challenge conventional CT equipment.



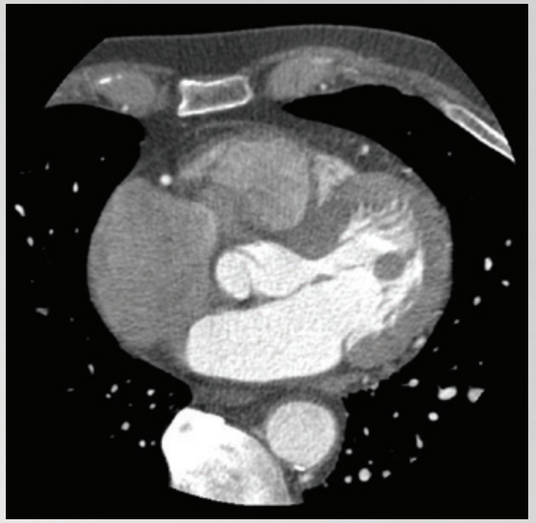
High definition cardiac



Low dose | 0.65 mSv



Conventional CT



With SnapShot Freeze

Simply smart, from every point of view.

Smart Technologies is an innovative suite of intelligent tools designed to improve efficiency and expand applications, all while delivering diagnostic confidence at lower radiation dose.

SMART SPECTRAL lets you make spectral imaging routine by streamlining setup of these advanced procedures. It provides GSI Assist to support the acquisition in tailoring protocols to each patient and indication. And it improves visualization of the acquired spectral information via the GSI Viewer 3D, which leverages post-processing capabilities from volume rendering to segmentation and vessel analysis directly embedded into the software program.

SMART CARDIAC allows you to prescribe even complex cardiac procedures quickly, reliably and repeatedly. It includes tools such as SnapShot Freeze and SnapShot Pulse to reduce coronary motion and lower dose, as well as SnapShot Assist to support the acquisition for consistently successful cardiac acquisitions.

SMART DOSE helps you acquire high-quality images using lower doses of radiation. Standard capabilities include:

- kV Assist, which provides automated, Scout-based kV, mA, and WW/WL recommendations, with each protocol tailored to patient, anatomy and clinical indication.
- Higher Helical Pitch, enabling a pitch of 1.531 to produce image quality comparable to a 1.375:1 pitch at a lower dose.
- Organ Dose Modulation, which automatically reduces dose for superficial tissues such as the eyes and anterior chest, creating a virtual shield for sensitive anatomy.

SMART FLOW helps you streamline workflow and access to information. With capabilities such as default patient positioning, Image Check and the Xtream Display, you can see your productivity improve by up to 40% while the patient is on the table.†

Revolution GSI puts personalized care and smart workflow within easy reach. Among the tools accessible at the gantry are one-stop scanning mode, default patient positioning, and ECG waveform on the Xtream Display, which can also be personalized with the patient's name and used to play distraction videos.

Up to **40%** improved productivity

† Actual results may vary depending on the circumstances, including but not limited to exam type, clinical practice, and image reconstruction technique. This information was based on a simulation using the GE Healthcare Optima* CT660 device and is presented for illustrative purposes only.

Smarter for the bottom line.

The diagnostic confidence provided by Revolution GSI may also contribute to your facility's bottom line – helping to reduce overall costs, build your referral base, boost patient volume and enhance the efficiency of managing challenging patients.

Consider, for instance, this system's ability to serve as a gatekeeper to more expensive and invasive procedures, and its potential for improving patient outcomes and reducing length of stay.

Or consider Revolution GSI's inherent cost-efficiency. Its unique one-tube, one-generator architecture minimizes downtime and makes both siting and maintenance surprisingly affordable – an important economic consideration.

Finally, Revolution GSI is supported by a full range of flexible financing and service packages to meet your needs precisely.

A better exam with Revolution GSI.

With a powerful combination of improved specificity, lower dose and Smart Technologies, Revolution GSI can help you see, know and do more everyday. Please contact your GE representative or visit www.gehealthcare.com

www.gehealthcare.com

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter – great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

Imagination at work

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