Revolution™ CT ES

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Overcome your scanning challenges

Your goal: to increase access to healthcare, improve quality, and reduce costs. And above all, to enable patient safety and clinical and operational outcomes.

Your commitment: to be as accurate as possible to provide the most precise diagnoses and the best patient care.

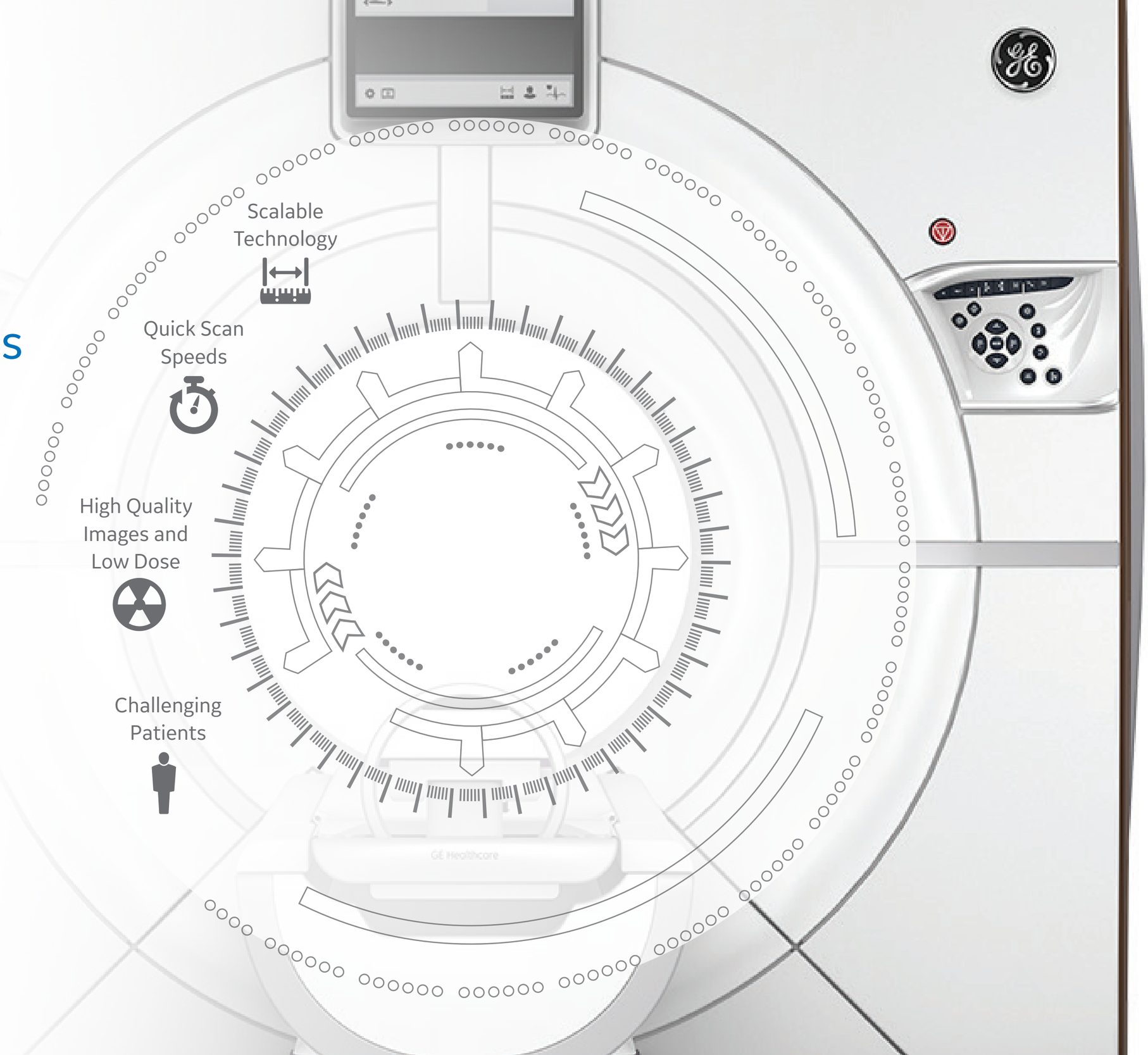
Your mission: to achieve high-quality images—especially for challenging patient populations—while balancing speed, dose, and effectiveness.

But you're faced with obstacles that can derail even the truest ambitions:

- Examining trauma patients, children and patients in critical condition who have trouble remaining still or holding their breath can result in failed scans or low quality images.
- Balancing the trade offs between image quality, patient dose and time to scan.
- Investing in equipment that is cost-effective and appropriate for practice needs today and is scalable to meet future expectations.

How can you overcome these obstacles that are keeping you from your goals, commitments, and mission?

The Revolution CT ES is a system designed to meet your needs, combining innovative technologies and features to overcome challenging patients and conditions, and scalable solutions to grow with your practice.



Enabling Technologies to exceed expectations

Fast Scans, Exceptional Image Quality, More Options

The multipurpose Revolution CT ES offers advanced CT imaging across all specialties and provides versatile clinical solutions through innovative technologies allowing this ultra-premium CT scanner to meet the needs of your most challenging patients, every day.

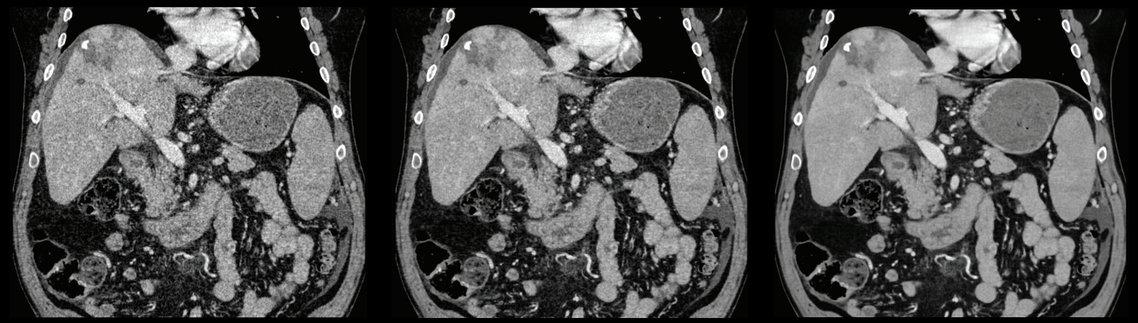
TrueFidelity™ Images

How the Best See Better

Image quality is the key to accurate diagnosis. TrueFidelity, one of the first deep learning based image reconstruction[2] engines on the market, combines the ground truth image quality of "high-fidelity" filtered back projection with the low-dose capabilities of iterative reconstruction to generate images with outstanding spatial resolution, low-contrast detectability, and natural-looking image texture.

TrueFidelity images have the potential to improve reading confidence in a wide range of clinical applications—such as head, whole body, and cardiovascular—for patients of all ages. Because TrueFidelity runs on a cutting-edge reconstruction server, it has the power to achieve fast reconstruction for routine CT use, even in acute care settings.

TrueFidelity's CT images are more than a radical, next-generation improvement. They elevate the vision of what you and deep learning based image reconstruction[2] can achieve—together.



0.625 mm venous FBP | 0.625 mm venous ASiR-V™ 50 % | 0.625 mm venous TrueFidelity

GSI Xtream

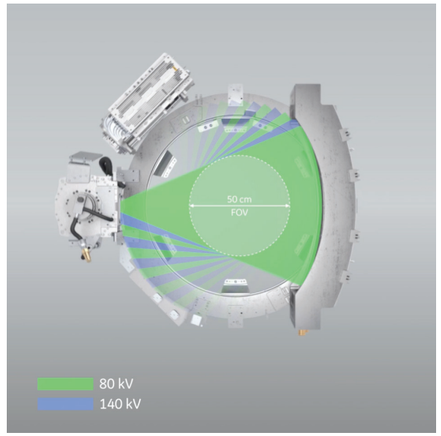
Volume. Spectral. Simplified.

GSI Xtream is the first volume spectral CT technology designed for small lesion detection, tissue characterization, and metal artifact reduction—all with a simplified workflow that's easy to incorporate into your daily practice. With its wide 80 mm GSI collimation and 50 cm field-of-view (FOV), GSI Xtream enables the Revolution CT ES to deliver a volume spectral CT.

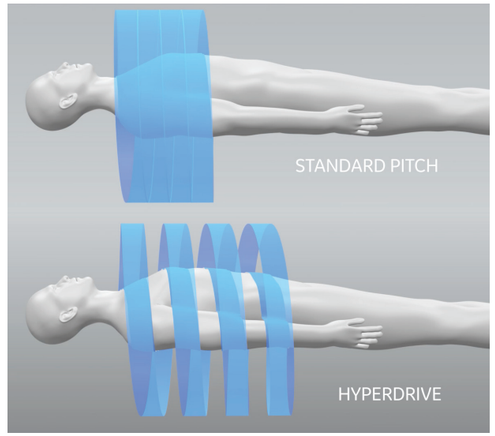
GSI Xtream utilizes an ultra-fast kVp switching x-ray source—0.25 ms switching between two different energy levels of X-rays from view to view during a single rotation—and the fast-response Gemstone™ Clarity Detector to acquire almost perfectly registered volumetric dual-energy CT data.

This data can be used to identify material-specific differences in attenuation in terms of Water, Iodine, Calcium, Uric Acid, Fat and Hydroxyapatite basis-pair images, allowing monochromatic and material representations. Metal Artifact Reduction algorithms can also be applied to all GSI images to reduce artifacts due to the presence of metal. All these images can be sent directly to the PACS for easy reading and interpreting.

GSI Xtream enhances the entire GSI experience—from scanning to reconstruction to visualization—to help you diagnose disease with more confidence.



GSI Xtream



HyperDrive

HyperDrive

Up to the Challenge

Patients who are stressed, afraid, or in pain can have trouble following directions, remaining still when needed, and holding their breath.

Most of these patients require high scan speeds—but some super-fast solutions come with limitations, like compromised FOV and incompatibility with dual energy. These limitations can compromise visibility and clarity—and prevent it from being used for every patient.

Revolution CT ES comes with HyperDrive, the first super-fast scan mode with 50 cm FOV. With high pitch mode and 80 mm detector z-coverage, HyperDrive can provide a maximum acquisition speed of up to 437 mm/s.

HyperDrive can be used for pediatric patients to decrease the need for sedation; for ED trauma patients to reduce motion artifacts; and for asthma or COPD patients to reduce the need for breath hold. By reducing breathing and motion artifacts, HyperDrive brings the benefits of free-breathing and sedation-free CT imaging to a broader range of patients, and makes it one of the most versatile scan modes in the industry.

Future-Proof Your Practice

Ready to Grow When You Are

Access to care enhances patient satisfaction, so when you want to expand access to more challenging patients, your CT's capability should grow along with you.

Ground-Breaking Platform

Revolution CT ES leverages the powerful Revolution CT platform with innovative technologies that deliver a better experience for patients and staff.

The Gemstone™ Clarity Detector offers 80 mm detector coverage, lets you increase the spatial resolution to 0.23 mm, and overcomes the challenges typical of wide-coverage systems: cone beam artifacts, scatter, beam hardening, and HU uniformity.

Integrated ASiR-V™ enables up to 82% dose reduction for all clinical applications, making it ideal for all patients—especially those who require lower doses, such as children, frequent follow-up patients, and women of child-bearing age.[1]

SnapShot™Freeze 2[2] - intelligent motion correction offers 24 ms effective temporal resolution, providing high-definition, motion-free coronary images at any heart rate.

The 80 cm bore size with a full 50 cm FOV not only creates a more comfortable patient experience, but also provides more diagnostic information.

Invest in the Future

Revolution CT ES is designed with versatility and scalability in mind, so you can offer access to more patient populations as your needs increase. Built on the Revolution CT platform, the Revolution CT ES can be customized to your needs by expanding detector coverage from 80 mm to 160 mm. What better protection for your investment?

With Revolution CT ES you're investing in not just now, but in the future of your practice.

The Next Level of Care

Solutions for the Toughest Clinical Care Areas

Every patient population presents its own challenges. Revolution CT ES is ready to help you offer the best care for every patient, thanks to its innovative technologies.

Emergency Care

Emergency department patients may be injured, traumatized, or in distress—so the ability to obtain fast scans and high-quality images is crucial. Be prepared for the unexpected with Revolution CT ES. Its suite of technologies and features offer the radiologist faster scans, high image quality, and a full FOV.

At the same time, the 2 m table and 80 cm bore size of Revolution CT ES help you work with patients who are difficult to position properly, and offer patients a higher level of comfort.

Situation

Time is life for ER patients. But they may have difficulty remaining still, following instructions, or holding their breath, resulting in motion artifacts that decrease diagnosis confidence—or even result in failed scans.

HyperDrive boasts a 50 cm FOV, plus a super-fast scans of up to 437 mm/s with both single and dual energy modes, for motion-free CT imaging and fast, comprehensive data.

Situation

Patients may have metal implants, plates, screws, rods, or fillings, which create metal artifacts in the image.

Smart MAR (Metal Artifact Reduction), based on the latest in GE Healthcare Smart technology, uses an automated, three-stage, projection-based process to help improve the quality of CT data within the projection space, rather than in image space. This innovative method helps reduce photon starvation, beam hardening, and streak artifacts caused by metal in the body, and is compatible with all types of GSI images.

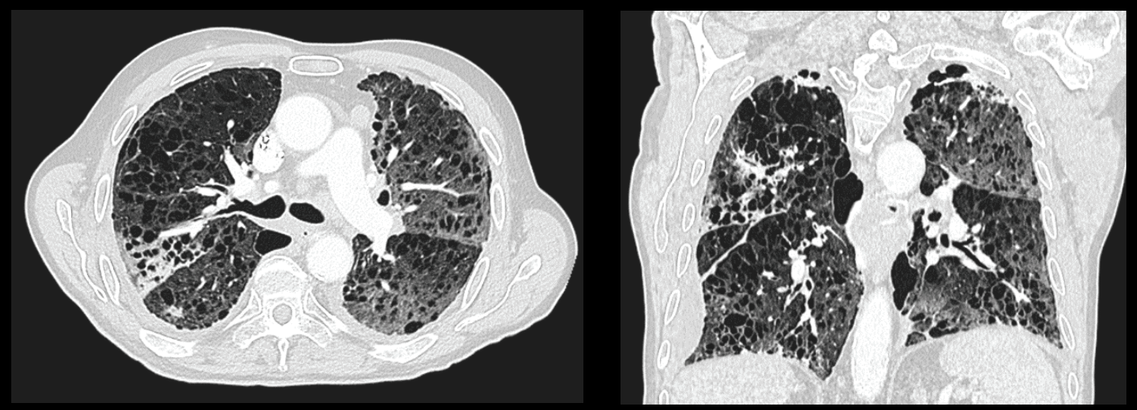
Situation

When it comes to injured or traumatized patients, each step of the care process needs to happen fast.

Smart Trauma is a comprehensive suite of dedicated trauma tools for patient setup, scanning, and image review. These tools help you improve the quality and workflow of poly-trauma and whole-body CT scans through dedicated trauma protocols, prioritized workflow, and minimal breath holds.

Clinical ID helps standardize and automate protocol selection with images directly transferred to PACS or AW. This helps deliver spectral CT workflow that's twice as fast.

HyperDrive free-breathing chest CT for an ER patient with emphysema and pulmonary fibrosis



TrueFidelity motion-free images to reveal emphysema and pulmonary fibrosis.

Oncology

Revolution CT ES and its suite of new technologies offers radiologists the information they need—and an easier way to read, review, and interpret that information for greater diagnostic confidence for the most common procedure in the department, oncology follow up.

Situation

Tumors can be complex, and radiologists need as much information as possible to diagnose and handle difficult cases.

GSI Xtream is the first volume spectral CT technology designed to improve small lesion detection, tissue characterization, and metal artifact reduction—all with a simplified workflow.

Situation

Even when radiologists have the information they need, they still lack an easy, streamlined way to read, interpret, and review the data.

GSI Xtream Workflow can directly generate GSI images on console and transfer to PACS for review. This minimizes reliance on post-processing workstations—and makes GSI a mainstream CT tool to help every radiologist provide precise and insightful diagnosis for personalized treatment.

Situation

Poor image quality makes it difficult for radiologists to see detail, texture, and margin—and make a confident diagnosis.

TrueFidelity Images are scanning taken to another level—even compared with the most sophisticated Model-Based Iterative Reconstruction.

Contrast visualization is maintained; noise and artifacts are minimized; and edges are maintained—just enough—so there's remarkable clarity, and none of the compromise that comes with unfamiliar noise texture.

The result is an easy, information-rich interpretation experience that gives radiologists the confidence they need, even as it potentially improves scan read times and fights radiologist fatigue.

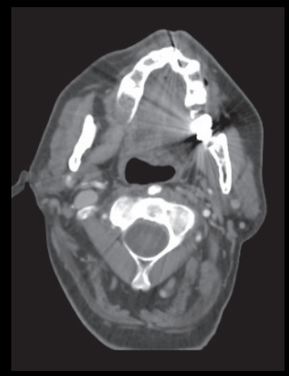
Situation

Patients imaged with CT often have metal implants that can cause artifacts due to photon starvation, beam hardening, and scatter.

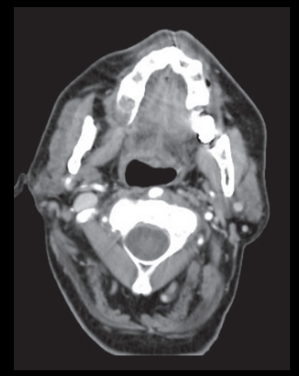
GSI MAR (Metal Artifact Reduction) is a metal artifact reduction algorithm designed to reveal anatomic details obscured by metal artifacts.

GSI MAR reduces metal artifacts using a three-stage correction to address photon starvation, beam hardening, and scatter. This approach generates metal-corrected images, while preserving spatial resolution and data integrity near the metal.

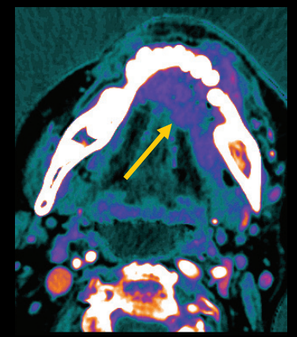
GSI MAR to reduce artifacts caused by metal denture and reveal enhanced mouth floor carcinoma lesions



60 keV without GSI MAR



60 keV with GSI MAR



Iodine color map with GSI MAR to remove metal artifacts and reveal enhanced mouth floor carcinoma (arrow)

Stroke Imaging

For stroke patients, time is brain. When a patient arrives at the emergency room with symptoms that suggest stroke, CT is the first-line imaging test to make a quick and accurate diagnosis that enables immediate treatment. Revolution CT ES reduces time to diagnosis for your stroke patients, saving time—and brain tissue.

Situation

For stroke patients, time is critical. This always requires CT to provide a fast, standard and comprehensive stroke workflow to support immediate and accurate treatment decision.

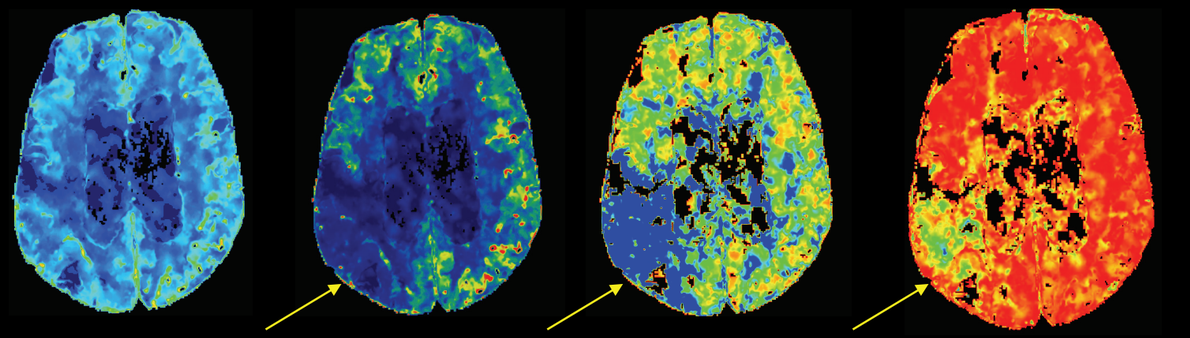
FastStroke provides a fast and efficient review of CT images for ischemic stroke evaluation. It is a comprehensive workflow solution for reviewing all CT series acquired for acute stroke workup with exceptional flexibility and simplicity. It is designed to intelligently adapt to your department practices allowing you to post-process and review CT stroke images effortlessly.

Situation

Significant intra-arterial hemorrhage tends to occur relatively early after ischemia stroke's intraarterial reperfusion therapy, at a period when iodine contrast can stain the brain parenchyma.

GSI Neuro can differentiate contrast agent from hemorrhage in this early period, which has important implications in the decision to continue or initiate antiplatelet or anticoagulation therapy. It also helps improve visualization and characterization of brain lesions.

Dynamic brain perfusion to evaluate the right parietal stroke



Cerebral Blood Volume (CBV) | Cerebral Blood Flow (CBF) | Mean Transit Time (MTT) | Impulse residue function (IRF) T0

Dynamic perfusion maps (CBV, CBF, MTT, IRF T0) to reveal the right parietal stroke (arrows)

MSK

Fractures and dislocations may require surgical interventions, plus follow-ups to determine healing—leading to the need for high-quality diagnostic images at low doses. Revolution CT ES integrates technology that provide ultra-high resolution images.

Situation

Radiologists need to be able to diagnose even the tiniest fractures and breaks.

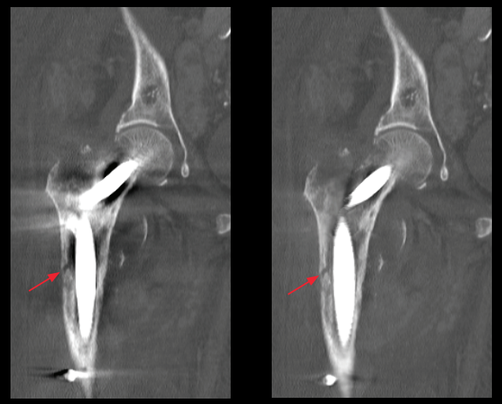
High Resolution imaging captures twice the number of views per rotation to deliver a significant improvement in spatial resolution: 230 microns across the full 50 cm FOV.

Situation

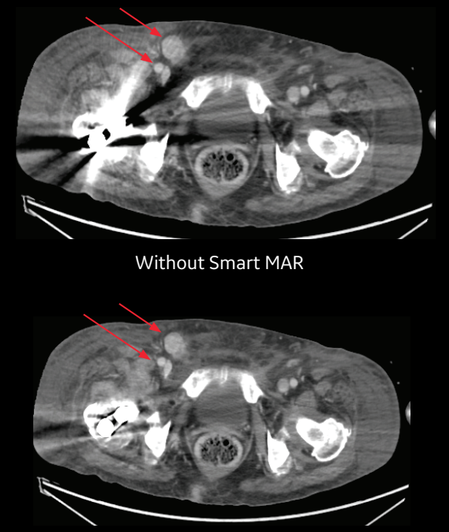
Patients may have metal implants, plates, screws, rods, or fillings, resulting in metal artifacts in the image.

Smart MAR is a single-energy metal artifact reduction solution that uses an automated, three-stage, projection-based process to reveal anatomic details obscured by metal artifacts. It reduces photon starvation, beam hardening, and streak artifacts caused by metal in the body. Smart MAR requires one single kV scan, and can be enabled in secondary reconstructions, making the metal artifact reduction workflow fast and efficient.

Smart MAR to reduce metal artifacts caused by hip replacement and reveal metastatic cancer lesions



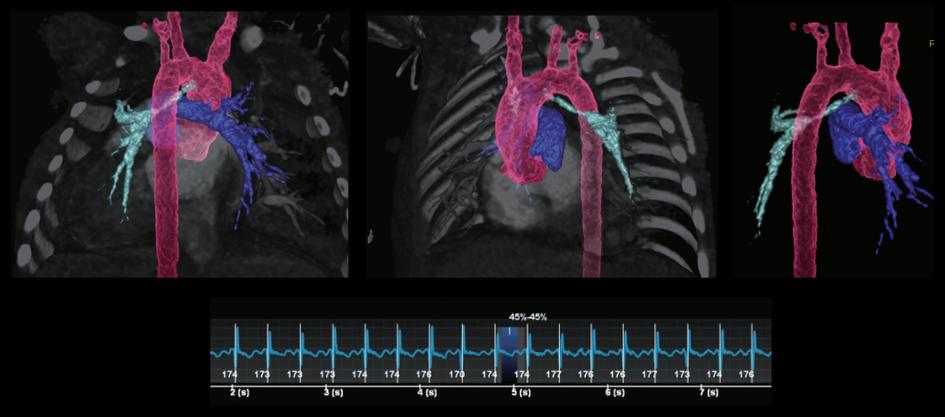
Without Smart MAR | Smart MAR to reduce artifacts and better visualize the bone fracture (arrow)



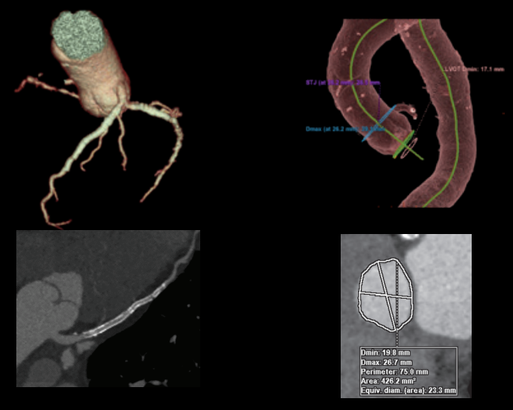
Without Smart MAR

Smart MAR to reduce artifacts and better visualize tumor lesion and adjacent vessels (arrows)

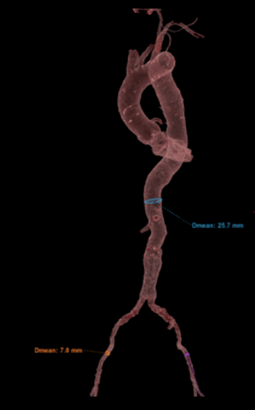
1-beat, sedation-free and 0.3 mSv exam for a three-month pediatric patient with persistent truncus arteriosus and 177 BPM heart rate



Versatile mixed scan mode (gated axial + non-gated helical) to achieve coronary CTA and TAVR planning with one contrast injection



Gated axial with AutoGating to capture coronary CTA & aortic valve



Non-gated helical HyperDrive scan to assess aorta

Pediatrics

Pediatric patients can be challenging: They require fast and accurate images to avoid the need for sedation, and lower dose levels for safer care. Let Revolution CT ES provide lower doses and fast scanning for your youngest patients with its smart workflow solutions.

Situation

Children may have difficulty following breathing instructions, and pediatric sedation can lead to adverse events.

HyperDrive's super-fast scan speed of up to 437 mm/s can provide free-breathing, sedation-free, and ultra-low dose CT experiences for pediatric patients. Whole abdomen and pelvis scanning, for example, can be accomplished in less than one second.

Situation

Pediatric patients are especially dose sensitive, since radiation dose is considered cumulative across a lifetime.

Smart Dose technologies like Automatic Exposure Control, 3D Dose Modulation, and Color Coding for Kids help the radiologist optimize the dose for every patient. These, along with ASiR-V[1], can lead to better dose management for pediatric patients.

Situation

Reported total Congential Heart Diseases birth prevalence increased substantially over time, from 0.6 per 1,000 live births in 1930 to 1934 to 9.1 per 1,000 live births after 1995. Over the last 15 years, stabilization occurred, corresponding to 1.35 million newborns with CHD every year.[3]

SnapShot™ Freeze 2 motion correction technology, with its 80 mm z-coverage, 24 ms[2] temporal resolution, and 0.28 s rotation speed, can freeze the motion of the heart and reveal congenital heart defects.

Situation

The scan environment can increase fear and anxiety in young patients.

Smart Kids design features, like soft ambient lighting and a patient-centric bore pattern, create a calming effect. The Adventure Series option immerses patients in an underwater journey or jungle adventure with themed rooms to help distract them from the procedure.

Cardiac

When you need precise imaging of the heart, rely on Revolution CT ES and its suite of innovative technologies that increase precision, speed and diagnostic confidence.

Situation

Acquiring high-quality images with fine detail is a challenge, which decreases diagnostic confidence.

TrueFidelity and **High Resolution** mode bring the power of deep learning and ultra-high resolution scanning, at standard radiation doses, to everyday CT imaging. This can help produce images of stents and coronary plaque with outstanding detail.

Situation

It's difficult to reliably obtain high-quality images with variable heart rates.

Smart Cardiac technology enables high-definition, motion-free coronary images at any heart rate. It utilizes large detector coverage with 0.28 s rotation speed, AutoGating and Smart Arrhythmia Management, which ensures robust, low-dose, and high-definition cardiac imaging for all heart rates, with or without beta blockers.

A Versatile CT Platform to Overcome Challenges Now and in the Future

Focus on the future with Revolution CT ES. A versatile CT system empowered with a suite of innovative technologies to help address the toughest clinical areas, and handle just about any critical examination. Overcome movement or breathing challenges from trauma or critical patients and children. Obtain high-quality images with low dose quickly. The Revolution CT ES is designed to fit your practice now and provides the scalability to expand with you.

To learn more or see a demonstration, contact your local GE Healthcare sales representative.

GE Healthcare

About GE Healthcare:

GE Healthcare is the $19.8 billion healthcare business of GE (NYSE: GE). As a leading provider of medical imaging, monitoring, biomanufacturing, and cell and gene therapy technologies, GE Healthcare enables precision health in diagnostics, therapeutics, and monitoring through intelligent devices, data analytics, applications, and services. With over 100 years of experience in the healthcare industry and more than 50,000 employees globally, the company helps improve outcomes more efficiently for patients, healthcare providers, researchers, and life sciences companies around the world. Follow us on Facebook, LinkedIn, Twitter and The Pulse for latest news, or visit our website **https://corporate.gehealthcare.com/** for more information.

[1] In clinical practice, the use of ASiR-V 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.

[2] Deep Learning Image Reconstruction, SnapShot Freeze 2 – Whole Heart may not be available for sale in all regions.

[3] Birth Prevalence of Congenital Heart Disease Worldwide: A Systematic Review and Meta-Analysis, JACC vol. 58 no. 21 2241-2247. http://www.onlinejacc.org/content/58/21/2241#

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