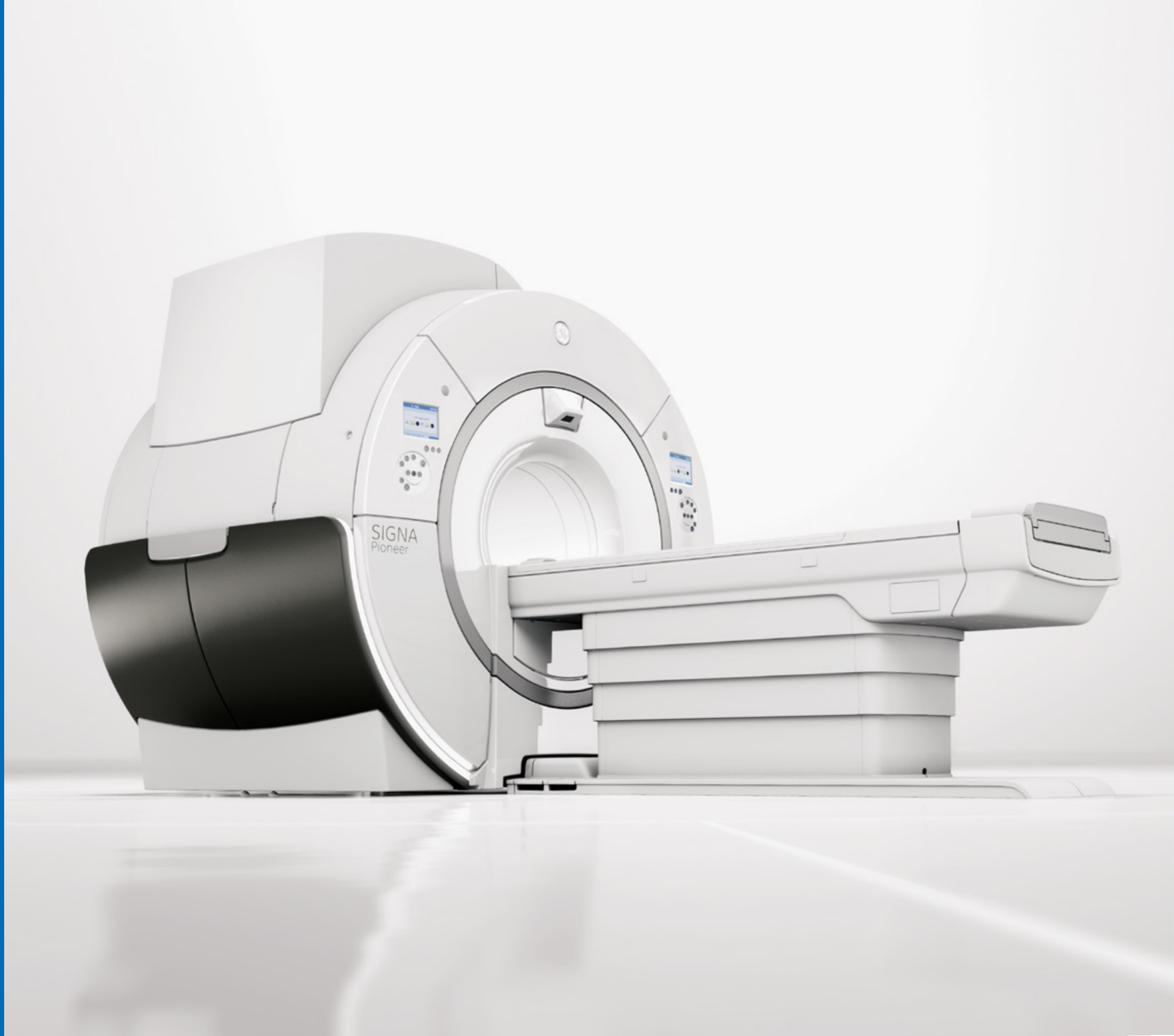
GE Healthcare

Envision

what you've always wished MR could do.

SIGNA™ Pioneer

Fueled by SIGNA™Works


SIGNA
Pioneer

Amaze

See things way beyond your expectations.

Welcome to the SIGNA™ Pioneer, named for the many ways it is exploring and expanding what is possible for MR.

By pioneering technology that creates scans sharper than you thought possible ... for more patients per day than you considered possible ... with more comfort and less anxiety than your patients imagined possible.

This is a story of pioneering what are very clear advances with very clear advantages for MR—the story of the SIGNA™ Pioneer.

SIGNA™ Works
fueling the future of MR

SIGNA™Works

The new standard is extraordinary

Our new SIGNA™Works platform redefines productivity across the breadth of our core imaging techniques with solutions. The SIGNA™Works standard applications portfolio is an extensive set of high quality and efficient imaging capabilities that enables you to achieve desired outcomes across your entire practice area.

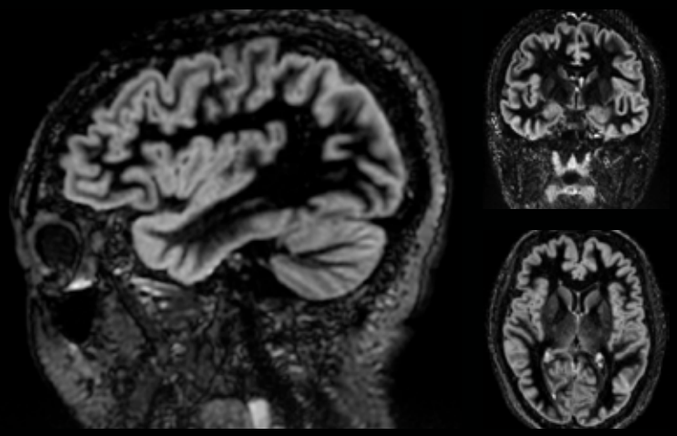
SIGNA™Works is the lifeblood, the soul and the muscle - literally the fuel that drives your imaging to the next level and beyond. SIGNA™Works standard applications come pre-loaded with the SIGNA™ Pioneer as a fully integrated solution. It's value-added technology that's upgradeable and can be customized further, giving you the flexibility to add applications to suit the needs of your growing practice.

SIGNA™Works takes full advantage of TDI (Total Digital Imaging), further advancing diagnostics and quickening throughput, while simultaneously improving patient outcomes and your ROI.

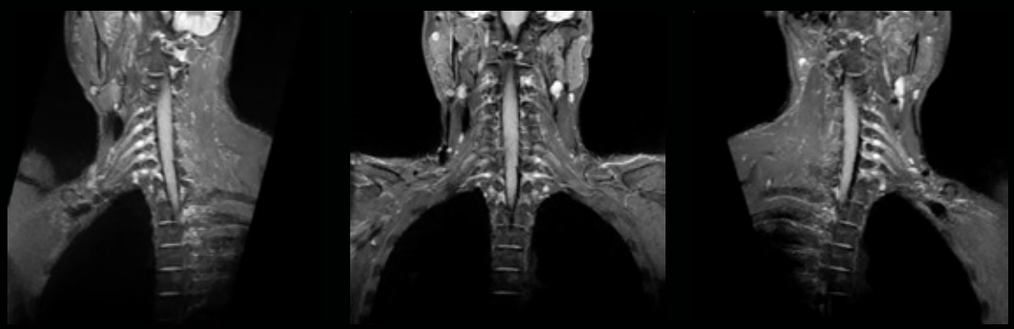
Energize

Phenomenal exams to meet your clinical needs

The SIGNA™Works applications portfolio contains NeuroWorks, OrthoWorks, BodyWorks, OncoWorks, CVWorks and PaedWorks. These imaging solutions cover a wide variety of contrasts, 2D and 3D volumetric data, including motion correction capabilities. SIGNA™Works provides all the tools you need to complete a clinical exam.



Cube DIR
1.4 x 1.4 x 1.4mm



Cube DIR

NeuroWorks

This one-stop solution enables you to image brain, spine, vascular and peripheral nerve anatomy with exceptional tissue contrast. These motion-insensitive techniques feature single-click auto alignment, providing the complete neuro solution from scanning to post processing.

NeuroWorks also includes Cube, our 3D volumetric imaging suite, standard with every system. This application allows you to suppress CSF and either white or gray matter to increase lesion conspicuity.

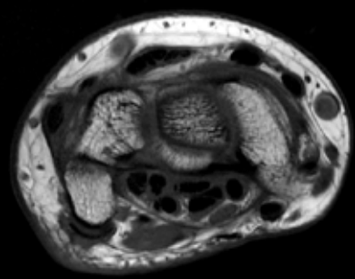
PROPELLER MB, our latest PROPELLER enhancement, is a multi-shot approach that preserves tissue contrast regardless of weighting while also reducing motion artifacts. Additionally, this new technique introduces new contrasts such as T1 FSE.

OrthoWorks

This extensive library of musculoskeletal imaging techniques enables you to image bone, joint and soft tissue with remarkable tissue contrast.

OrthoWorks also includes 3D volumetric Cube with proton-density, combined with ASPIR, which enables improved fat suppression uniformity, which is routinely done as three separate 2D scans. With one 3D acquisition and multi-planar reformats, Cube may replace individual 2D scans.

PD FatSat PROPELLER Coronal

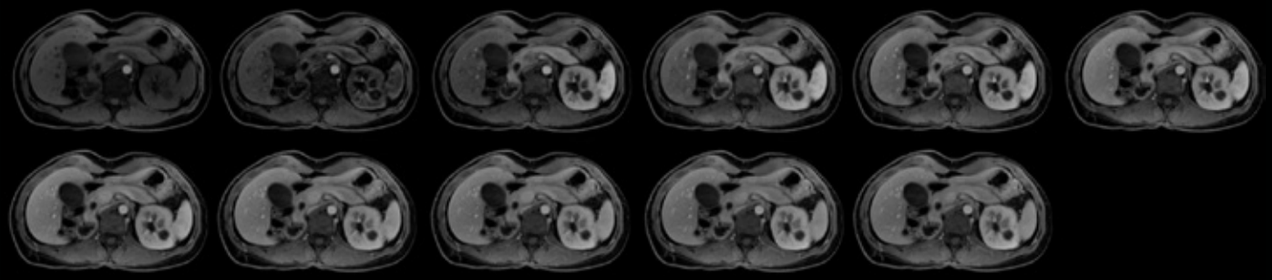


T1 Axial
.2 x .25 x 2.5mm

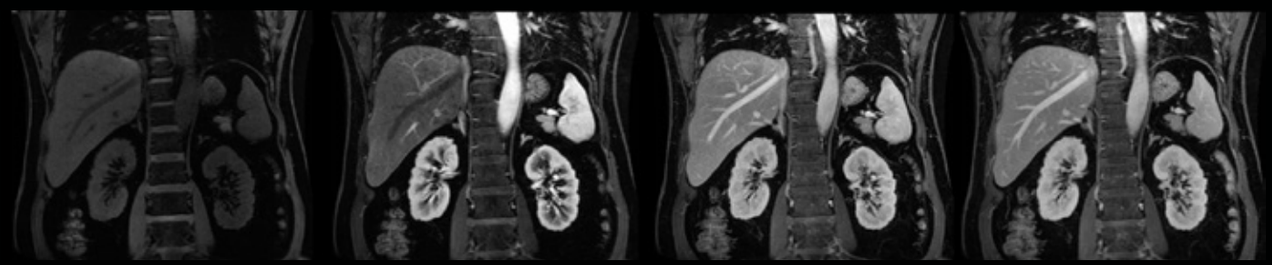
BodyWorks

With BodyWorks, we address one of the fastest growing areas in MR. This all-inclusive library allows you to image abdominal and pelvic anatomy with user flexibility to adapt to different patient types.

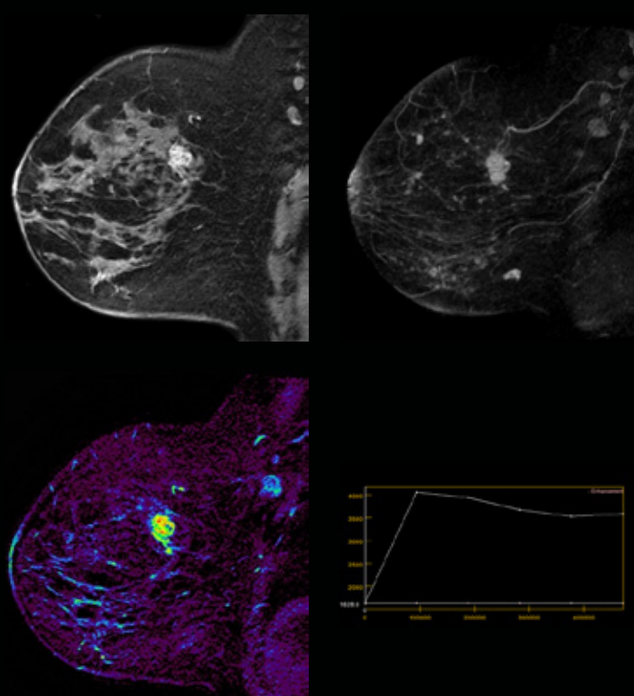
PB Navigators are GE's solution to combat respiratory motion in abdominal imaging. This free-breathing approach is compatible with multiple pulse sequences including diffusion, PROPELLER MB, MRCP and dynamic T1 imaging.



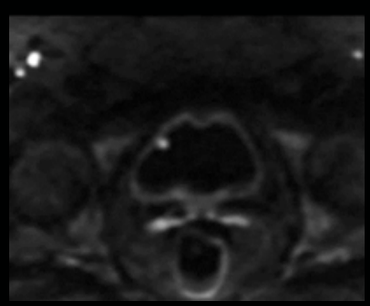
DISCO LAVA Dynamic Liver Free-breathing



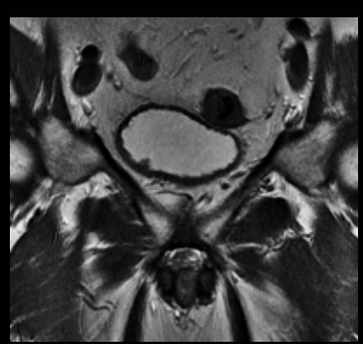
Turbo LAVA Coronal Dynamic Liver
2.4mm



VIBRANT Sagittal



eDWI Axial b1500



T2 PROPELLER

OncoWorks

This extensive library of techniques captures anatomic and morphologic data to uniquely enable oncological assessment of the anatomy. OncoWorks includes robust tissue contrast, motion-insensitive, high temporal and spatial resolution imaging.

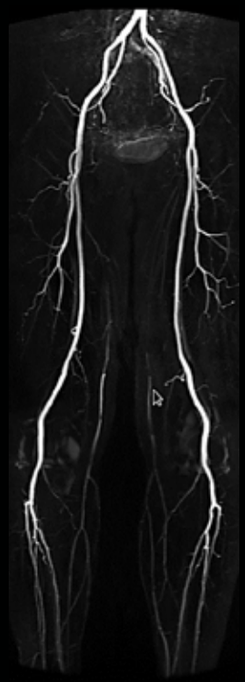
3D volumetric imaging with an optimized adiabatic fat suppression, combined with ARC or ASSET, provides high spatial and temporal resolution capture contrast uptake patterns. The images on the left show lesion characteristics generated using AW VS7's positive enhancement map. The T2 PROPELLER image demonstrates small FOV and motion-correction through the prostate.

CVWorks

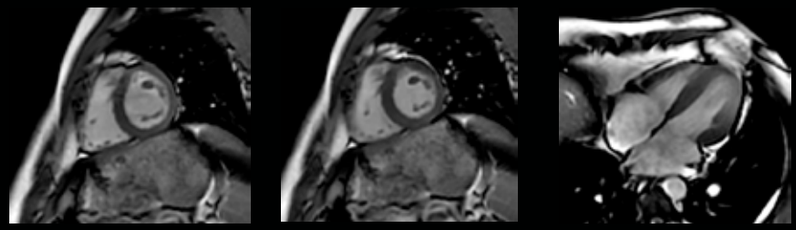
With our intuitive cardiac techniques, you can assess morphology, flow, function and tissue viability plus gain crucial insights into vascular structure and flow dynamics. CVWorks provides the flexibility to adapt to different patient types with exams that vastly simplify workflow.

With CVWorks, multi breath-hold imaging can be a thing of the past. Our latest Single Shot MDE and Black Blood techniques provide patient-friendly alternatives to uncomfortable breath-holds.

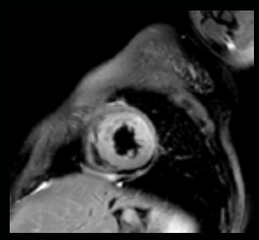
With our workflow-simplified QuickStep protocols, scanning whole body vasculature can be done in less than 6 minutes. High-performance gradients allow bright blood pool and myocardial tissue contrast on Cine FIESTA while preserving spatial resolution.



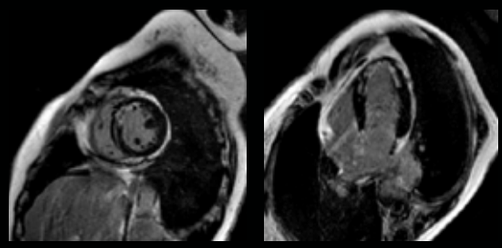
Inhance 3D DeltaFlow



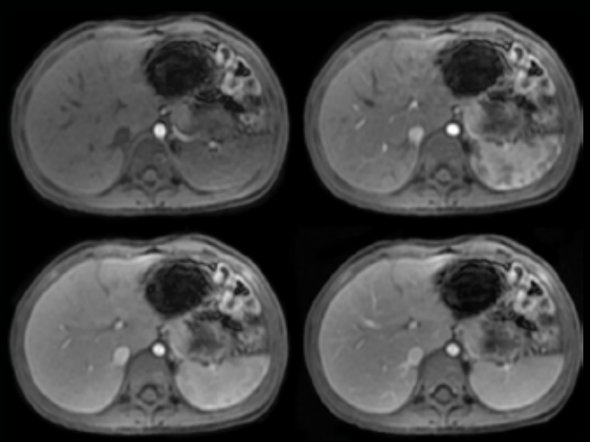
2D Cine FIESTA



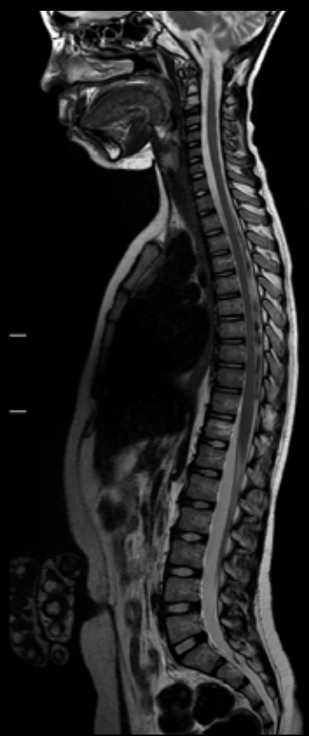
Black Blood – SSFSE



SS MDE



Navigated Turbo LAVA
Free Breathing Dynamic Liver
1.2 x 1.7 x 2.6mm
:25 sec / phase

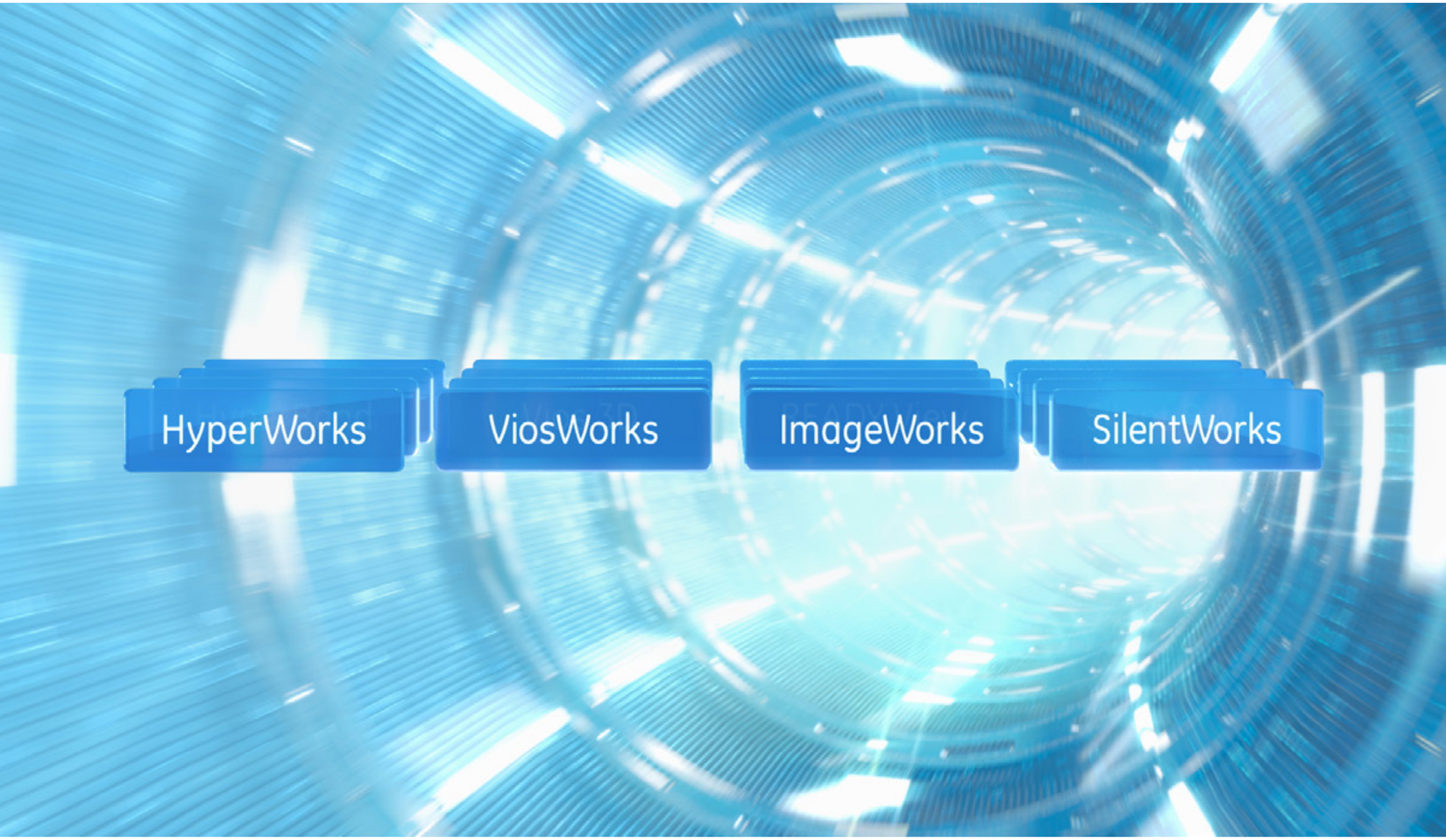


T2 frFSE Sagittal

PaedWorks

PaedWorks provides specialized protocols to simply address the needs of your smallest, most fragile patients. Techniques such as PB Navigators combined with PROPELLER MB are used with advanced techniques like diffusion imaging, allowing for patient-friendly, entirely free-breathing exams. Additionally, cardiac exams using Single Shot MDE provide faster, more reliable results.

Images on the left demonstrate dynamic T1 imaging with PB Navigator, which enables the patient to breathe freely while capturing contrast in fast temporal phases.
Whole spine evaluation can be obtained simply with routine T2 frFSE imaging (right).


HyperWorks
ViosWorks
ImageWorks
SilentWorks

Expand

Broaden your areas of expertise

Take your expertise to the next level when you move beyond the standard with SIGNA™Works innovative applications. Improved image quality, higher efficiency and a more streamlined workflow help you perform better than ever before.

HyperWorks
HyperWorks means hyper scanning with astonishing imaging and impressive speed. Exclusively introduced on SIGNA™ Pioneer's hardware and TDI platform, HyperWorks includes HyperSense, which delivers up to 8x faster results.*
** When used in combination with ARC.*

ViosWorks
For the first time, all 7 dimensions of information; 3D in space, 1D in time and 3D in velocity can be captured in a 10-minute or less cardiovascular scan. ViosWorks includes a cloud-based, real-time visualization tool, powered by Arterys™. ViosWorks is truly groundbreaking as it reduces the complexity and cost of cardiac imaging with improved results in a shorter amount of time.

SilentWorks
SilentWorks is GE's most advanced noise-reducing technology and strengthens our promise to transform the patient experience. Traditional exams can be as loud as a rock concert, but our innovative SilentWorks technology reduces sound levels to roughly the same as ambient noise.

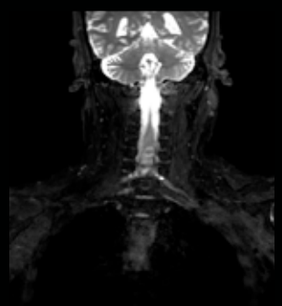
ImageWorks
ImageWorks boosts your overall MR performance through automation and advanced post-processing capabilities. READYView visualization and MAGiC one-and-done scanning help ensure consistent and clear results.

HyperSense is 510(k) pending with the FDA. Not available for sale in the United States and may not be commercially available in other regions.

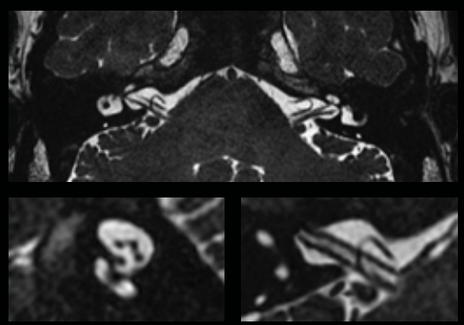
HyperWorks

HyperCube

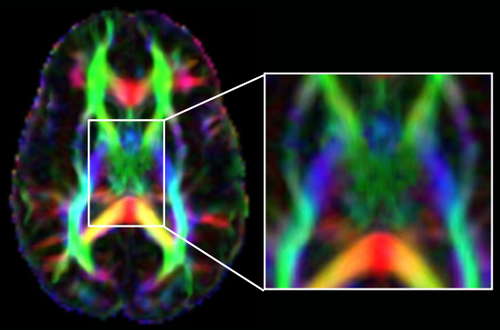
HyperCube expands the capabilities of 3D imaging, allowing you to significantly reduce scan times and eliminate artifacts such as motion and aliasing by reducing the phase field of view without the presence of aliasing artifacts.



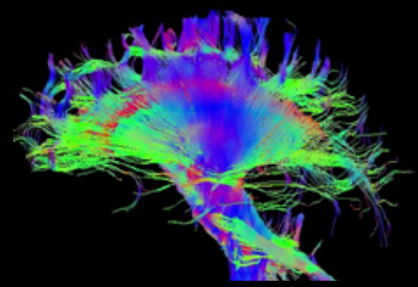
HyperCube T2 with Flex



HyperCube with HyperSense
IAC Cube T2
.5 x .5 x .6mm



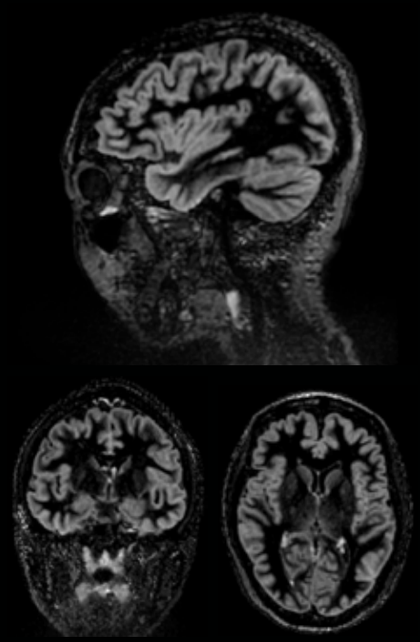
HyperBand FA Map



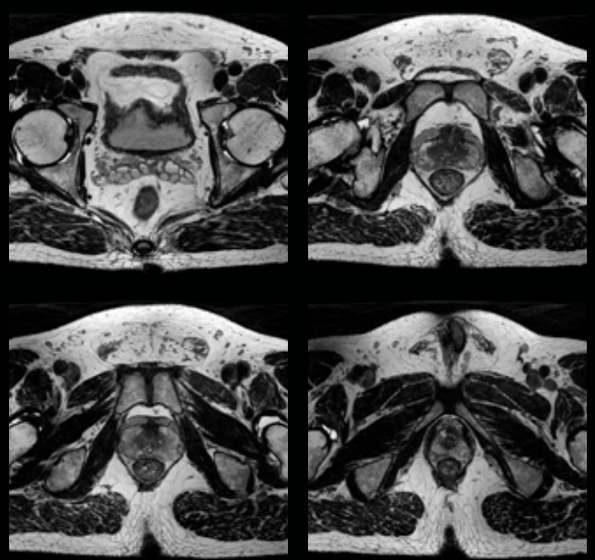
HyperBand DTI

HyperBand

HyperBand takes your diffusion to a new level by allowing you to acquire more slices or diffusion directions within a typical scan.



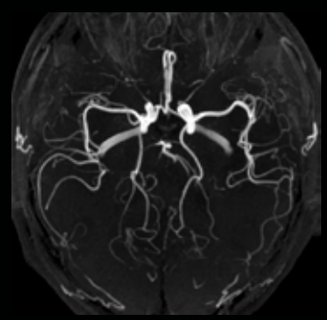
Cube DIR
1.4 x 1.4 x 1.4mm
3:09 min



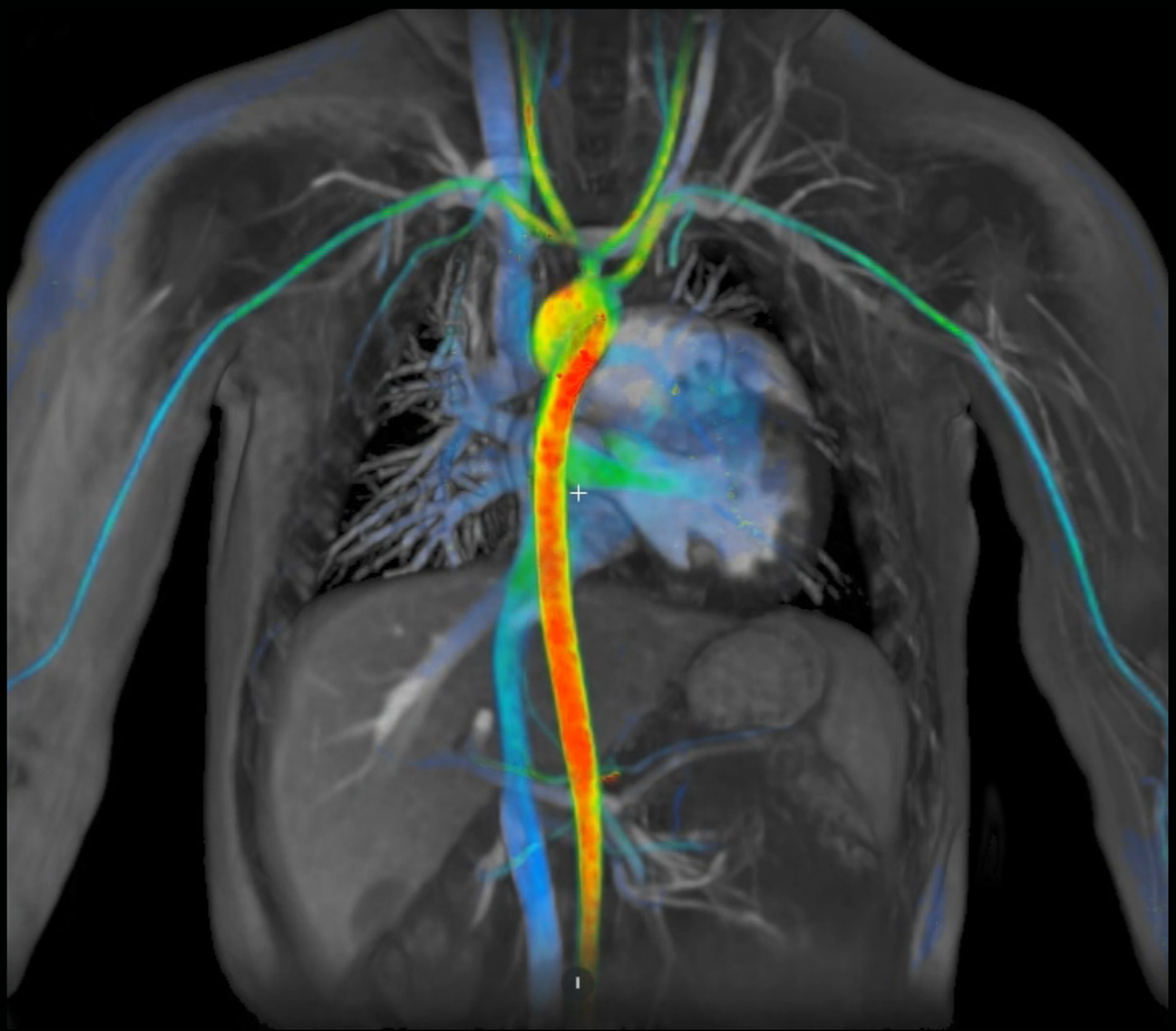
HyperCube T2 with HyperSense
.7 x .7 x .7mm
3:58 min

HyperSense

With HyperSense, you can obtain images with significantly fewer samples. HyperSense is not dependent on coil geometry and is less sensitive to image artifacts when compared to conventional parallel imaging techniques.



3D TOF
.6 x .6 x .6mm
3:29 min



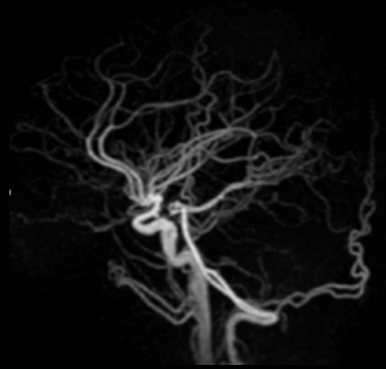
ViosWorks

ViosWorks, powered by Arterys™, provides detailed quantitative flow, regurgitant measurements and stroke volume. Thickness and mass and ejection fractions can be obtained with this precise and non-invasive solution.

Post-processing may not be available in all regions.

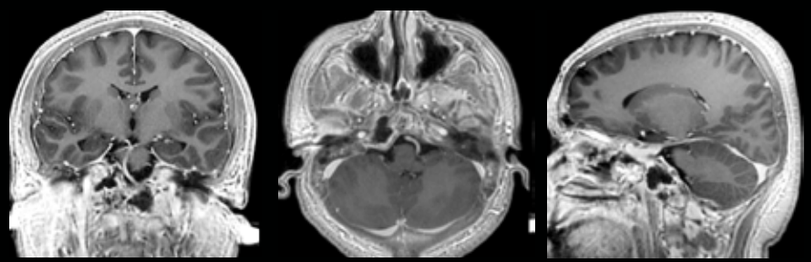
SilentWorks

SilentWorks is available across all anatomies and can be done with multiple weightings and coils, including DWI. Zero TE techniques enable imaging in vasculature structures with less artifacts that are commonly seen on traditional scans. And with new enhancements like 3D Silenz and PROPELLER MB, your exam time is shortened without compromise.

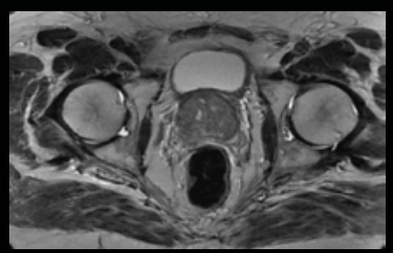


ZTE Silent MRA

DWI with SilentScan



3D T1 Sagittal SilentScan



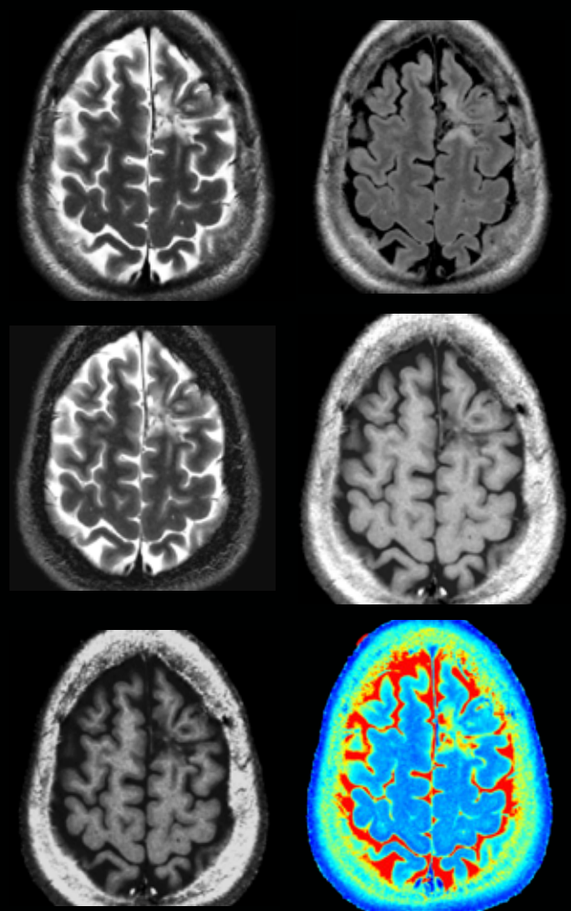
Silent T2 Axial

Silent T2 Sagittal

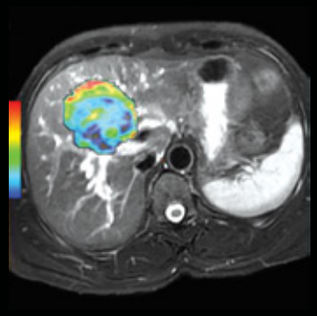
ImageWorks

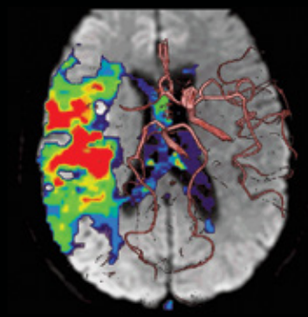
MAGiC

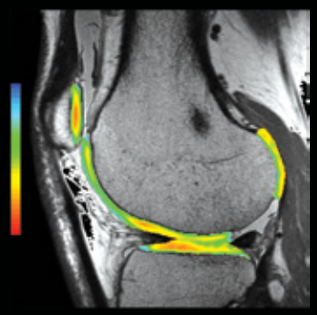
The secret of MAGiC lies in its unique ability to make possible multiple image contrasts in a single neuro scan. MAGiC delivers enhanced clinical flexibility by freeing up time for advanced imaging. MAGiC goes beyond the routine, providing complementary parametric data for a more complete picture. Image contrast can be changed by applying simple adjustments after acquisition.



T2, FLAIR (top), STIR, T1 (middle), T1 FLAIR and T2 maps (bottom) were acquired in one scan

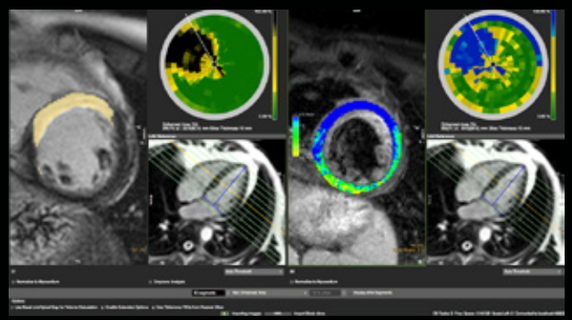


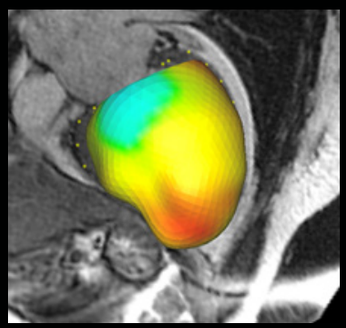


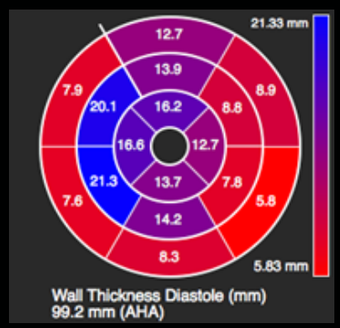


READYView

READYView helps simplify complex exams by providing a visualization platform that gives you access to advanced post processing technology. With READYView being directly available on the MR operator console, it accelerates workflow and reading readiness by eliminating time consuming post processing steps.





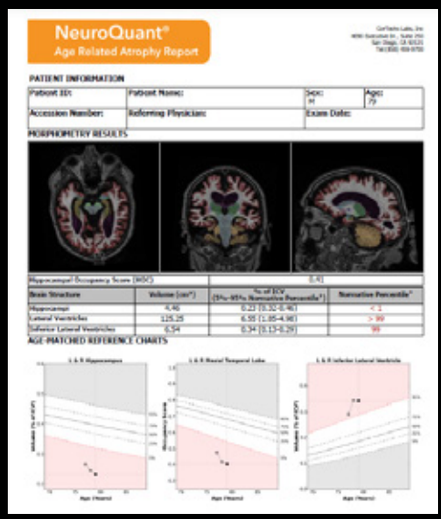


cmr^{42}

cmr^{42} is a comprehensive cardiovascular post processing solution that uses automated algorithms to assess tissue characterization, mapping, flow and function.

NeuroQuant

NeuroQuant automatically segments and measures volumes of brain structures and compares these volumes to norms. This information helps make a diagnosis and follow the progression of a disease. NeuroQuant can provide reports for a variety of clinical impressions, including Age Related Atrophy, Hippocampal Volume Asymmetry, Multi-Structure Atrophy, Triage Brain Atrophy, Brain Development and General Morphometry.



Sample images shown for post-processing capabilities only.

0 mm
00:00
Fan Light Control
SIGNA
Pioneer

Imagine

scans sharper than you thought possible.

Total Digital Imaging... a total imaging win.

The SIGNA™ Pioneer offers startling advances in imaging. Starting with pioneering technology called TDI. It stands for Total Digital Imaging, and it means greater clarity and increased SNR by up to 25%.

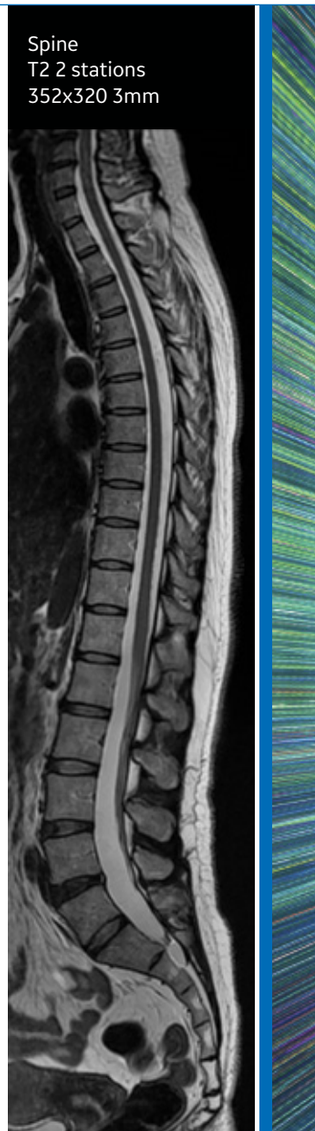
TDI is built on three fundamental components:

GE's **Direct Digital Interface (DDI)** employs an independent analog-to-digital converter to digitize inputs from each of 97 RF channels. Every input is captured and every signal digitized, literally redefining the concept of an RF channel. The result? Not only does DDI technology improve SNR of our images, but it also works with legacy GE coils for unmatched flexibility.

Digital Surround Technology (DST) combines the digital signal from every coil element with the signal from the integrated RF body coil. The superior SNR and sensitivity of the high-density surface coils are combined with the superior homogeneity and deeper signal penetration of the integrated RF Body Coil. The result? Richer, higher quality spine and body images.

Digital Micro Switching (DMS) technology represents a revolutionary advance in RF coil design by replacing analog blocking circuits with intelligent Micro Electro-Mechanical Switches (MEMS). The result? Coil design that supports ultrafast coil switching times for further expansion of zero TE imaging capabilities.

SIGNA™ Pioneer's novel RF architecture enhances 3D imaging capabilities, as well as resulting in superior image quality that is up to 25% better. This unique architecture strengthens applications like 3D ASL, for high SNR quantitative perfusion maps useful in many neurological diagnoses, and IDEAL IQ, for quantitative fat fraction maps of the liver to aid in diagnosis. And neither application requires contrast injections, eliminating both the cost of contrast and the pain of needles.



Maximize

Productivity by scanning one more patient per hour, every hour of every day.

Now, in addition to throughput benefits that are pure MAGiC, imagine being able to compensate for patient movement and free breathing during the scan, for consistently clear imaging and fewer repeat scans.

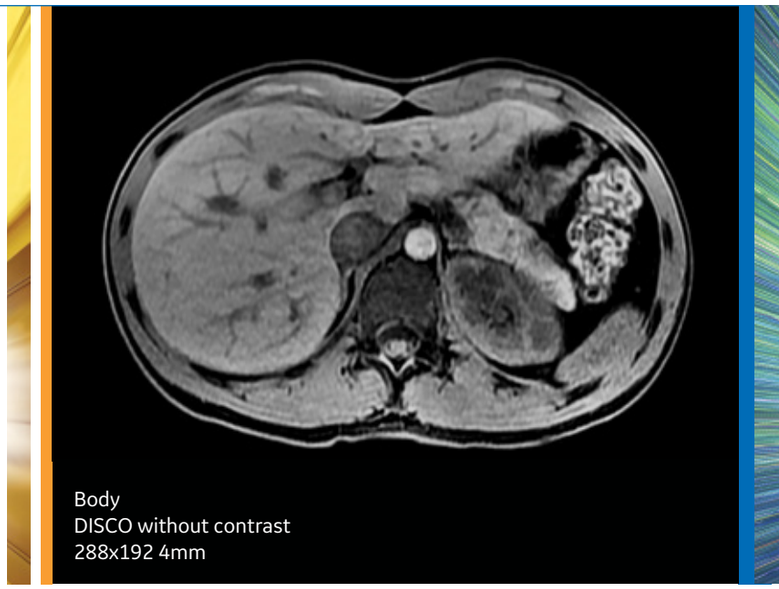
That's because the SIGNA™ Pioneer includes technologies like 3D PROMO, which provides a real time 3D navigator-based motion correction algorithm that corrects for corrupted, motion-induced data. The result? High resolution, motion-reduced 3D images. And of course, along with 3D PROMO, the SIGNA™ Pioneer also includes GE's proven PROPELLER technique.

The SIGNA™ Pioneer includes Auto Navigator, which delivers automated free breathing body imaging for maximum patient comfort. And for breath-hold imaging, the Turbo LAVA feature enables multiple high-resolution arterial phases in a single breath-hold, while also delivering shorter scan times.

MR as simple as CT.

SIGNA™ Pioneer is breaking even more new ground by introducing DISCO (Differential Sub-sampling with Cartesian Ordering) that delivers advanced MR body imaging that's as simple as CT. For instance, with DISCO you can now get rapid, robust volumetric imaging of the entire liver in less than 3 second intervals. Simultaneous scan and injection help eliminate the fear of missed bolus, incorrect injection timing, and missed enhancements, because each scan is done right the first time.

And GE's Auto Protocol Optimization feature, available for breath-hold scans, allows any user to quickly select among a set of predefined protocol parameters to easily adapt to any situation, in order to shorten scan time or to increase resolution or SNR.



Body
DISCO without contrast
288x192 4mm

Lower costs to set up and operate.

Now, imagine getting all of this in a system that first lowers your costs to set up the system on site, because its footprint is 25% smaller, and then goes on to lower your operating costs, by consuming 25% less power than conventional 3.0T wide bore designs. Put this together and it represents exceptional economics overall for a wide bore 3.0T MR system. Clearly, the SIGNA™ Pioneer is not just pioneering very big advances, but it is engineering them into a surprisingly small frame.

Astonish

Discover how the SIGNA™ Pioneer is designed to deliver an unmatched patient experience.

With the SIGNA™ Pioneer, we're pioneering patient-centered design built on new notions of higher patient comfort and lower patient stress.

First, eliminating MR scan noise has long been one of the most important goals in advancing MR technology. And with the SIGNA™ Pioneer and GE's SilentScan technology, that goal has been virtually achieved.

Soothing Silence.

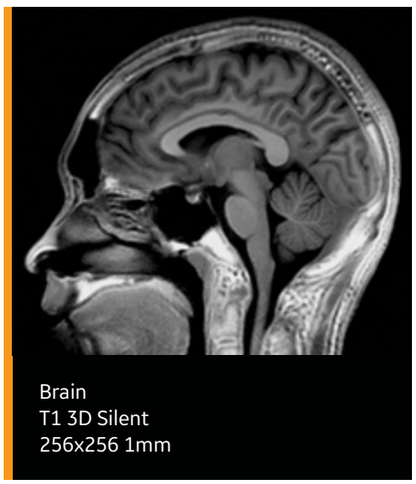
Thanks to SilentScan that is both revolutionary and proprietary, the SIGNA™ Pioneer reduces dB levels from an ear-splitting, motorcycle-level 91dB to within 3dB of scan room ambient noise.

Along with this dramatic advance comes the first-ever complete Silent Neuro Exam that includes Diffusion Weighted Imaging (DWI). In addition, we have expanded our Silent imaging capability beyond neuro imaging to musculoskeletal and spine imaging.

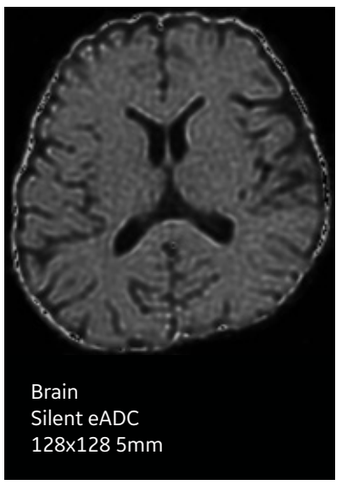
Now, the age-old problem of patients having to hold their breath or lay statue still? Consider that problem solved. With its advanced motion correction and free-breathing imaging applications, SIGNA™ Pioneer will compensate for patient movement.

And claustrophobia? The 70cm wide bore design means more space and less anxiety. And not only is the bore wider, but so is the table, offering the most comfort possible for your patients. The table even sits lower to the ground, making it easier for patients to get on and off.

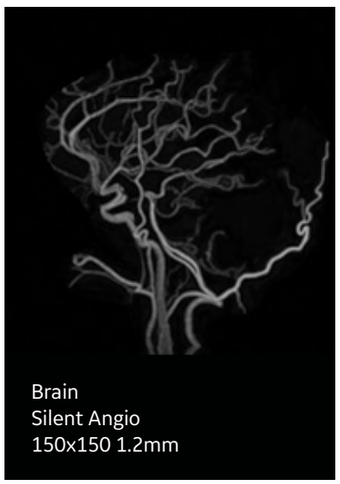
And what does all of this mean for patients? Quite simply, the SIGNA™ Pioneer is designed to deliver an unmatched patient experience.



Brain
T1 3D Silent
256x256 1mm

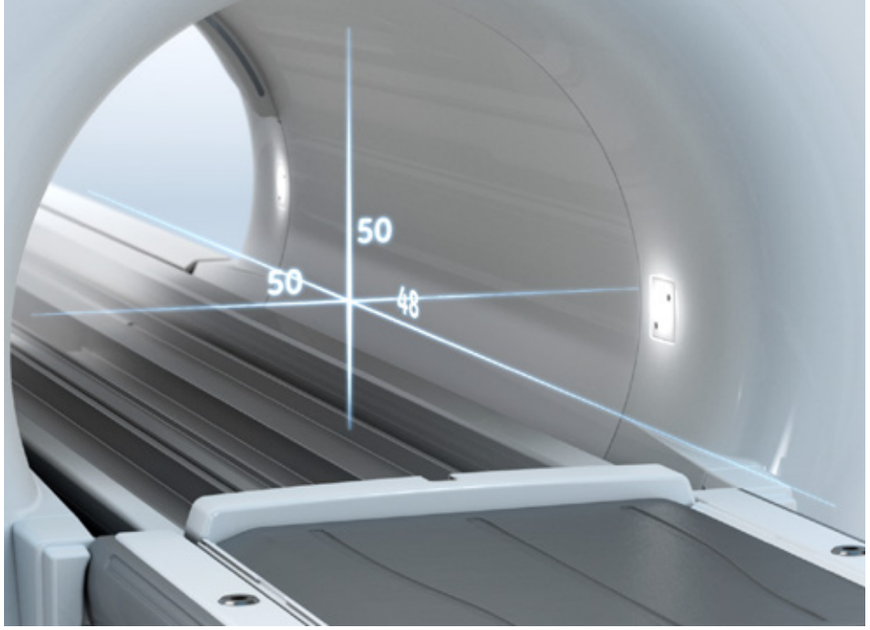


Brain
Silent eADC
128x128 5mm



Brain
Silent Angio
150x150 1.2mm

C-Spine
Silent T2
352x224 3mm



FOV

In addition to accommodating larger patients, full 50x50x48cm FOV in a 70cm wide bore allows you to properly image off-center anatomy such as shoulders and hips. The SIGNA™ Pioneer's phenomenal homogeneity enables our largest FOV ever, with higher gradient specifications. Additionally, excellent spatial integrity is provided by 3D GradWarp distortion correction. And no body part is left behind.

reFINE and deFINE

With reFINE, the challenge of 3.0T high-field uniformity has finally met its match. Just like a home theater surround system can be optimized, with reFINE, you increase your control over improved RF pulse efficiency, so you get clearer, crisper signals no matter your patient composition or position. reFINE makes consistent 3.0T imaging the rule, not the exception.

deFINE takes the results of SIGNA™ Pioneer to the next level by enhancing the image appearance with integrated, in-line, optimizable settings. These settings can be generated for each individual sequence or for the entire exam. With deFINE, you meet your high quality image needs and go beyond the normal.

About GE Healthcare

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our “healthymagination” vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality around the world. Headquartered in the United Kingdom, GE Healthcare is a unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employees are committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.

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