

GE Healthcare

# Envision

what you've always wished MR could do.

## SIGNA™ Pioneer

Imagine what MR can be.





# 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.



# 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.

Spine  
T2 2 stations  
352x320 3mm



# SIGNA Pioneer

With MAGiC

## SIGNA Pioneer is all about speed.

Imagine being able to scan one more patient per hour, every hour of every day ... that's the MAGiC (Magnetic Resonance Image Compilation) behind the SIGNA Pioneer's One and Done Imaging.

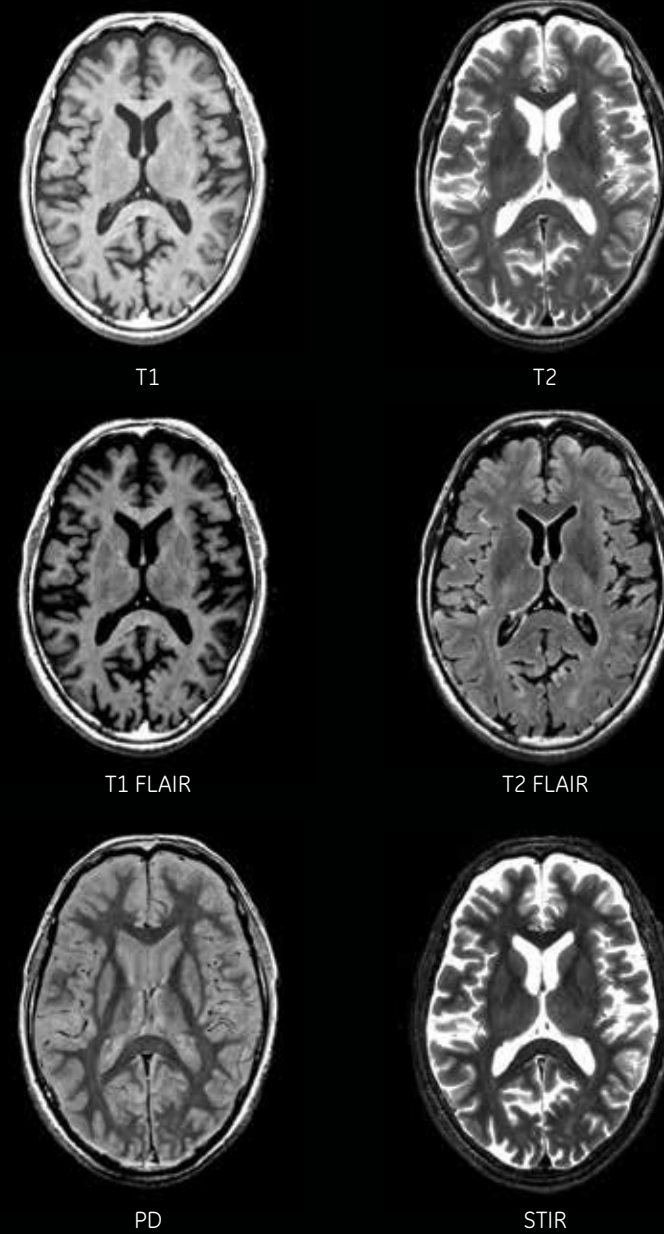
## The wonder of One and Done Imaging.

With One and Done Imaging, you can now capture multiple image contrasts in a single scan. One scan you can manipulate in countless ways. One scan that can do the work of many, with images acquired in as little as one-third the time.

## MAGiC Technology

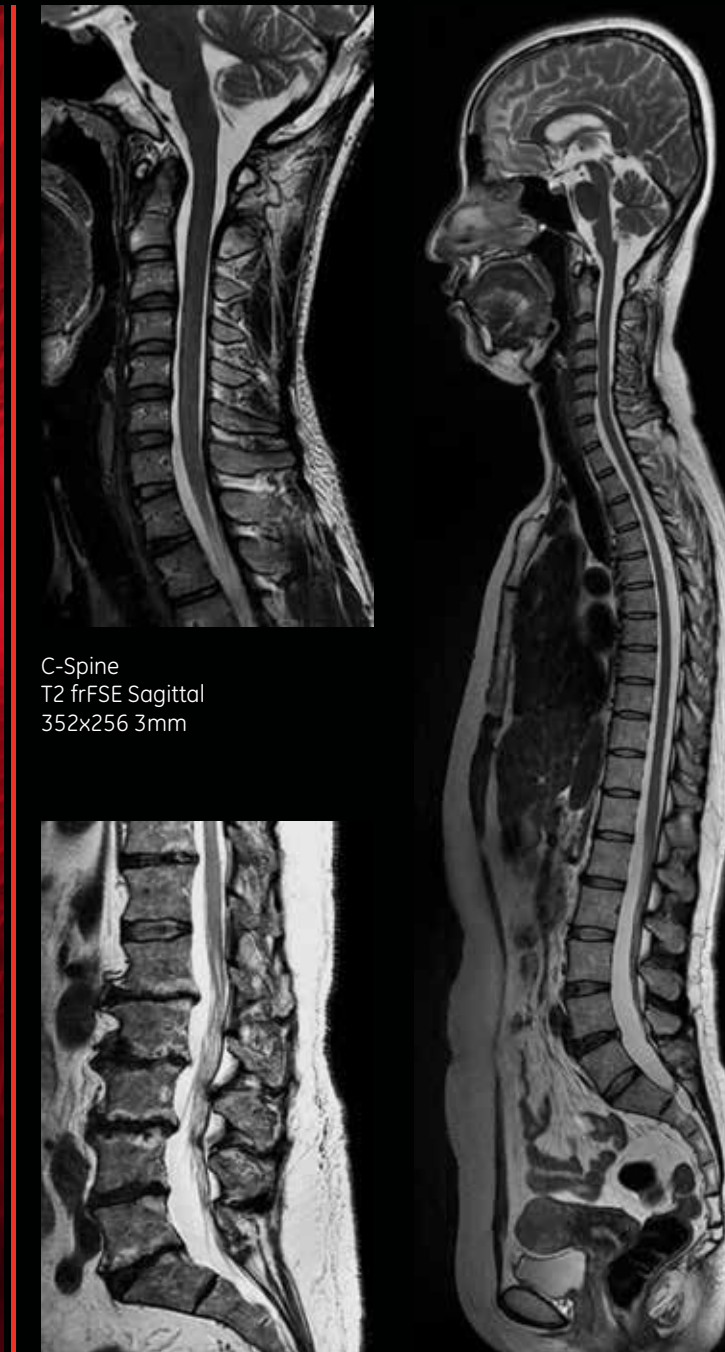
Now, how exactly does One and Done Imaging get it done? It really is MAGiC.

With this revolutionary technique, a single scan generates quantitative T1, T2, STIR, T1 FLAIR, T2 FLAIR and PD weighted images in one-third the total time taken to acquire separate sequences. And you can change the contrast of the image by manipulating TR and TE values after you have acquired the images. This technology helps ensure that you will not miss any detail in the images and means no more regretting that you acquired the wrong contrast. It will make you believe in MAGiC.

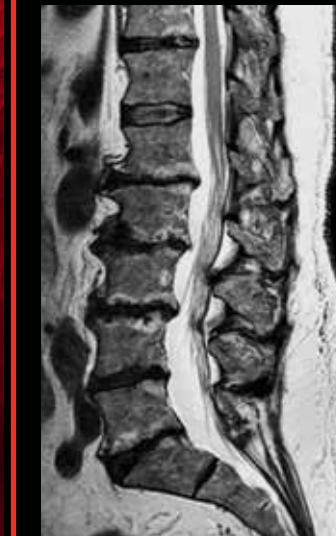


MAGiC Neuro Exam  
320x256 4mm  
5:46

MAGiC



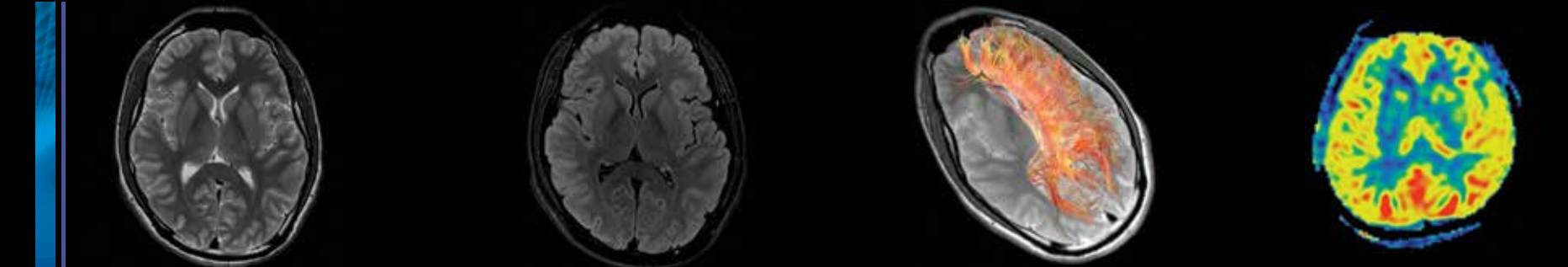
C-Spine  
T2 frFSE Sagittal  
352x256 3mm



L-Spine  
T2  
320x256 4mm

Central Nervous System  
T2  
352x320 3mm

Spine



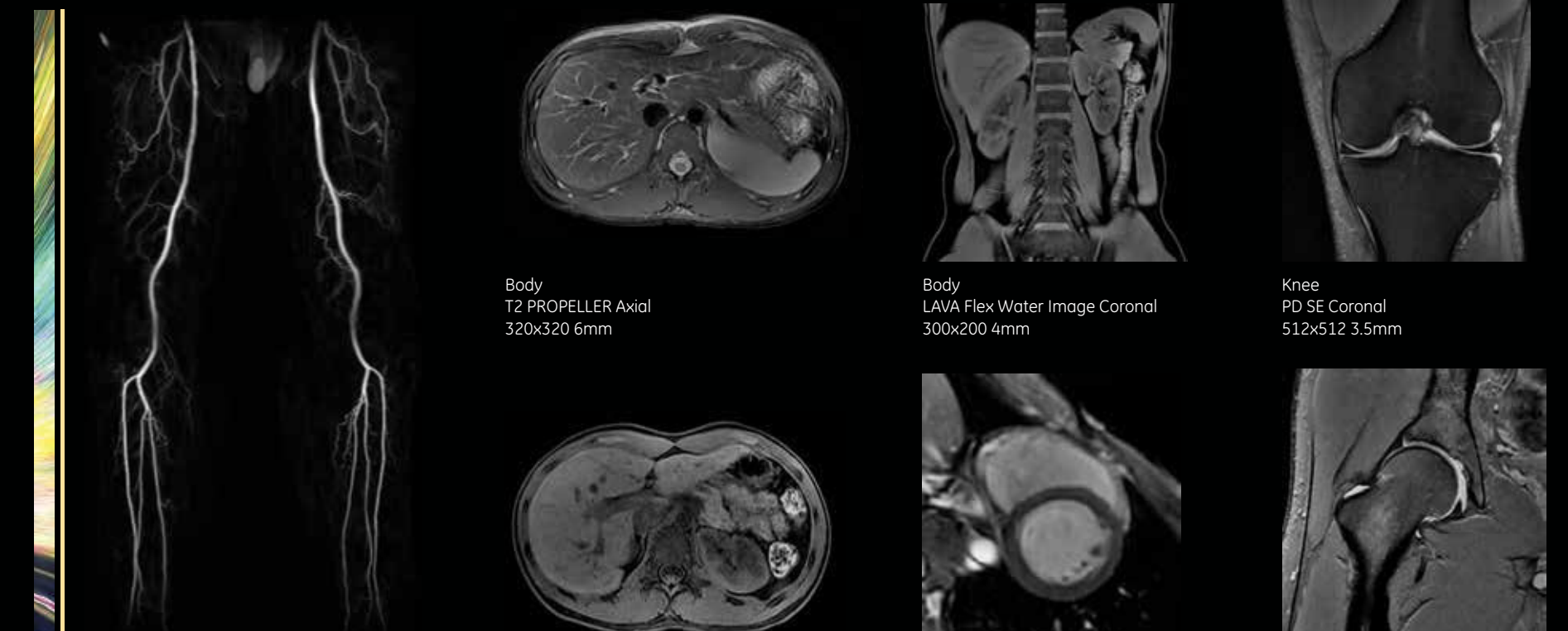
Brain  
T2 frFSE Axial  
384x384 5mm

Brain  
T2 FLAIR FatSat w ARC  
288x224 5mm

Brain DTI  
25 directions  
128x128 4mm

3D ASL  
Quantitative Blood Perfusion

Brain



Inhance DeltaFlow  
384x320 2.4mm

Body  
T2 PROPELLER Axial  
320x320 6mm

Body  
LAVA Flex Water Image Coronal  
300x200 4mm

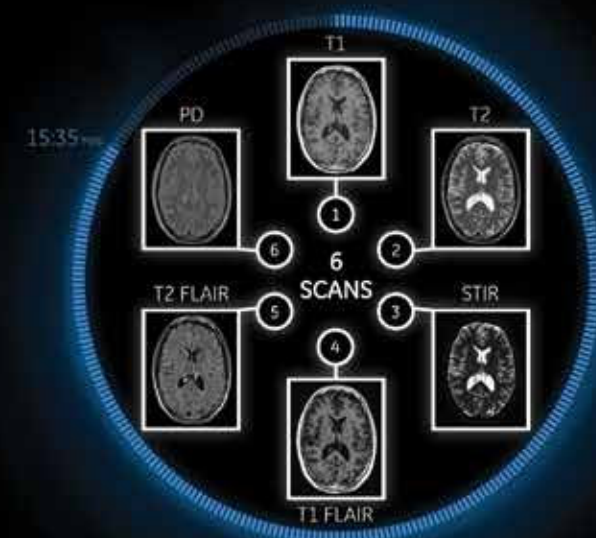
Knee  
PD SE Coronal  
512x512 3.5mm

Cardiac  
FIESTA  
188x200 8mm

Hip  
PD SE Coronal  
320x256 3mm

Body & MSK

## Conventional

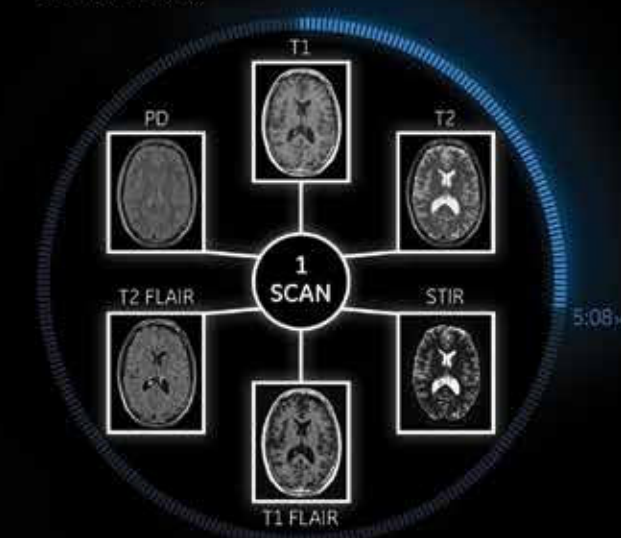


Six scans, one per contrast  
Scan time: 15:35 minutes



Imagine trying to photograph a beautiful landscape with six different elements in clear focus. Conventionally, it may require you to capture an individual image of each element separately in order to have the clearest focus possible.

## MAGiC One and Done



One MAGiC scan delivers six contrasts  
Scan time: 5:08 minutes



Now imagine if you could capture all six elements of the beautiful landscape all at once, in clear focus.

# 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.



## 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 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.

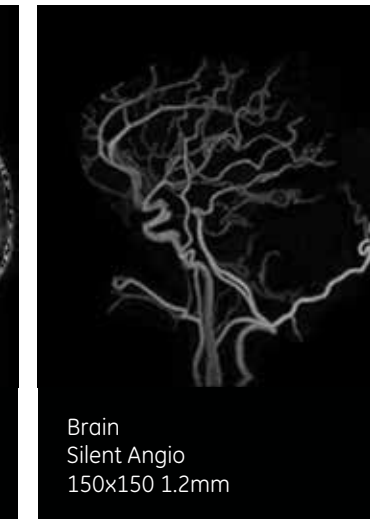
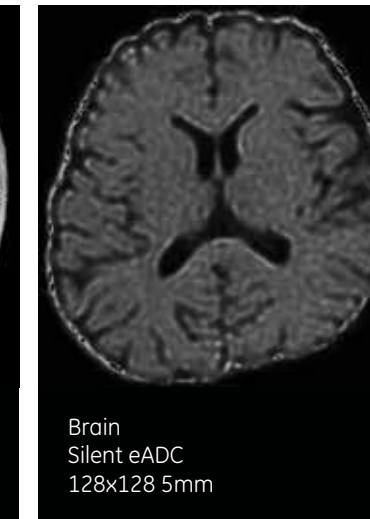
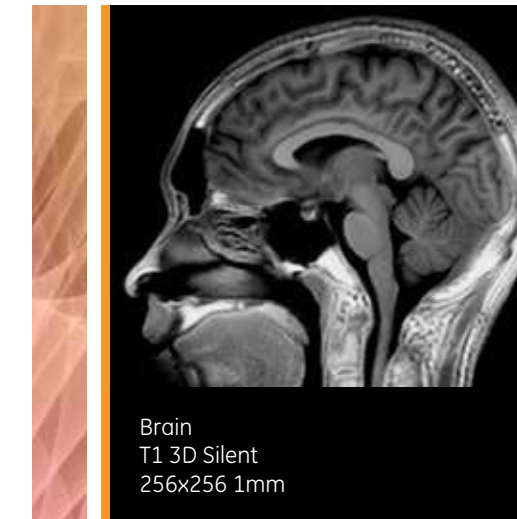
Along with this dramatic advance comes the first-ever complete Silent Neuro Exam that includes Diffusion Weighted Imaging (DWI). In addition, we have expanded our Silent imaging capability beyond neuro imaging to musculoskeletal and spine imaging.

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 70 cm 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.

SIGNA Pioneer.  
Imagine what MR can be.



## 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](http://www.gehealthcare.com).

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