GE HealthCare

SIGNA 7.0T

Scientific discovery meets clinical translation

Advancing scientific research and clinical translation.

Advanced research capabilities

Boost advanced applications such as DTI and fMRI with UltraG gradients

Enhanced diagnostic precision

with unmatched resolution and impressive contrast to noise ratio

Powered by Deep Learning applications

Effortless imaging enabled by AIR™ Recon DL

Familiar user interface

Enables seamless clinical translation

Impressive yet familiar

SIGNA™ 7.0T Magnet

The result from a collaboration between GE HealthCare and Tesla Engineering (Storrington, UK), SIGNA 7.0T, delivers state-of-the-art performance, stellar uniformity and unparalleled stability at a 60cm bore diameter.

UltraG Gradient Platform

Leverage powerful and fast switching gradients for enhanced imaging performance.

RF Architecture

Direct Digital Interface allows for an independent analog-to-digital converter for each channel, eliminating unnecessary noise enhancement.

Custom development

Software development toolkits enable custom reconstruction pipelines and sequence design.

Imaging capability at the intersection of the clinic and laboratory.

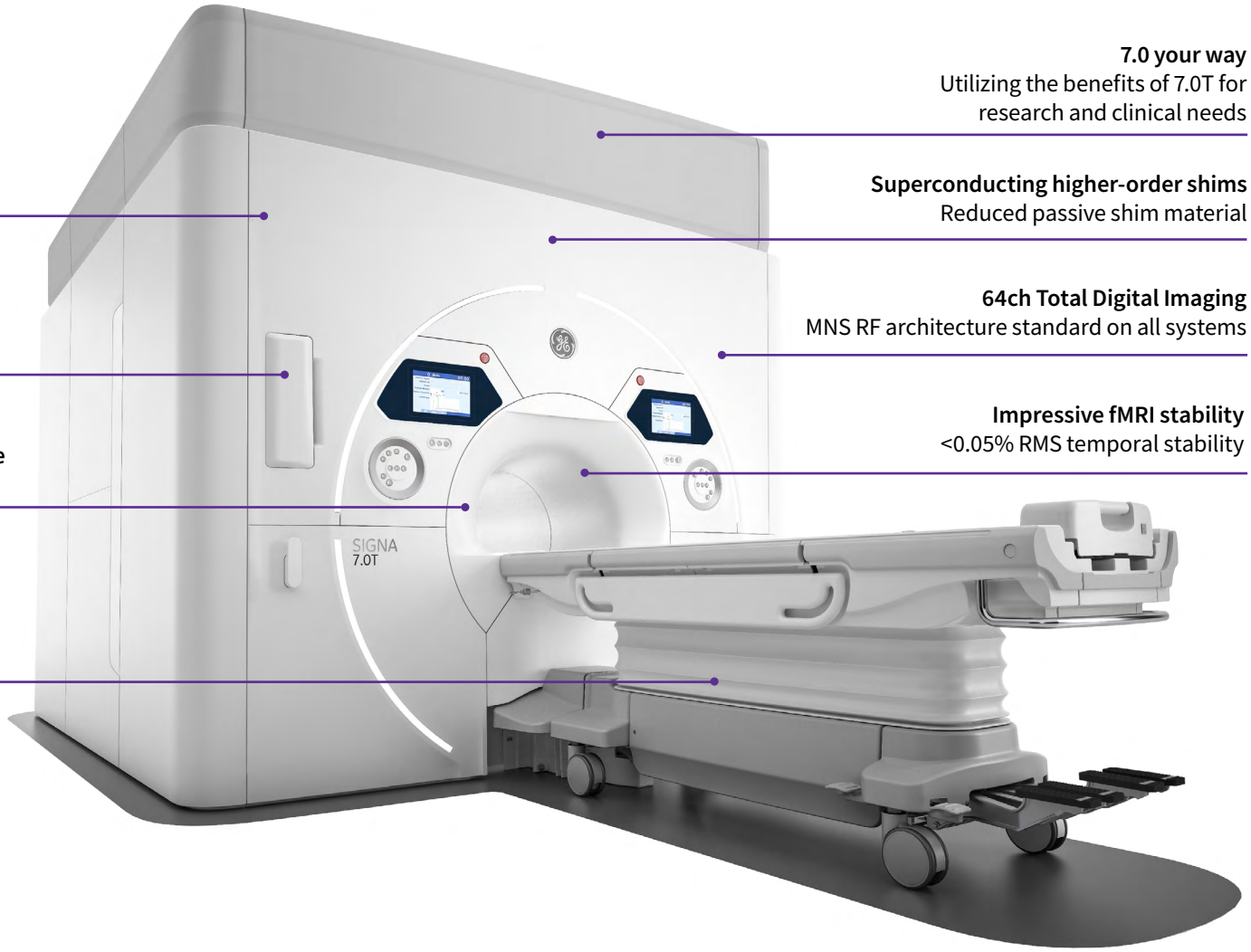
Designed to overcome the limitations of many of today's clinical MR systems, SIGNA 7.0T is a powerful new platform for advancing scientific research and clinical translation. Approximately five times more powerful than most clinical systems, SIGNA 7.0T is designed to detect subtle structures that may be significant for clinicians and researchers alike.

Robust developer tools
EPIC and Orchestra for pulse sequence development and reconstruction

Dual mode*
Clinical and research

UltraG gradient performance
113mT/m – 260T/m/s

Detachable table
Standard on all systems



7.0 your way
Utilizing the benefits of 7.0T for research and clinical needs

Superconducting higher-order shims
Reduced passive shim material

64ch Total Digital Imaging
MNS RF architecture standard on all systems

Impressive fMRI stability
<0.05% RMS temporal stability

* Research mode is not intended for clinical use. Research operation may require observation of national regulations.

Research and Clinical Mode* – Made easy

SIGNA 7.0T bridges the gap between clinical and research MR imaging.

Switch between clinical and research modes for easy protocol deployment, no restart required.

* Research mode is not intended for clinical use. Research operation may require observation of national regulations.

SIGNA 7.0T for scientific research

Research without compromise.

Harness the power of 7.0T and unlock new capabilities that open the door for scientific discovery. Ultra-high resolution images, finely resolved fiber-tracking and exceptional fMRI. With a single system.

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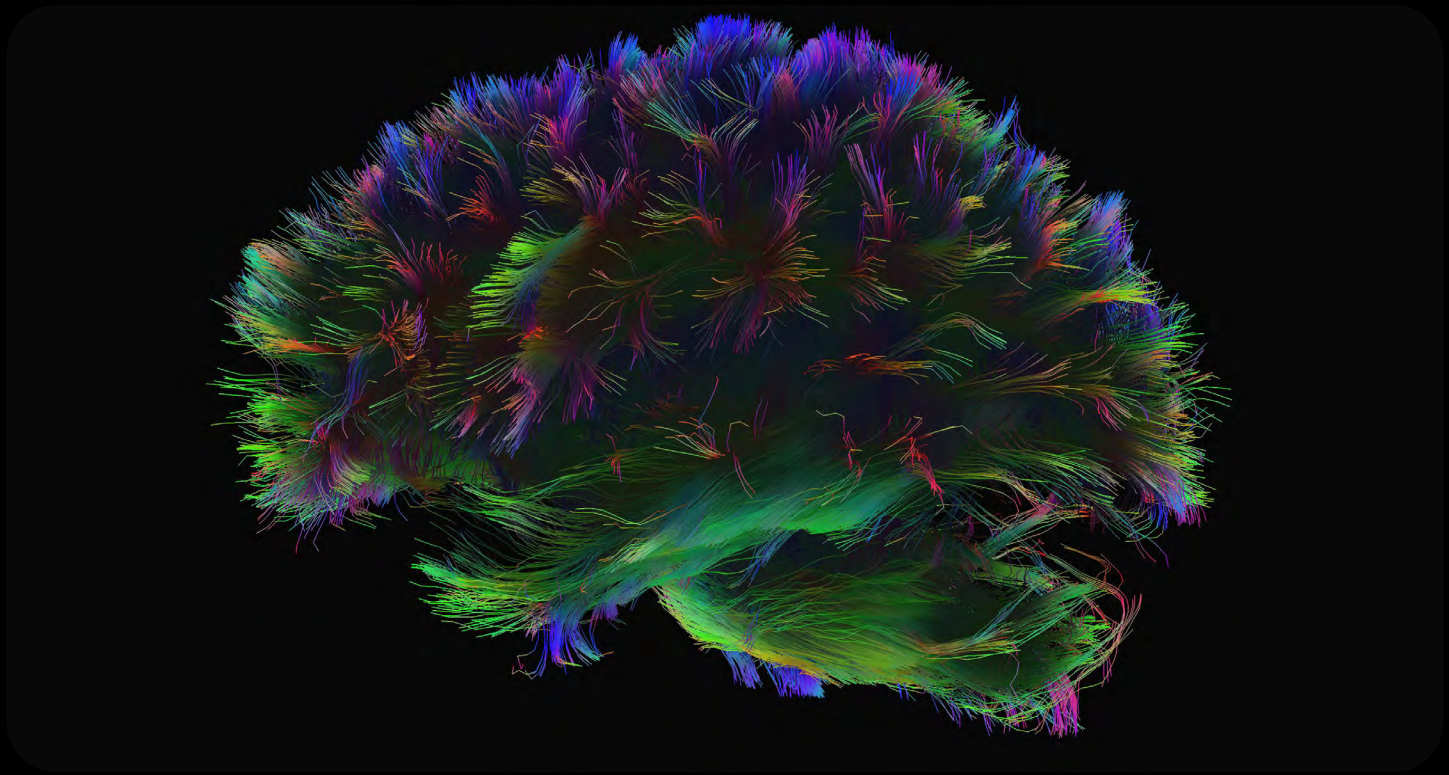
  Research operation may require observation of national regulations.

SIGNA 7.0T for scientific research

Ultra-clear Diffusion Tensor Imaging

For advanced clinical and research needs, the system delivers impressive results with diffusion tensor imaging (DTI). An advanced technique often used to visualize the white matter architecture and integrity of normal and diseased brain.



Fiber Track Images, Diffusion Tensor Imaging
1.5 mm isotropic resolution, TE 69 ms, TR 4105 ms
b=2000 s/mm^2, 64 Directions

SIGNA 7.0T for scientific research

Precision tools

Powerful RF Architecture for uncompromised research

Research mode*

MNS*:

8 kW of transmission power coupled with a 64 channel receive chain, supports the commonly imaged low gamma nuclei from ^{17}O to ^{31}P. The flexible design supports multichannel configurations for multinuclear receive arrays - providing both ^{1}H and Multinuclear Spectroscopy and Imaging without moving the subject.

Multichannel*:

SIGNA 7.0T Precision transmit technology powers 8 x 2.5kW channels in ^{1}H imaging and spectroscopy modes. These 8 channels may be driven by a common waveform kernel with individual phase and amplitude control per channel, to support parallel transmit for B_1 uniformity.

Designer extensions:

Development tools such as EPIC allows for pulse sequence development and virtual deployment. In addition, Orchestra enables custom reconstruction pipelines for advanced applications.

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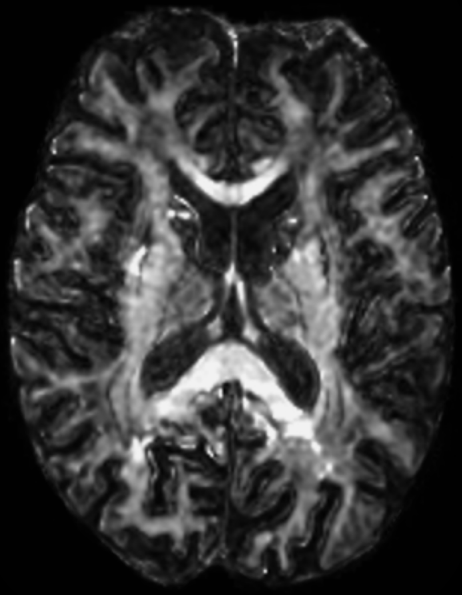
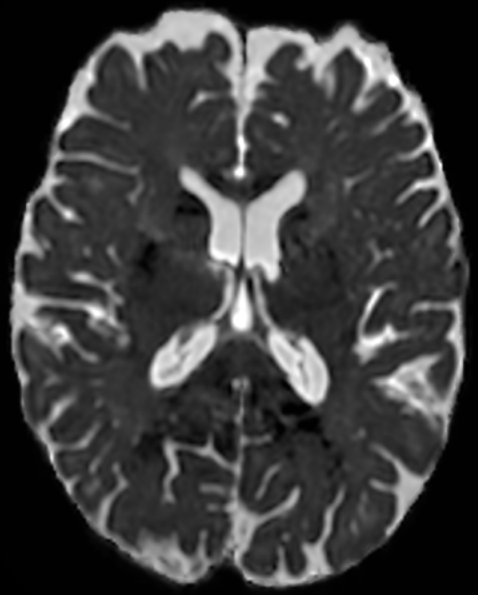
SIGNA 7.0T for scientific research

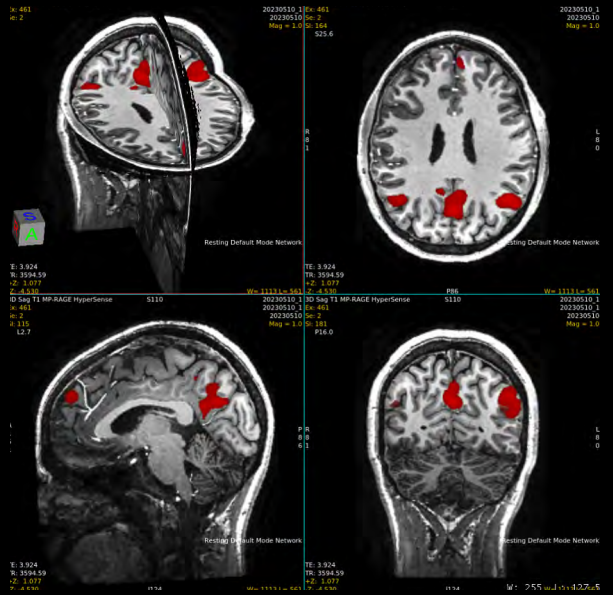
Neuro



FA Map calculated from b=1000 s/mm^2



ADC Map calculated from b=1000 s/mm^2



Resting State fMRI, TE 23 ms, TR 2500 ms, 150 volumes, 40 slices/HB2 x 2 in plane

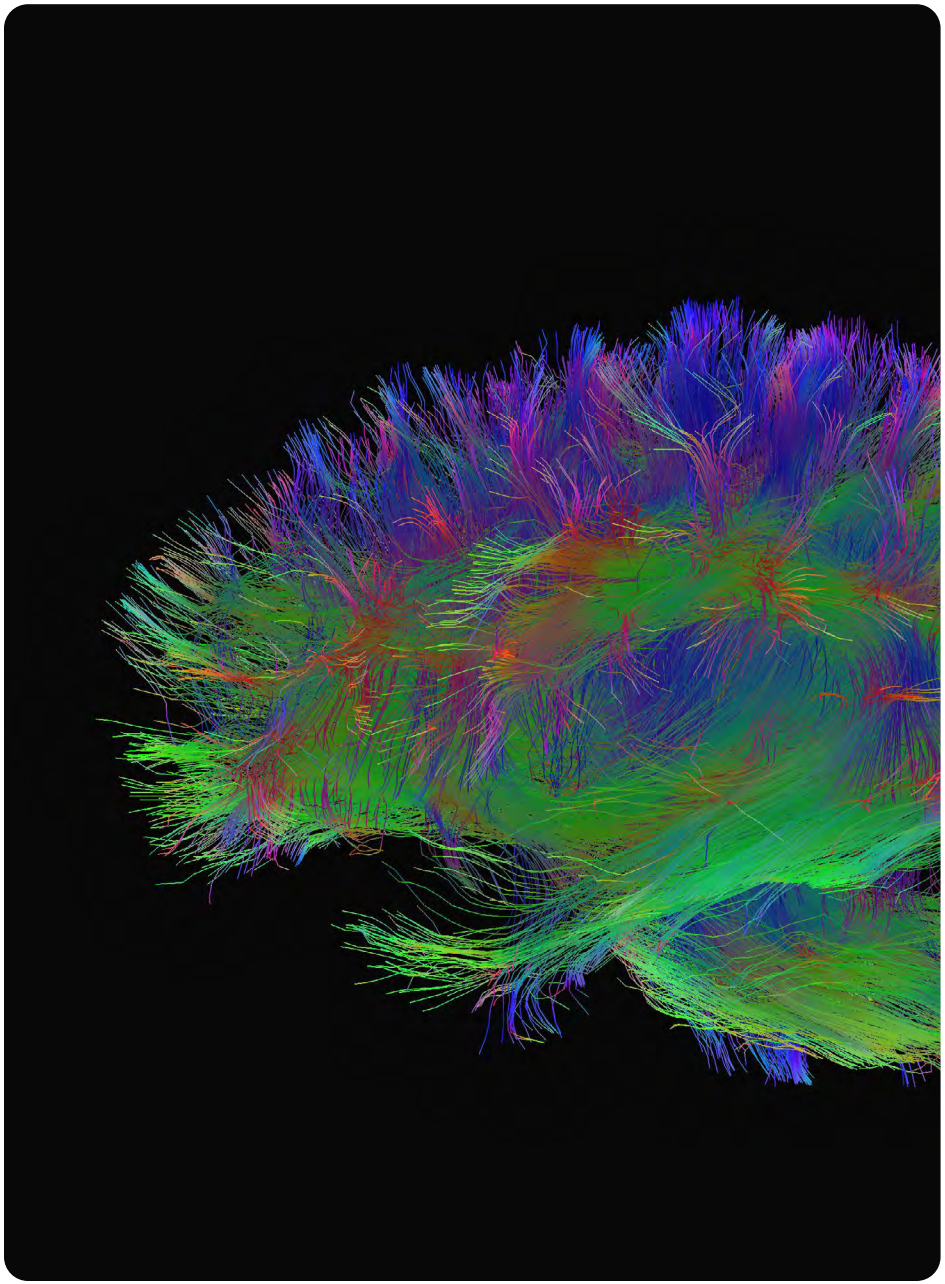
AIR Recon DL, 2ch Tx, 32ch Rx - Head coil – MR30, 1.5 mm isotropic resolution, TE 69 ms, TR 4105 ms, b=0 (8) + 1000 (64) + 2000 (64) + 4000 (64)

SIGNA 7.0T in the clinic

Clinical confidence enhanced by UltraG gradients and AI.

SIGNA 7.0T overcomes the most challenging clinical demands, featuring state-of-the-art workflows and delivering consistency, efficiency and reproducibility.

SIGNA 7.0T brings the advantages of Ultra High Field, such as elevated signal-to-noise ratio and increased specificity via crisp contrast to the clinic. Make clinically relevant breakthroughs with familiar state-of-the-art applications such as, PROPELLER, SWAN and DWI and our innovative AI tools, AIR x™ and AIR Recon DL.



SIGNA 7.0T in the clinic

Advanced technology made accessible

Actively Shielded Magnet:

Reduces minimum room size requirements and increases flexibility in site layout and design. Zero boil-off design eases service and maintenance requirements and costs.

UltraG Gradient Platform:

SIGNA 7.0T UtraG gradient technology enables high order shimming to elevate spectroscopic methods and reducing artifacts due to inhomogeneities.

fMRI:

Enhanced BOLD signal makes for effortless fMRI studies with temporal stability less than 0.05%.

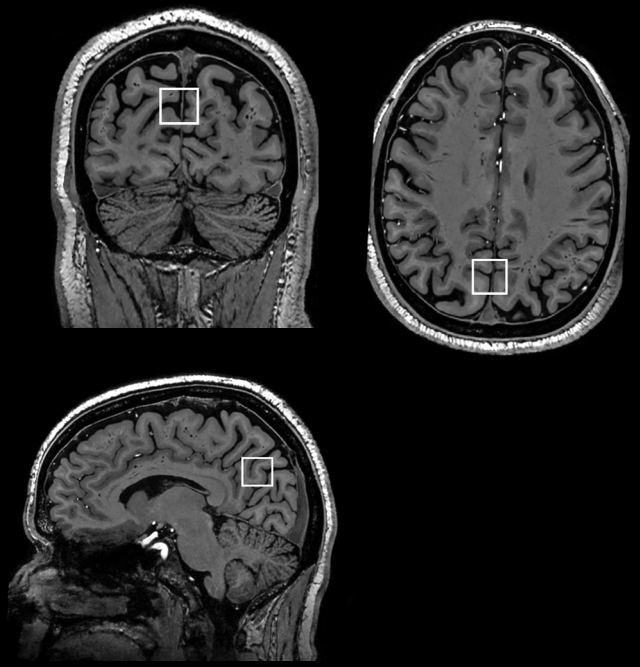
Direct Digital Imaging Platform:

Robust RF architecture reduces unnecessary noise by offering an independent analog-to-digital converter for all channels.

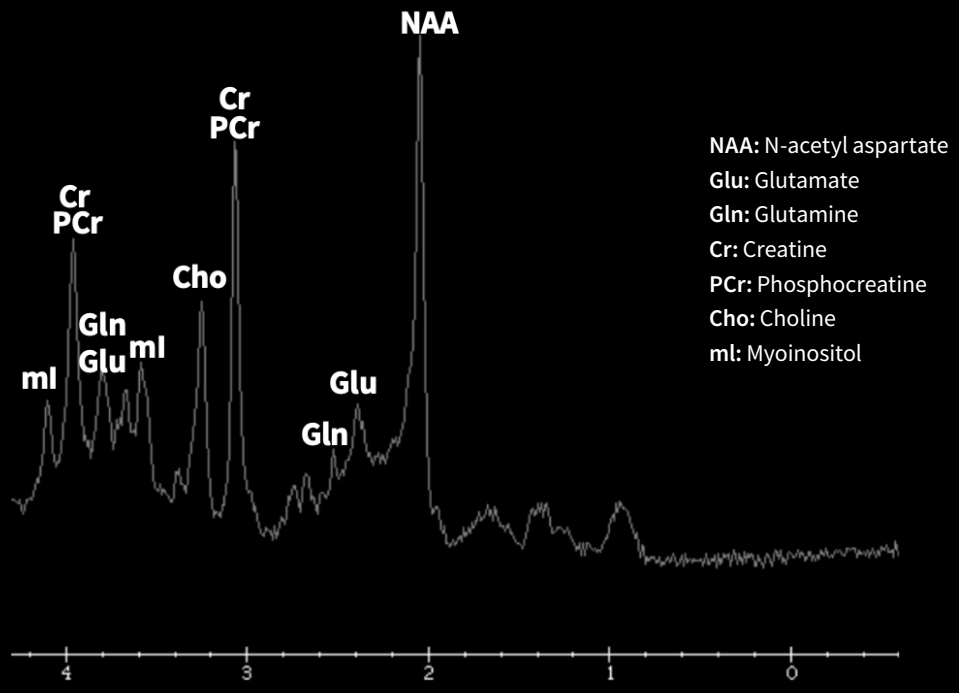
SIGNA 7.0T in the clinic

semiLASER Spectroscopy

semiLASER is a double spin echo single-voxel MRS technique that uses a slice selective non-adiabatic excitation along with two pairs of adiabatic slice-selective refocusing pulses for volume selection. The adiabatic pulses compensate for B_1 inhomogeneity while increased pulse bandwidth addresses chemical shift displacement errors.



2ch Tx, 32ch Rx - Head coil – MR29



NAA: N-acetyl aspartate
Glu: Glutamate
Gln: Glutamine
Cr: Creatine
PCr: Phosphocreatine
Cho: Choline
ml: Myoinositol

semiLASER spectroscopy, TE=30ms
20 x 20 x 20 mm, **3:30 min**

SIGNA 7.0T in the clinic

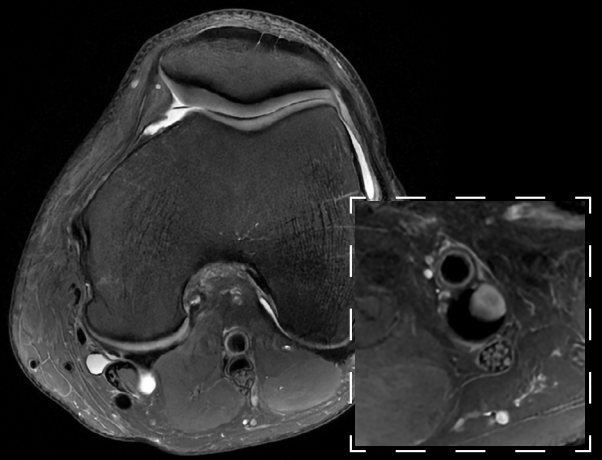
Knee imaging

Full knee protocol in 5:29 min with AIR Recon DL

Sagittal T1,
0.4 x 0.4 x 2.5 mm, **1:36 min**

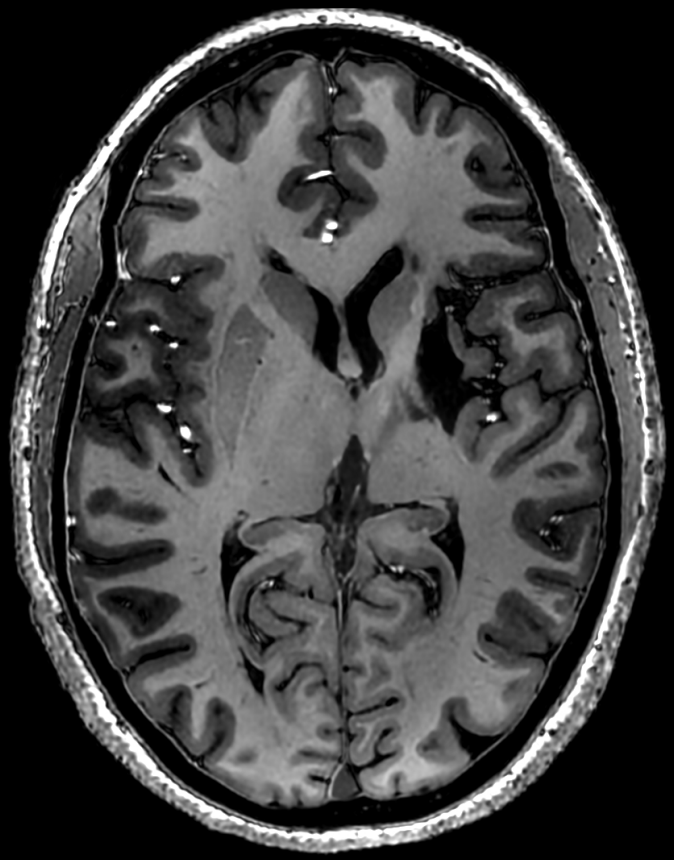
Sagittal PD FatSat ,
0.4 x 0.4 x 2.5 mm, **1:31 min**

Coronal PD FatSat,
0.4 x 0.4 x 2.5 mm, **1:03 min**



Axial PD FatSat,
0.4 x 0.4 x 2.5 mm, **1:19 min**

Brain imaging – Left hemisphere impairment



AIR Recon DL, Axial Reformatted plane from
3D Sagittal T1 MP-RAGE, 0.7 x 0.7 x 0.7 mm

SIGNA 7.0T in the clinic

Familiar, powerful apps

Boost productivity and efficiency with the MR applications for SIGNA 7.0T

SIGNA 7.0T platform features imaging applications that standardize base pulse sequences, workflow and visualization tools and enables high productivity with exceptional quality and outcomes across 1.5T, 3.0T and 7.0T systems. SIGNA 7.0T provides a comprehensive portfolio of robust applications for nearly any clinical protocol. Among nearly 40 standard applications, several stand out.

PROPELLER

is designed to reduce the effect of patient voluntary and physiologic motion (breathing, flow, peristalsis), and reduce magnetic susceptibility artifacts, PROPELLER works well for neuro and extremity imaging.

Cube

with various contrasts such as T_2 FLAIR, can help visualize even small and subtle lesions without partial-volume averaging effects.

AIR Recon DL

is a pioneering, deep learning based reconstruction algorithm that improves SNR and image sharpness, enabling shorter scan times. It improves image quality at the foundational level by making use of the raw data to remove image noise and ringing.

SWAN

helps clearly delineate small blood vessels, microbleeds, and large vascular structures in the brain. At 7.0T it can be used to visualize iron and calcium deposits by providing both phase and magnitude images to aid in an easier diagnosis.

PROMO

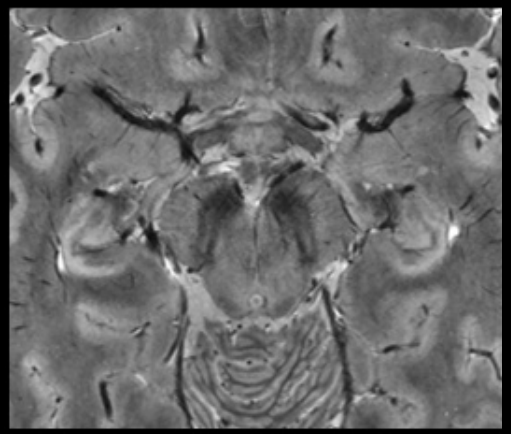
(Prospective motion correction) is a real time 3D navigator-based motion correction technique compatible with 3D sequences such as Cube, BRAVO and MP-RAGE.

Silent T_1

also known as Silenz, is a 3D Zero-TE sequence comprising high bandwidth excitation and reduced gradient switching radial acquisition that results in sound levels near ambient. Silenz has added flexibility in sequence prescription for anisotropic resolution enabling faster scan times and includes axial as well as oblique geometries.

SIGNA 7.0T in the clinic

Brain Imaging



Axial 3D SWAN, 0.3 x 0.2 x 0.8 mm

Coronal 3D MIP image from Axial 3D TOF, 0.4 x 0.4 x 0.6 mm

About GE HealthCare Technologies Inc.

GE HealthCare is a leading global medical technology, pharmaceutical diagnostics, and digital solutions innovator, dedicated to providing integrated solutions, services, and data analytics to make hospitals more efficient, clinicians more effective, therapies more precise, and patients healthier and happier. Serving patients and providers for more than 100 years, GE HealthCare is advancing personalized, connected, and compassionate care, while simplifying the patient's journey across the care pathway. Together our Imaging, Ultrasound, Patient Care Solutions, and Pharmaceutical Diagnostics businesses help improve patient care from diagnosis, to therapy, to monitoring. We are a $19.6 billion business with 51,000 colleagues working to create a world where healthcare has no limits.

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