

# Intelligent, future-forward MR



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It's an exciting time to be in MR. The continuous demand for MR imaging, fueled by the increasing disease burden and population demographics, continues to feed MR procedures growth and expansion across multiple clinical specialties, from neurology and oncology to cardiology, pediatrics and sports medicine. In China we see growing interest in high precision tools for neuro and oncology assessment, such as PET/MR and 7.0T. In Europe, several institutions seek to incorporate more sustainable solutions to their departments to remain energy, helium and operationally efficient. In North America, the clinical pressures of complex imaging examinations, increasing referral backlogs and staffing shortages demand higher productivity and more efficient and patient-friendly workflows.

At GE HealthCare, we are preparing for tomorrow with intelligent, future-forward MR systems and technologies. As Kelly Londy writes, our focus is to solve our customers' primary needs: fast, accurate MR imaging, increased geographical, demographical and clinical access to care for all patients, and actionable diagnostic insights. We're excited to share that our latest innovations deliver on the promise of more accurate, accessible and actionable health outcomes.

This year at the 2024 Annual Meeting of the Radiological Society of North America (RSNA), we are excited to announce the US FDA clearance of SIGNA™ MAGNUS<sup>†</sup>, an ultra-high performance 3.0T head-only MRI system designed to advance both clinical imaging and neuroscientific discovery. We also unveil the US FDA-pending Sonic DL™ for 3D<sup>‡</sup>, enabling up to 12-times acceleration factors for brain, spine, orthopedic and body imaging, as well as the compatibility of Sonic DL with AIR™ Recon DL for an altogether better diagnostic result at ultra-high speed with ultra-high clarity. Finally, we are happy to showcase our latest 1.5T MRI system, SIGNA™ Champion, a high-throughput, scalable and sustainable platform designed for patients everywhere.

Accuracy, accessibility and adaptability are the words that best describe the latest advancements in MR from GE HealthCare. From the neurological precision of SIGNA MAGNUS to the equitable access the SIGNA™ Continuum™ upgrade program offers across the GE HealthCare MR fleet and to the adaptability and versatility of deep-learning techniques such as Sonic DL and AIR Recon DL, we are committed to innovating MR for everyone by making our solutions available across our portfolio. Our oath to you is that GE HealthCare will continue to enable clinicians to improve access and outcomes for patients everywhere. **S**

<sup>†</sup> SIGNA MAGNUS is 510(k) cleared with the US FDA. Not yet CE Marked. Not available for sale in all regions.

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## Life-speed imaging in 3D

Building on the success of Sonic DL™ for Cine imaging in cardiac MR, GE HealthCare is introducing Sonic DL for 3D<sup>‡</sup> MR sequence. Sonic DL is a deep-learning-based image acquisition acceleration technique that will be available for use on GE HealthCare 1.5T, 3.0T, and 7.0T\* MR systems. Sonic DL reconstructs MR images from highly undersampled data, and thereby enables acceleration factors up to 12 times compared to fully sampled datasets—an 86% reduction in scan time versus a fully sampled acquisition. Its underlying technology is a Convolutional Neural Network (CNN) powered iterative reconstruction technique for vastly under-sampled data.

When compared to equivalently under-sampled—but conventionally reconstructed data—Sonic DL images will demonstrate image quality approaching that of a fully sampled dataset. When used in sequences while holding time constant, Sonic DL can decrease the acquired voxel size, enabling resolution improvement. Images acquired with Sonic DL can be reconstructed with AIR™ Recon DL<sup>‡‡</sup> to further improve image quality by removing noise and ringing.

In this issue of *SIGNA Pulse of MR*, see the articles on pages 8 (The democratization of cardiac MR) and 66 (Introducing Sonic DL for highly accelerated isotropic acquisitions). **S**

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\*Sonic DL for 2D FIESTA Cine not available on SIGNA™ 7.0T.

<sup>‡‡</sup>AIR Recon DL available as a separate option.

# More to explore with SIGNA MAGNUS

The latest MR technology for neuroscience and neuroimaging is now US FDA cleared. SIGNA™ MAGNUS<sup>2</sup> is a cutting-edge MR scanner for both clinical and research users. At the heart of the new system is the MAGNUS head-only, high-performance gradient coil developed in collaboration between GE HealthCare, the United States Department of Defense (DOD) and National Institutes of Health (NIH). Since 2020, a growing number of conference presentations and published papers have further established the broad capabilities in both clinical and academic neuroscience by enabling high-performance gradient coil technology, without the conventional peripheral nerve stimulation (PNS) limitations observed on whole-body scanners.

The unique head-only, asymmetric gradient coil inside SIGNA MAGNUS builds on previous high-performance gradient technology by delivering 300 mT/m peak amplitude with 750 T/m/s slew rate with the same infrastructure requirements as a clinical 3.0T scanner. SIGNA MAGNUS aims to deliver significant new capabilities for clinicians and researchers working in neuropsychiatry, neurodegenerative disease and neuro-oncology, as well as a broad range of structural and quantitative imaging disciplines.

SIGNA MAGNUS enables clinicians and researchers alike to see further and go deeper. With SIGNA MAGNUS, there will always be more to explore. 

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## GE HealthCare collaborates with NBA, NBPA, NGBPU and establishes sports medicine user group

National Basketball Association (NBA), the National Basketball Players Association (NBPA) and the Next Gen Basketball Players Union (NGBPU), in collaboration with GE HealthCare and MedStar Health, have embarked on a longitudinal pilot study of NBA G League players designed to collect data that could help promote player health and wellness and reduce injuries.

As the largest assessment of training and game load on athletic performance across a full professional basketball season, the study monitored musculoskeletal and joint health of NBA G League players from four teams during the 2023-24 campaign.

The study performed prospective, longitudinal assessments on athletes by combining daily use of wearable technologies to provide consistent measures of game and training loads with serial biomechanical, kinematic, and force-producing assessments. Advanced imaging techniques used in the study included ultrasound shear wave elastography, MR equipped with deep-learning reconstruction and image-based muscle analysis by Springbok Analytics. This study features SIGNA™ Premier 3.0T wide-bore MR scanner enabled with AIR™ Recon DL deep-learning-based reconstruction software for fast high-resolution imaging,

and specialized ultrashort-TE T2\* research sequences to identify structural and compositional changes in the knee joint.

To further facilitate collaborations with GE HealthCare imaging users in sports medicine, the company has recently established a Sports Medicine User Group. The vision is to advance imaging innovation in athlete performance, injury prevention and rehabilitation by fostering a vibrant GE HealthCare user community that shares collective knowledge and experiences. The first meeting was held in July 2024 with a focus on muscle DTI. Experts from the University of Wisconsin-Madison Badger Athletic Performance, Emory University School of Medicine Sports Performance And Research Center, Hospital for Special Surgery and Springbok Analytics presented their research and experience using muscle DTI and muscle quantification to examine sports injury and recovery.

Bi-annual virtual meetings will be held with various focused topics, such as ACL injury, cartilage quantification, muscle health, bone health and concussion. To join the GE HealthCare Sports Medicine User Group forum, please register at <https://weconnect.gehealthcare.com/>. You will be notified on latest events and be able to view recordings from past events. 