



The time is now for MR in RT – with BioMatrix

MAGNETOM RT Pro edition for MAGNETOM Sola and Vida

siemens-healthineers.us/mr-in-therapy



The time is now for MR in RT – with BioMatrix

Over the past decade, the adoption of MR imaging in support of Radiation Therapy (RT) treatment planning has increased significantly. As an example, MRI utilization in RT treatment planning in the United States increased from 6 % to 24 % between 2006 and 2018.¹

This growing trend can be contributed in part to the excellent soft tissue contrast of MRI. This can potentially allow not only much more precise target delineation, but also of surrounding organs at risk. Efficiently integrating this additional modality into existing processes can add substantial value to radiotherapy and help advance your institution's clinical capabilities.

The MAGNETOM RT Pro edition for MAGNETOM Sola and Vida is a comprehensive and dedicated MR in RT solution, including a hardware and software package tailored to the needs of RT professionals. With this solution, users can confidently perform MR-simulation for RT planning that is precise, reproducible, and intuitive for any kind of user.



- 1 LAP DORADOnova MR3T laser bridge for a precise patient marking process
- 2 RT Dot Engine for consistent scan results
- 3 BioMatrix Interfaces, touch panels for fast and easy patient positioning
- 4 Ultra-high density coils for more accuracy, flexibility, and speed
- 5 Dedicated RT positioning equipment from leading partners for proper patient immobilization
- 6 BioMatrix Sensors capture patient's respiratory signal automatically
- 7 BioMatrix dockable table with eDrive assistance and AutoDocking for effortless patient navigation



Support precision in radiotherapy with MRI intelligence

MR scanner

The top-of-the-line 70 cm Open Bore systems MAGNETOM Sola (1.5T) and MAGNETOM Vida (3T), the first MR scanners with BioMatrix technology, address the challenges of patient variability for RT treatment planning. BioMatrix truly personalizes MRI and increases precise, reproducible imaging for more efficient RT planning, monitoring, and follow-up. Excellent patient access with the 70 cm Open-Bore

design, a large Field of View, and trendsetting imaging applications enabled by the core technologies Tim 4G and Dot, make the difference in image quality and efficiency. The BioMatrix Dockable Table with eDrive speeds up your workflow by enabling the patient preparation outside the MR exam room, freeing up the space to allow other patients to be scanned simultaneously.



Scan patients consistently in the treatment position

RT positioning packages

In order to provide precise and reproducible patient positioning, the MAGNETOM RT Pro edition offers dedicated hardware for high-quality MR imaging in the treatment position. To fully utilize MR imaging capabilities for RT treatment planning, we partner with leading companies in the RT market (Qfix², CIVCO², and Orfit²) to provide flat couch top overlays, coil bridges, and positioning as well as immobilization devices which are compatible with all MAGNETOM RT Pro edition scanners.

MR compatible laser bridge

The optional LAP DORADOnova MR3T² Laser Bridge is an external laser system, supporting virtual simulation of patient marking with laser light at the MR system. For high accuracy and reproducibility the marked position is shifted to the center of the scanner when using the RT Dot Engine, so that there is no need for the additional use of the laser of the MR scanner.

Coils

The MAGNETOM RT Pro edition for MAGNETOM Sola and MAGNETOM Vida comes with a wide range of coils which provide excellent image quality in the treatment position. Thanks to their ultra-high coil-element density, the new BioMatrix and UltraFlex coils provide an increased SNR and high acceleration factors that can save considerable time. All coils ensure excellent signal-to-noise ratio for brain, head/neck, and body imaging when immobilization devices are in place. In addition, extended cables provide more flexibility when it comes to coil positioning.



Rely on intuitive and dedicated RT workflows

RT Dot Engine

The RT Dot Engine provides a comprehensive package specifically addressing the requirements of MR imaging in Radiation Therapy. Designed to enable consistent data acquisition and geometric integrity, the RT Dot Engine provides automated protocols to guide and support the user in the acquisition of suitable RT planning images. The RT Dot Engine includes dedicated imaging protocols for brain, head and neck, and pelvis. The protocols are optimized for spatial integrity of the acquired images and contain some of the following features:

- Automatic distortion correction for improving spatial integrity
- Automatic axial image reconstruction enabling all data to be directly processed in RT planning software
- Laser quality assurance to maintain high accuracy in positioning

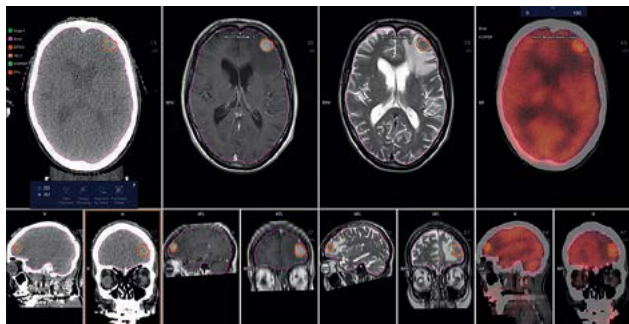
The RT Dot Engine provides guidance on set-up and planning of an exam, as well as guides the radiation oncology staff through the scan.

Applications

Siemens Healthineers offers a variety of optional imaging applications which are tailored to address some of the main challenges in radiation oncology. Techniques like WARP³, our unique FREEZEit, Compressed Sensing GRASP-VIBE⁴, and RESOLVE help maintain geometric integrity of the acquired data and deal with typical sources of image artifacts.

syngo.via RT Image Suite

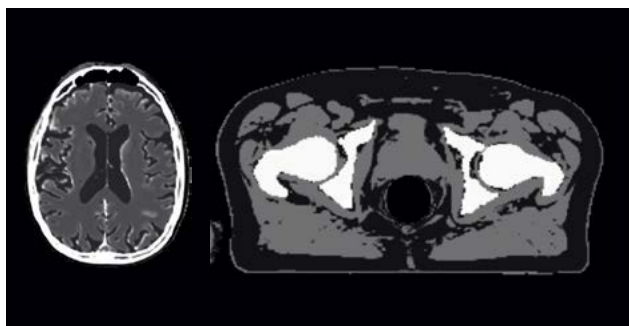
syngo.via RT Image Suite is a dedicated RT software solution, enabling advanced multi-modality image viewing, registration, and target contouring. Designed and developed for Radiation Oncology professionals as a user-friendly work aid to make simulation, image assessment, and contouring easier and better integrated in the clinical routine, syngo.via RT Image Suite eases what you do daily while also offering capabilities that go beyond the current standard.



syngo.via RT Image Suite

Synthetic CT – MR-only radiotherapy planning

While MR provides excellent soft-tissue imaging, CT imaging is still essential as it provides electron density information for dose planning which MR images cannot deliver. As a result, many institutions have to adapt their RT treatment planning workflow, in which patients are normally scanned on both imaging modalities. This makes the workflow more complicated and challenging in regards to image co-registration. With Synthetic CT⁵, Siemens Healthineers provides an application that allows you to perform an MR-only radiotherapy planning workflow for brain and pelvis. As part of the RT Image Suite, Synthetic CT derives a CT-like image from a series of MR sequences which can be used for dose calculation, all without the need for a CT scan.

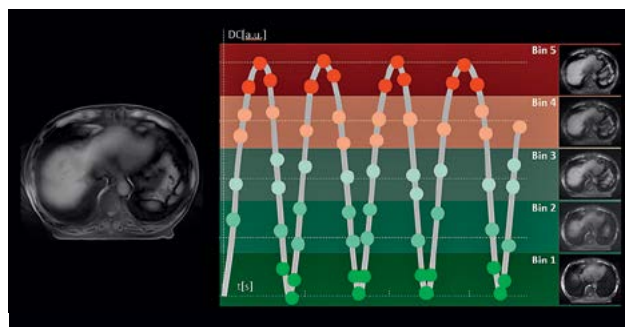


Synthetic CT – MR-only radiotherapy planning

4D MRI – RT Respiratory Self-Gating

In order to address the issue of patient-induced breathing motion in imaging for RT planning, Siemens Healthineers is proud to present 4D MRI – RT Respiratory Self-Gating⁶. The brand-new MRI technique allows you to capture organ motion in the abdomen and thorax with excellent soft tissue contrast and automatic respiratory phase sorting during the entire acquisition time, all without the need for external respiratory devices or surrogates. This allows for clear target delineation and surrounding organs at risk at different phases of a patient's respiratory state for potentially more precise dose planning in abdomen and thorax.

- 4D MRI is a free-breathing, non-contrast, 3D radial acquisition technique
- Images are automatically binned, or sorted, into separate discrete phases which correspond to a patient's distinct respiratory motion states
- Allows precise tumor delineation in the abdomen and thorax at each phase of the respiratory cycle
- Increases accuracy in target delineation as well as delineation of organs at risk in abdomen and thorax, areas in which MRI can be particularly compromised due to patient induced respiratory motion



4D MRI – RT Respiratory Self-Gating

At Siemens Healthineers, our purpose is to enable healthcare providers to increase value by empowering them on their journey toward expanding precision medicine, transforming care delivery, and improving patient experience, all enabled by digitalizing healthcare.

An estimated 5 million patients globally benefit every day from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics, and molecular medicine, as well as digital health and enterprise services.

We are a leading medical technology company with over 170 years of experience and 18,000 patents globally. With more than 48,000 dedicated colleagues in 75 countries, we will continue to innovate and shape the future of healthcare.

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The information in this document contains general technical descriptions of specifications and options as well as standard and optional features, which do not always have to be present in individual cases.

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For accessories, please visit: [siemens.com/medical-accessories](https://www.siemens.com/medical-accessories)

¹ IMV Medical Information Division – 2018
Radiation Therapy Market Summary Report.

² The information shown herein refers to products of 3rd party manufacturers and thus are in their regulatory responsibility. Please contact the 3rd party manufacturer for further information.

³ The MRI restrictions (if any) of the metal implant must be considered prior to patient undergoing MRI exam. MR imaging of patients with metallic implants brings specific risks. However, certain implants are approved by the governing regulatory bodies to be MR conditionally safe. For such implants, the previously mentioned warning may not be applicable. Please contact the implant manufacturer for the specific conditional information. The conditions for MR safety are the responsibility of the implant manufacturer, not of Siemens Healthineers.

⁴ Compressed Sensing GRASP-VIBE for other regions than liver is not for sale in the U.S. Intended Use: Compressed Sensing GRASP-VIBE (GRASP = Golden-angle Radial Sparse Parallel MRI) is intended to be used in dynamic and/or non-contrast liver examinations to support patients who cannot reliably hold their breath for a conventional breath-hold measurement.

⁵ The data acquisition protocols for Synthetic CT are available on XA11 software with MAGNETOM RT Pro edition for MAGNETOM Sola and MAGNETOM Vida.

⁶ 4D MRI – RT Respiratory Self-Gating is available on XA11B software with MAGNETOM Vida. Prerequisites are RT Image Suite and the Deformable Registration license

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