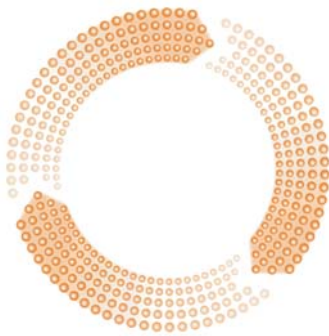**SIEMENS**

Dot

See what our customers around the world are saying about Dot.

siemens.com/dot

Dot

The next movement in MRI. Are you part of it?

Dot
The next movement in MRI

In 2003, Siemens introduced Tim® (Total imaging matrix), setting the benchmark for integrated coil technology.

In 2004, Siemens brought you the first 70 cm Open Bore system, setting the benchmark for patient comfort.

In 2009, Siemens set the benchmark and began the latest movement in MRI with Dot® (Day optimizing throughput), redefining productivity.

Now, the movement continues, with Dot available on more systems and with more intelligent Dot engines to choose from.

Dot. The next movement in MRI. Are you part of it?

MAGNETOM systems with Dot integration

Systems equipped with Tim 4G and Dot.

MAGNETOM Skyra –
Transforming 3T productivity.

- Dot integrated
- Tim 4G integrated
- Top-of-the-line 70 cm 3T

MAGNETOM Aera –
Transforming 1.5T economics.

- Dot integrated
- Tim 4G integrated
- Top-of-the-line 1.5T

MAGNETOM Spectra –
It's the key to 3T.

- It's quality. Unchallenged.
- It's usability. Unlimited.
- It's patient care. Uncompromised.

Dot now available for new systems or as an upgrade for installed systems.

MAGNETOM Verio –
Proven 3T clinical imaging.

- Tim+Dot integrated
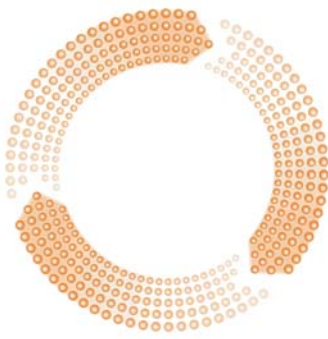- Proven openness
- Proven performer

MAGNETOM Avanto –
The landmark in 1.5T imaging.

- Tim+Dot integrated
- Landmark in technology
- Landmark in applications

And the movement continues ...

Dot is personalized.

Dot allows for uniquely tailored, optimized scans adaptable to the patient or clinical question, and according to your standards of care.

Optimized exam strategies

Dot provides predefined and adjustable exam strategies to help you quickly adapt your protocols according to the patient's condition or clinical indication.

Dot speaks your clinical language

Customize strategies to your clinical practice and your standards of care.

Consistent, high quality exams

High quality exams are easily reproduced, even when conditions change.

"By customizing Dot, we have been able to enhance several of our protocols. For example, the Dot Decisions functionality in Abdomen Dot [Engine] has enabled us to schematize and simplify these protocols. With Dot, we can now ensure our examinations are far more reproducible and of excellent quality.

Arnaud Lambert
Technologist
*Imagerie Médicale Saint Marie, Osny, France*

"The best part of the Cardiac Dot Engine for me is a combination of all the features ... put these together and it results in a very shortened examination time.

Matthew Benbow
Superintendent Radiographer
Royal Bournemouth Hospital, Bournemouth, UK

Dot is guided.

Dot provides step-by-step user guidance for greater efficiency, improved image quality and consistency. With the Dot Display[1] located on the scanner, patient data and positioning information is provided right where you need it for accurate and fast patient set-up.
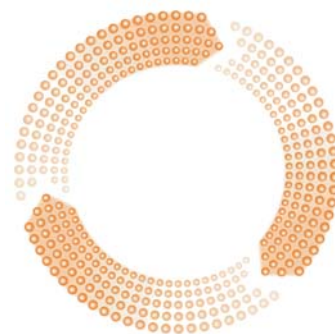
Real time on-board guidance

Dot guides you, intuitively through complicated exams, step-by-step.

Customizable to your standards

Add your own image and text guidance to follow your standards of care.

Integrated decision points

At critical steps in the scanning process, decision points are presented. You can add or eliminate protocols or groups of protocols with just one click, allowing you to react to the clinical situation or changing conditions.

“I am guided through the start of the liver dynamic in an easy and clear way. It helps me achieve the right timing for the contrast medium.”

Sabrina Koch
Technologist
*St. Franziskus Hospital Münster, Germany*

“One of the major benefits of Dot is that it provides us with a relatively easy way to perform slice positioning through a library of images, which guide the user to specific anatomical points by means of landmarks.”

Romain Olliac
Technologist
Service de Radiologie Polyvalente Diagnostique et Interventionnelle
Hôpital Pitié-Salpêtrière, Paris, France

Dot is automated.

With intelligent workflows customized to your standards, Dot delivers a degree of automation that takes efficiency to a whole new level.
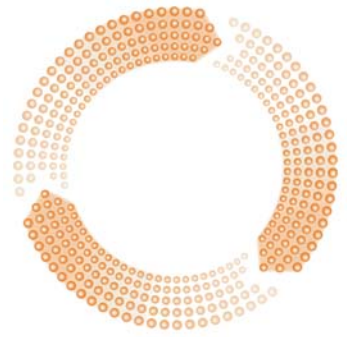
Intelligent, automated workflows

Dot literally helps take the complexity out of MRI exams – even for demanding examinations such as cardiac and abdomen.

Timing is synchronized

With AutoVoiceCommands and Auto Bolus Detection Dot helps ensure the optimal timing of breathing or contrast timing.

Effortless set-up

Dot links proper protocols and procedures. Automated slice positioning and Inline processing, as well as the instant estimation of Field of View (FoV) are just a few examples of how Dot can help ensure fast and robust scanning.

"Dot has the advantages of an automatic gear box, changing gears is unnecessary, but we stay at the wheel and decide where to drive."

Professor Henrik Michaely, MD
Section Chief Vascular and Abdominal Radiology,
Institute for Clinical Radiology and Nuclear Medicine
University Medical Center Mannheim, Germany
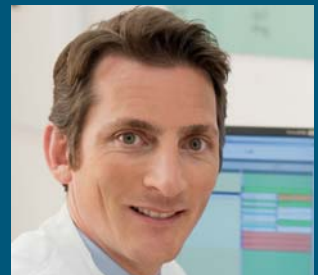
"Cardiac Dot [Engine] allows us to obtain automatic positioning of the main slices necessary to evaluate cardiac function with a high degree of reproducibility."

Professor Philippe Cluzel, MD, PhD
Service de Radiologie Polyvalente Diagnostique et Interventionnelle
Hôpital Pitié-Salpêtrière, Paris, France

Dot engines

The Dot engines are the driving force. Use these Dot engines to leverage the knowledge of your team and configure the engines to meet your specific clinical standards.

> "At our radiology department, for MRI exams of the brain, we standardly use the Siemens Brain Dot Engine, as the automated slice position greatly improves reproducibility."
>
> Jeroen Veltman, MD, PhD
> Radiologist
> ZGT Ziekenhuisgroep Twente, Almelo, Netherlands

> "The main way that Dot benefits the patient is it reduces scan time. So if a routine brain would take say 12, 14, 15 minutes, with the Dot engine, you may be able to reduce that by 2 to 3 minutes, which is 20% of the scan time."
>
> Bob Day
> Chief Technical Officer
> Zwanger-Pesiri Radiology

Brain Dot Engine

For the most commonly performed MRI studies, examinations of the brain, the Brain Dot Engine enables consistent brain imaging regardless of the patient condition – even if conditions change during the course of the exam. Brain examinations are simplified through less user interactions, greater ease-of-use, and patient-specific adaptations.

Optimized MRI brain examinations

The Brain Dot Engine, with guided and automated workflows customized to your standard of care, makes general brain exams easier, more reproducible, and more efficient. Each exam can be tailored to the individual patient.

With just a click of the mouse, you can choose from several exam strategies, allowing for for fast adaptation to different or changing patient conditions. The Brain Dot Engine even offers exam strategies with optimized *syngo*® BLADE protocols to minimize and correct for the effects of motion.

Consistency is key

With AutoAlign Head, the slice positioning is automatically suggested for you – not only for the standard brain examination, but for various indications at specific brain structures, such as the optic nerve or the temporal lobes. Automated positioning contributes not only to increased image consistency across patients, but also in follow-up examinations. In addition, it enables consistent exam durations for easier and more efficient scheduling, thus optimizing patient throughput.

- **Up to 20%[2] higher throughput and faster reading**
- **Reproducible positioning and standardized image quality**
- **Consistent exam duration and more efficient scheduling**

▶   siemens.com/Brain-Dot-Engine

Cardiac Dot Engine

Cardiac MRI is widely regarded as a highly complex examination, but also as one of the most comprehensive diagnostic tools in cardiology. The Cardiac Dot Engine helps combat this multiplicity with exam guidance, step-by-step, to help you achieve consistently excellent results.

From complex to routine

The Cardiac Dot Engine offers several features that help take the complexity out of cardiac MRI exams. Exam strategies can be selected based on the patient's physiological conditions, and all protocols are adapted accordingly.

The new AutoAlign Heart feature makes the localization easier than ever, and gives you the next step in workflow automation with fully automated positioning of 2-, 3- and 4-chamber view and a stack of short axis views. Standard views of the heart are easily generated and can be simply reproduced using different scanning techniques.

Tailor exams to each individual patient

Whether a patient has arrhythmia or limited breath-hold capability, predefined Dot exam strategies are already integrated, and can be adapted to your standards of care. Scan parameters are adjusted to the patient's heart rate and breath-hold capability, and automatic voice commands in the language of choice can be given. The Cardiac Dot Engine also offers different workflows for ventricular function, ischemic heart disease, and myocarditis[3].

Ease of use and workflow automation

Scan parameters are automatically adapted to the patient's condition. The FoV and number of slices are suggested to you by the Cardiac Dot Engine. Cardiac specific layouts are automatically chosen and shown; configured for every step of the exam. All images are automatically displayed in dedicated cardiac image orientations. Automatic functional analysis is done Inline immediately after reconstruction of the last short axis image, and the results can be automatically transferred to the PACS system.

> "Within our environment, we just could not provide a cardiac MRI service without the Cardiac Dot Engine."
>
> *Dr. Russell Bull, MRCP, FRCR*
> *Consultant Radiologist*
> *Royal Bournemouth Hospital, Bournemouth, UK*

> "With the Cardiac Dot Engine, we have been able to bring cardiac examinations into our clinical routine."
>
> *Professor Christoph Bremer, MD*
> *Head of the Department of Radiology*
> *St. Franziskus Hospital Münster, Germany*

> "As a manager of a busy MRI unit, I'm under constant pressure to ensure that the waiting list is kept as short as possible. And, of course, one way to do this is to shorten your examination times, and Cardiac Dot Engine has enabled me to do this."
>
> *Matthew Benbow*
> *Superintendent Radiographer*
> *Royal Bournemouth Hospital, Bournemouth, UK*

- **Up to 50%[2] increase in patient throughput**
- **Consistency in slice positioning for reliable image quality over multiple exams**
- **Ease-of-use, helping bring cardiac MRI into your clinical routine**

▶ siemens.com/Cardiac-Dot-Engine

Abdomen Dot Engine

The Abdomen Dot Engine offers a comprehensive and customizable workflow for examinations of the abdomen. Various features lead to robust and consistent image quality – in particular in comprehensive examinations such as of the liver.

Optimized timing and guidance

The Abdomen Dot Engine guides users step-by-step even through complex exams like liver scans, where correct timing is key. Users are aided with functionalities like Auto Bolus Detection or Test Bolus Timing, where the detection of the bolus is automated or arrival time is calculated for optimized timing of the following scan. Improved timing accuracy produces more consistent scanning results, helps achieve a confident diagnosis faster, and helps reduce the number of rescans.

Fast adaptation to patient conditions

The Abdomen Dot Engine offers predefined exam strategies, which provide a set of protocols to allow for fast adaption to different or changing patient conditions. These strategies can even be adapted during the workflow. One example is the freebreathing strategy, which provides protocols that are triggered by the patient's regular breathing rhythm, allowing free breathing if the patient is unable to hold their breath. This is enabled by the AutoNavigator functionality.

Dot Decisions allow your decisions to be seamlessly integrated into the scanning workflow. For the abdomen, MRCP and Diffusion decision points are offered, which allow the user to add or remove one protocol or a set of protocols with one click.

- Up to 28%[2] better timing accuracy
- Improved timing accuracy for more reproducible results
- Consistent image quality for even complex abdomen examinations

▶ siemens.com/Abdomen-Dot-Engine

> By customizing Dot, we have been able to enhance several of our protocols. For example, the Dot Decisions functionality in Abdomen Dot has enabled us to schematize and simplify these protocols. With Dot, we can now ensure our examinations are far more reproducible and of excellent quality.

Arnaud Lambert
Technologist
Imagerie Médicale Saint Marie, Osny, France

> First I set the ROI [using the Abdomen Dot Engine], and [Auto Bolus Detection] automatically recognizes the contrast medium bolus and starts the scan at the right time with the right breathing commands. So, it helps me achieve the right timing for the contrast medium.

Sabrina Koch
Technologist
St. Franziskus Hospital, Münster, Germany

Knee Dot Engine

MR examinations of the knee are commonly performed in a variety of settings ranging from hospitals to out-patient centers. The Knee Dot Engine is designed to provide efficient and flexible 2D and 3D imaging workflows, while allowing consistent and reproducible image quality.

Adapt and assist

With the Knee Dot Engine, the user can adapt the exam strategy with a single mouse-click, even during the scan in case patient conditions change – for example, speeding up the scan if the patient starts to move. The Knee Dot Engine includes AutoAlign Knee to help ensure consistent slice or volume orientation. This helps you achieve consistent results across your patient population and simplifies your follow-up examinations. Dot guides you through the workflow, step-by-step with image and text information.

With its 3D functionality, the Knee Dot Engine assists the user to dramatically speed the scan and generates 3D datasets for interactive 3D reading, while at the same time providing Inline MPR's for conventional 2D reading. MPR planning is performed during the 3D scan, in a time-efficient manner. After the examination is completed, multiplanar reconstructions are carried out automatically.

Customized for the individual patient. And user.

Dot exam strategies enable the scan to be personalized to the individual patient condition and clinical need. Dot comes with a number of predefined strategies, which can be selected or changed at any time during the workflow. For example, scan times can be shortened if required by the patient's condition. Dedicated Dot exam strategies are available to reduce susceptibility artifacts from MR conditional implants.

- **Knee examination tailored to the patient**
- **More consistent image quality**
- **Speed and ease-of-use for 3D workflows can be dramatically improved**
- ***syngo* WARP for reduction of susceptibility artifacts, such as from MR conditional metal implants**

▶   siemens.com/Knee-Dot-Engine

'' AutoAlign is helpful especially for colleagues who rarely perform knee examinations because the slices are positioned automatically, which saves a lot of time. Furthermore, our knee examinations have become reproducible. ''

Linda Willeke
Technologist
St. Franziskus Hospital Münster, Germany

'' In some pathologies, we need to obtain interexamination reproducibility and to be able to carry out examinations swiftly. In the area of knee pathology in particular, Dot and its AutoAlign function have enabled us to position slices automatically without the need for user intervention. ''

Alexandre Fuchs, MD
Radiologist
Imagerie Médicale Sainte Marie, Osny, France
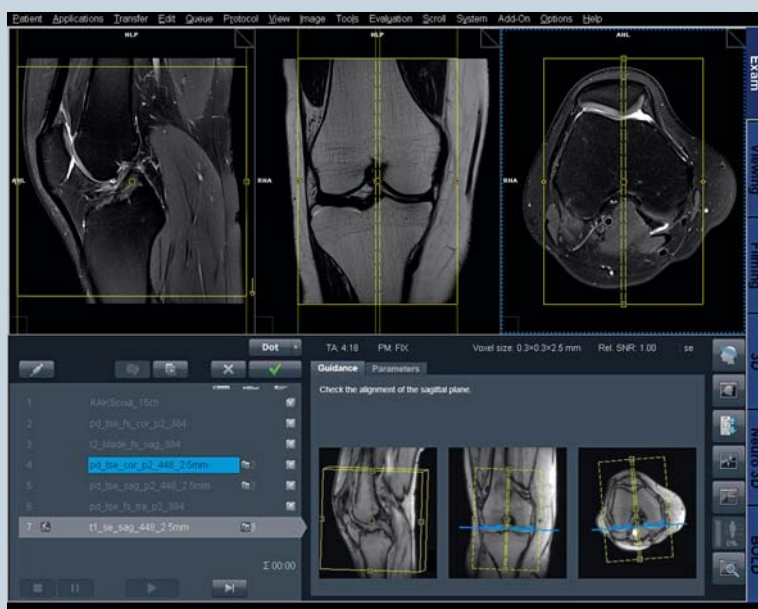
Angio Dot Engine

The Angio Dot Engine helps take the complexity out of MR angiography examinations with user guidance, timing optimization, and workflow automation. The accurate timing of contrast injection and scan start is commonly considered the most challenging part of an angiographic examination. The Angio Dot Engine is designed to empower the user to perform high spatial resolution contrast-enhanced MR angiography.

Timing is everything

The Angio Dot Engine guides the user through angiographic single or multi station examinations by aiding in slice and RoI positioning. Optimal arterial and venous timing can be achieved with help of the test bolus and the resulting automatic calculation of contrast arrival. Bolus timing can easily be adapted to the individual patient and patient's condition.

Automation is the key

The automated calculation of the venous and arterial time curves is visualized in the Guidance View of the Angio Dot Engine. The user is then guided to help synchronize the timing of contrast delivery and scanning. When needed, AutoVoiceCommands are integrated into the scanning workflow, ensuring optimal timing for breathing, while supporting communication with the patient.

- Automated calculation of contrast agent application
- Interactive contrast timing approach eliminates need for cumbersome calculations
- Increased timing accuracy and image consistency

TimCT Dot engines

Siemens' unique TimCT (Continuous Table move) technology and Dot are now combined to advance workflow benefits even further. Achieve large Field of View applications with smooth workflow and superb image quality, taking further advantage of a highly advanced patient table with high positioning accuracy and an RF shielded table drive. Users only have to define the start point and end point of the scan area.

TimCT Angio Dot Engine

Optimal timing of the vascular examination is made possible through fast examination times thanks to the table speed, iPAT compatibility, and the display of arterial and venous timing windows using the test bolus. Test bolus information is fed back into the next planning steps so scan parameters can be adapted to the individual patient and condition. When needed, automatic voice commands support optimal breathing timing and the communication with the patient.

- **Combines integrated continuous table movement with Dot's optimized timing**
- **Up to 30%[2] faster acquisitions for whole-body angio exams**

TimCT Onco Dot Engine

Perform fast and seamless imaging with iPAT, while at the same time achieving excellent image quality. There is no delay or measurement pause during table movement. Customizable Dot features such as predefined exam strategies, step-by-step guidance, and automated voice commands are also integrated.

- **Combines integrated continuous table movement with Dot's dynamic acquisition of upper abdomen**
- **Scan thorax, abdomen, and pelvis in less than 30 minutes[2]**

The latest additions to Dot

Spine Dot Engine

The Spine Dot Engine enables you to simplify your spine workflow by providing tools to reduce exam times, achieve superior image quality, and supports you during reading. It optimizes cervical, thoracic, and lumbar spine imaging for a wide range of patients and conditions, offering personalization with different exam strategies for each.

Optimized cervical, thoracic, and lumbar spine imaging

The Spine Dot Engine provides robust and reliable cervical, thoracic and lumbar spine examinations with guided and automated workflows. It supports the user in achieving reproducible image quality and enhanced ease-of-use. Throughput is optimized by means of spine-oriented exam layouts, automated positioning, automated vertebra numbering, intervertebral disc plane detection, and drop & snap for fast positioning.

AutoAlign Spine and automated vertebra numbering

AutoAlign Spine helps you deliver exceptional reproducibility and robustness for several spine pathologies and norm variances. It takes the individual spine geometries into account for positioning of all spine protocols in the Spine Dot Engine, increasing consistency across patients and through follow-up exams. In addition, the Spine Dot Engine offers a spine-oriented exam layout. It displays all relevant images in an optimized way, while navigating through spine regions. The user is able to specify layout content according to specific preference.

- **Complete spine examinations with ease and fewer errors**
- **Fast and standardized scanning**
- **Consistent and robust image quality**
- **_syngo_ WARP for reduction of susceptibility artifacts, such as from MR conditional metal implants**
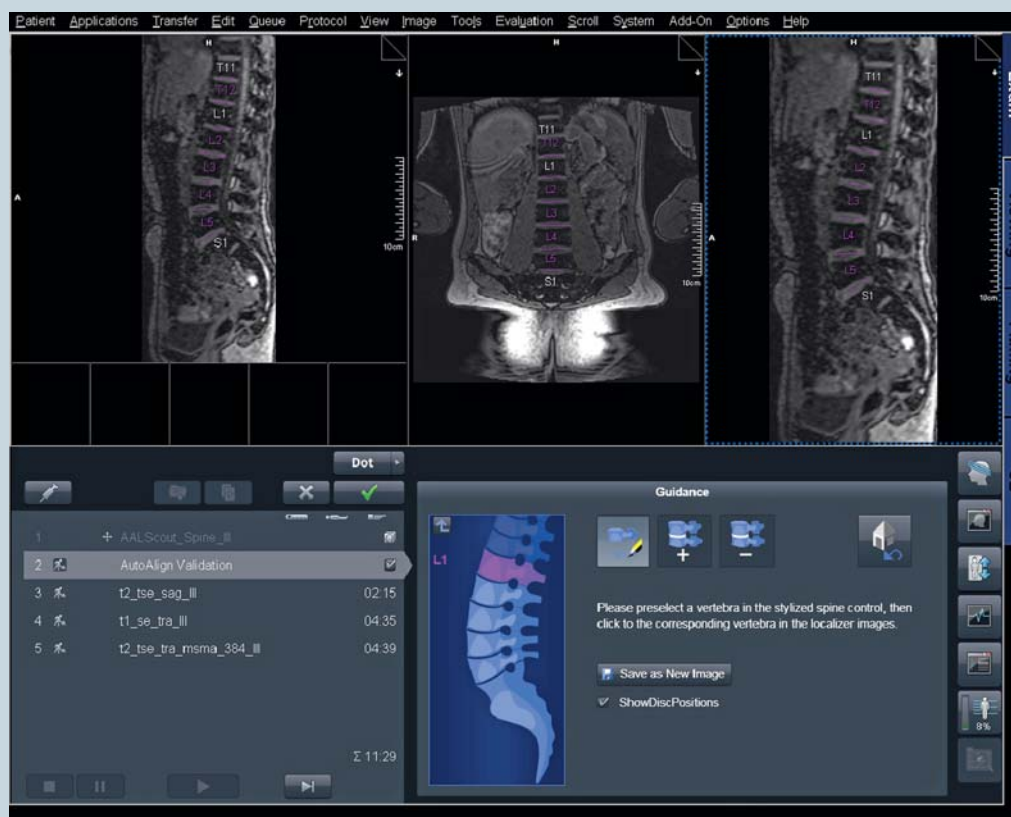
Available for MAGNETOM Aera …

… and MAGNETOM Skyra

Breast Dot Engine

Through patient personalization, user guidance and exam automation, the Breast Dot Engine takes breast exams to the highest level of efficiency, reproducibility, and image quality.

Fast adaptation to clinical question or patient conditions

There are different predefined Breast Dot Engines for lesion and implant evaluation, as well as biopsy procedures, allowing you to personalize the scan to the clinical question or patient condition. The Breast Dot Engine was designed to be used as an out-of-the-box solution.

Automation of contrast timing is designed to avoid operator related errors that may hinder diagnostic outcomes. Intelligent frequency handling helps ease implant imaging. Individual frequency adjustment is made possible by the Breast Dot Engine, allowing you to adapt your scans for different types of breast tissue, such as fatty or glandular tissue, unilateral small silicon or saline implants. Step-by-step guidance with images and text is integrated, and both images and text are easily configurable by the individual user. In case of a biopsy, the Breast Dot Engine immediately displays the calculated coordinates at the Dot Display right at the MR scanner – right where it is needed. This helps to reduce potential errors and helps to achieve faster results.

Optimal timing of contrast agent

The Automated Bolus Detection functionality of the Breast Dot Engine supports the user in a way that the correct point in time for initiation of the dynamic protocol is reproducible, and the initiation is adjustable to the physiology of the individual patient.

Adjust to what is needed

In addition, an AutoFoV functionality is provided. Based on localizer data, automatic segmentation is performed, which allows the estimation of the optimal FoV (entire FoV for both breasts, right or left breast, breast with chest). The user can individually predefine which parameters should be automatically adjusted for every protocol. According to your standards of care, the decision about whether time or slice thickness should remain constant can be made by the user.

- **Faster planning**
- **Higher standardization**
- **Less errors**

Available for
MAGNETOM Aera …

… and MAGNETOM Skyra

Large Joint Dot Engine

The Large Joint Dot Engine optimizes scans by proposing the most appropriate protocols for the individual patient according to the exam strategy chosen. It helps ensure reproducible image quality and streamlines large joint examinations to the greatest extent.

Increase consistency and productivity

The Large Joint Dot Engine expands on the Knee Dot Engine, allowing Dot to cover all large joints – shoulder, hip, and knee with the goal of enabling a consistent workflow for all large joint MRI exams. For knee, hip, and shoulder exams, 2D and 3D workflows are available.

Step-by-step user guidance with images and text is integrated and easily configurable by the user. Workflow automation with AutoAlign and AutoCoverage helps to ensure consistency across patients and in follow-up examinations. The Inline MPR tool uses the position information from the AutoAlign algorithm and can be easily configured to automatically generate any required 2D images from high resolution 3D acquisitions. The Large Joint Dot Engine also offers optimized shim settings for outstanding image quality of both hip joints.

Exam strategies for patient personalization

Personalize your scans with dedicated exam strategies to best fit the needs of individual patients and their clinical indications: Optimize your image quality by choosing an exam strategy for compensation of motion artifacts or reduction of susceptibility artifacts, originating e.g. from MR conditional metal implants.

- **Increased consistency and productivity in large joint exams**
- **Personalized exams for the individual patient conditions**
- **Standardized examination and reproducible positioning with Auto Coverage and AutoAlign**
- *syngo* **WARP for reduction of susceptibility artifacts, such as from MR conditional metal implants**

Available for MAGNETOM Aera …

… and MAGNETOM Skyra

Tim+Dot

Together, they redefine productivity.

Benefit from further productivity and imaging advantages by harnessing the power of Tim+Dot – Siemens' direct response to today's demanding world of healthcare economics in the world of MRI. Tim technology has made fast, flexible, and accurate scans the rule, rather than the exception. It's the ultimate acquisition technology that unlocks imaging power like never before.
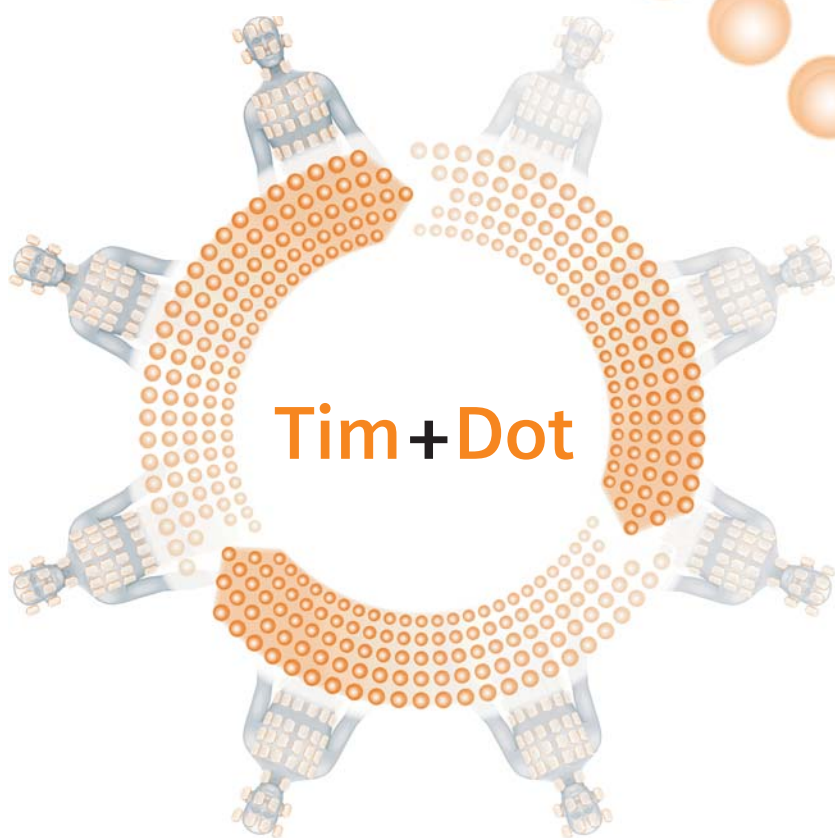
Tim+Dot

The integration of Tim+Dot, two groundbreaking technologies, transforms your MRI experience with up to 50%[2] higher productivity. Delivering consistent, robust images by personalizing the exam for each patient.

Now you are empowered with the tools you need to provide excellent care, more efficiently and consistently than ever. To optimize use of all critical resources 24/7. The result? Productivity improvements across various aspects of the clinical and business day.

Up to 50% higher productivity.

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