

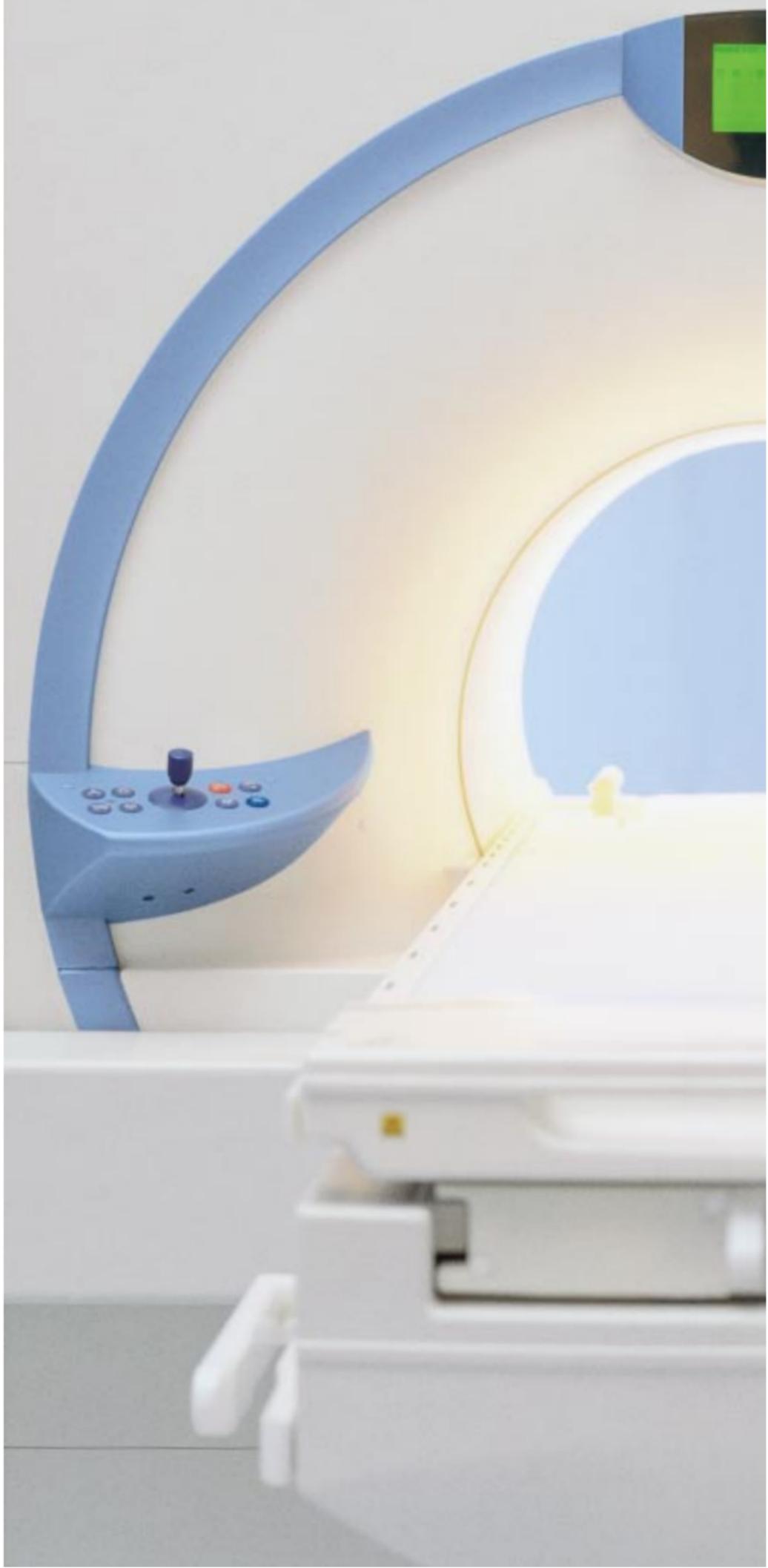


MAGNETOM Harmony [Maestro Class]
The New Degree of Perfection

SIEMENS
medical

Harmony

Maestro Class



MAGNETOM Family

The Perfection of Care

The aim of Siemens MR is the perfection of care. To create products and services that improve the quality of life of all persons who come into contact with them. We do this by caring for the health of the patient, caring for the quality of the user's work – and caring about the owner's profit.

syngo

Siemens is the leader in cross modality common sense! *syngo*® is a comprehensive computer platform engineered for medical imaging that runs on the majority of Siemens medical products.

Different modalities use common intuitive icons to initiate shared tasks such as patient registration, imaging, 3D reconstruction, etc.

All tasks and applications within your workflow are covered either with, or at your system: from patient registration, image acquisition, viewing, and post-processing to filming as well as archiving. The web-based patient record, for example, provides quick access to important patient information. As an alternative, you can view lab results at the console without time-consuming telephone calls to the ward.



Harmony

Maestro Class

Maestro Class

is in

***syngo* – a console to feel comfortable with**

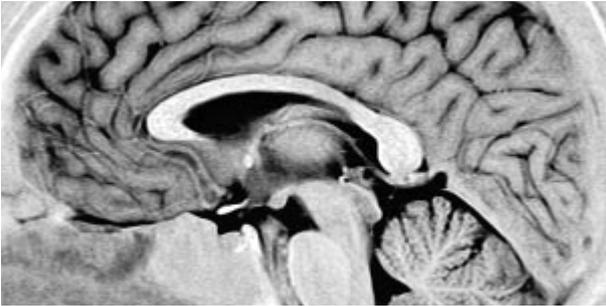
- Task Cards – for structured workflow
- Image Focus – images from all task cards can be processed simultaneously
- Automated Scan Programs – predefined protocols account for most of your daily routine, however, they may be easily adapted
- Flexible Parameters – offer more control over parameters that affect contrast and signal-to-noise ratio
- *syngo* Scan Assistant – a standard feature that immediately displays conflicting parameters and provides the technologist with a range of acceptable values

www.SiemensMedical.com

intelligence

Maestro Class thinks with you!

MAGNETOM® Harmony with Maestro Class automates routine processes, making them faster and simpler, giving you more time for the essentials, your patient and diagnosis.



increased speed

Maestro Class saves time!

MAGNETOM Harmony with Maestro Class puts you in the driver's seat of the best balanced MR system. It combines ultra-fast imaging, cost-effectiveness and powerful clinical performance. MAGNETOM Harmony makes this all possible with one of the strongest gradient systems, latest imaging techniques, high-speed computers, and high-quality RF technology that work together perfectly.

innovative applications

Maestro Class is setting standards!

Always a step ahead! MAGNETOM Harmony with Maestro Class addresses the most complete range of applications from clinical standard to high-end applications with a broad variety of tissue contrasts. Take, for example, a comprehensive brain, spine and body exam with our revolutionary IPA™ coil concept, whole body MR angiography, spectroscopy, and more. Cost effective and with high patient comfort.

Siemens Medical Solutions: the Innovation Leader in MR Technology.

Maestro Class – a new degree of perfection in magnetic resonance imaging with a focus on intelligent technology, increased speed and innovative applications.

- < Siemens – the Leader in MR Technology.
Our top of the line hardware is based on decades of R&D experience with homogeneous magnets and precise RF technology.
- < Siemens stands for Innovative System Design.
Patient-friendly design, high-performance gradients and our groundbreaking integrated coil concept, IPA, help you arrive at efficient and comprehensive diagnoses.
- < Siemens is Setting Standards with *syngo*.
We are the first medical solutions provider to offer a software standard for different modalities. *syngo* stands for a common user interface and a common operating system, offering true compatibility.

is in intelligence

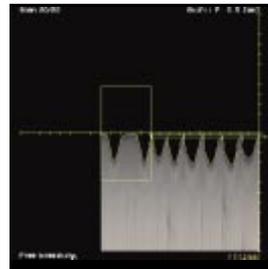
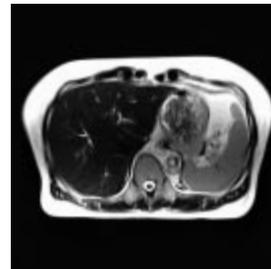
Inline Technology – Processing instead of Post-Processing

The complete exam is finished as soon as image acquisition is completed. Inline Technology uses an intelligent on-the-fly feedback loop to control scanning, reconstruction, and processing. This means motion is detected and corrected in the acquired image, providing you with excellent image quality every single time.

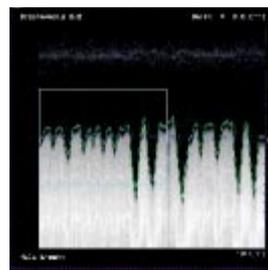
PACE Prospective Acquisition and CorrEction – Motion under control!

1D PACE – Free breathing, the perfect alternative to breath-hold scanning. Detect respiratory motion – accept data only during expiration – and view the results, quickly and easily!

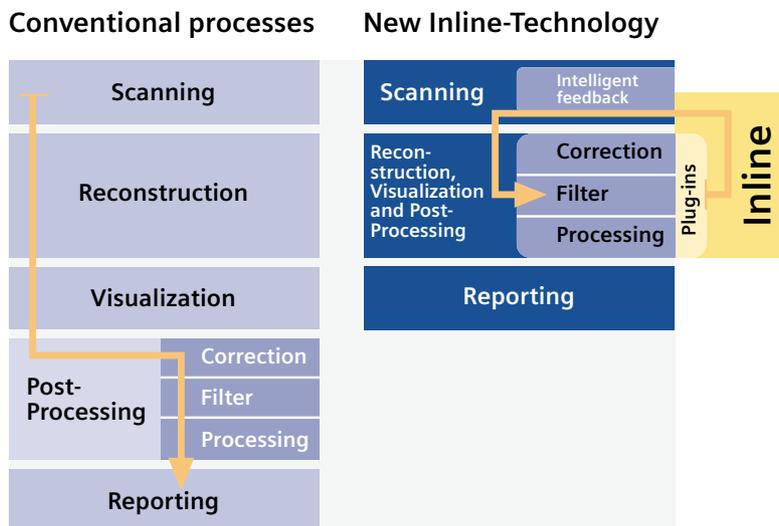
2D PACE – Improve selectivity and precision in abdominal MRI. Automatically align each multi breath-hold – compensate for unwanted patient movement – and obtain fast and reliable diagnostic results.



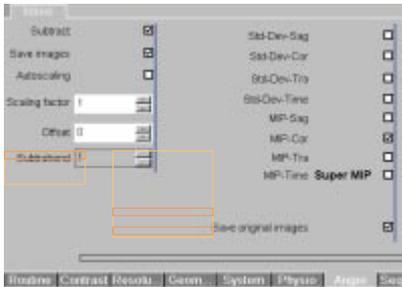
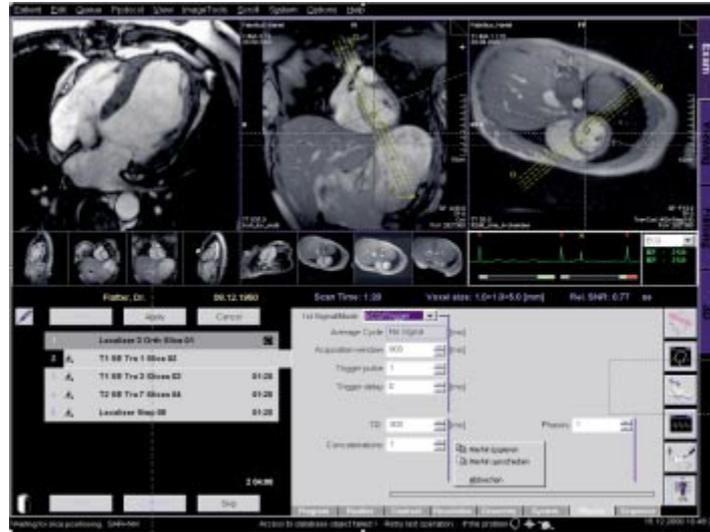
Inline display of diaphragm position define expiration phase to accept data



Inline display of diaphragm position define to accept data



Maestro Class thinks with you!
 MAGNETOM Harmony Maestro Class
 automates routine processes,
 making them faster and simpler.
 Thus you gain time for the
 essentials, your patient and diagnosis.



Contrast-enhanced MRA at your fingertips!

Simplify and automate standard measurement procedures. Acquire MRA data sets, pre- and post-contrast. The data sets are subtracted automatically. The MIP reconstruction is available at the same time.

SuperMIP – automatically provides a scout image across the entire region of interest and lets you accurately plan for additional procedures, allowing you to spend more time with your patient.

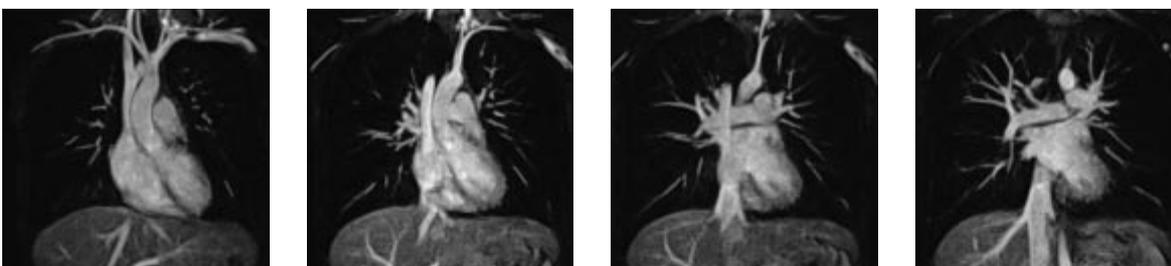
Maestro UI – Your cockpit for dynamic MRI

You are in the driver's seat to optimize your clinical workflow with ease. Create a process, not just for data acquisition, but for immediate access to instant diagnostic results – cost-effectively.

syngo Scan Assistant – Your MR consultant

Do you need to change one of the MR parameters? The *syngo* Scan Assistant visualizes the effect and proposes different parameters in case of conflict. This is the sure way to consistently high image quality.

- Simplify procedures with Inline task cards, e.g. a complete stroke protocol from anatomy, to diffusion, perfusion and function.
- Get a quick overview with Image Stamps – your easy direct access to what you want to see.
- You want to apply exactly the same imaging parameters used for an existing image? Go ahead, use Phoenix, our easy drag and drop function. Insert the image into your measurement queue, and let the system extract all applicable parameters into the measurement card. It's time to start the scan.



Maestro Class

is in increased speed

Maestro Class saves time!

MAGNETOM Harmony with Maestro Class puts you in the driver's seat of the best balanced MR system. It combines ultra fast imaging, cost-effectiveness, and powerful clinical performance. MAGNETOM Harmony makes this all possible with one of the the strongest gradient systems, latest imaging techniques, high-speed computers, and high-quality RF technology that work together perfectly.

The solution to speed up your acquisition times – iPAT

iPAT with Siemens MAGNETOM Harmony means integrated Parallel Acquisition Techniques.

And the term speaks for itself:

- Integrated feature
- Integrated into the MAGNETOM IPA philosophy (Integrated Panoramic Array), our revolutionary coil concept, which enables the use up to 8 independent channels
- Integrated auto-calibration
- Combines the convenience of IPA and IPP (Integrated Panoramic Positioning) for many applications

iPAT is more than just a sequence. iPAT with Siemens has the flexibility to approach each clinical demand differently. It allows for specific answers to specific needs achieved at high image quality in the shortest time possible.

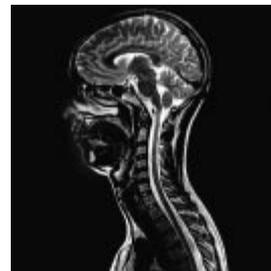
iPAT increases patient throughput as well as patient comfort and delivers excellent image quality.

PAT factor 2 is standard!

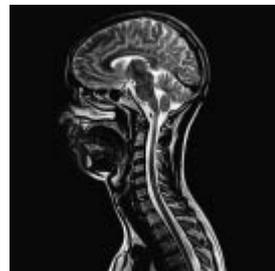
With MAGNETOM Harmony a PAT factor of 2 is standard. iPAT is fully compatible with the unique Siemens IPA coil concept.

What are the benefits of iPAT?

- Increased patient comfort – shorter breath-holds during abdominal imaging result in shorter acquisition times.
- More diversified patient load – comfortable, short breath-hold times allow a greater range of patients to be examined than ever before.
- Higher temporal resolution – in both cardiac and abdominal MRI, e.g. dynamic 3D VIBE liver imaging or cine cardiac imaging.
- Less blurring artifacts – shorter measurement times ensure less blurring anywhere in the body.
- Improved diagnostic confidence – shorter measurement times, higher resolution and less distortion artifacts result in higher image quality with high reproducibility.



without iPAT; 1:04 min, 512



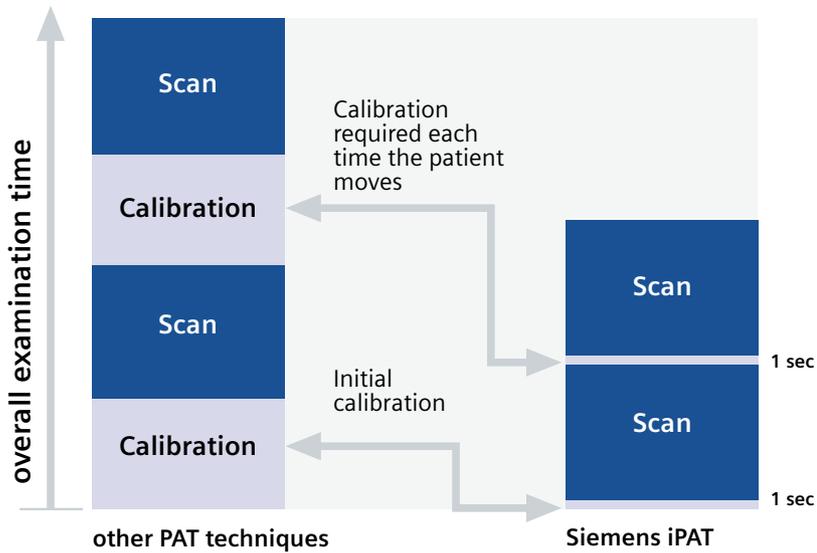
with iPAT; 36 s, 512



without iPAT; 1:40 min, 512



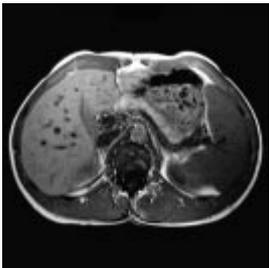
with iPAT; 52 s, 512



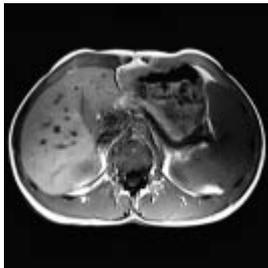
Computer power

MAGNETOM Harmony comes with a dual Pentium 4 based host processor and a single Pentium 4 based Panoramic Recon Image processor, providing ultimate reconstruction speeds of up to 1299 images/sec (256² FFT, 25% rec. FoV).

Up to 5 data sets can be acquired, processed, and reconstructed simultaneously. Our high performance computer power allows real-time image calculation parallel to scanning. The result: higher patient throughput and increased productivity.



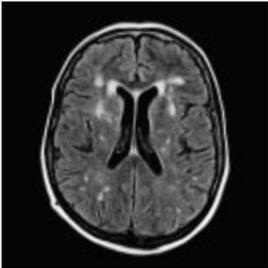
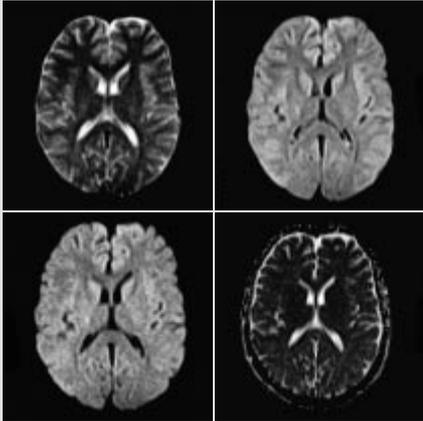
without iPAT; 24 s



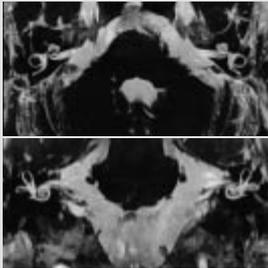
with iPAT; 13 s

is in innovative applications

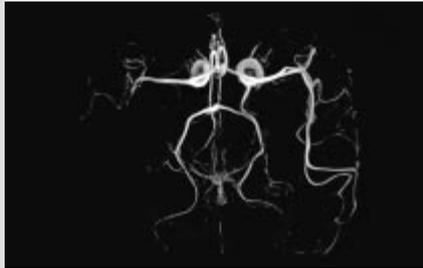
High patient comfort, optimized workflow, and complete anatomical coverage. Combine up to 4 coils of the Integrated Panoramic Array (IPA) coil concept for optimized image acquisition. Use the Integrated Panoramic Positioning (IPP) with automatic table feed and remote patient positioning for easy handling. With a single coil set up you get excellent brain and spine images as well as a complete abdominal study. All this without the need to change coils or to reposition the patient.



- **High-resolution images** with varying contrast levels provide for perfect anatomical images with excellent visualization of pathological tissue.



- **3D CISS** provides sub millimeter resolution T2 weighted imaging e.g. of the inner ear. MIP (Maximum Intensity Projection) is used for 3D post-processing.

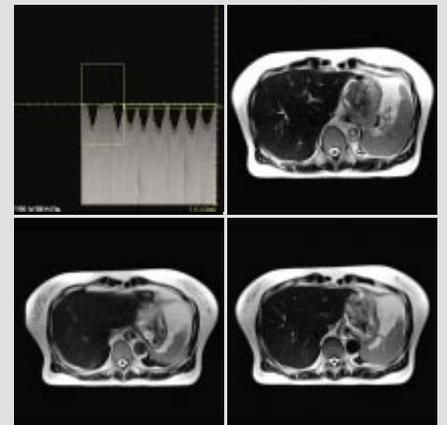


- **Diffusion-weighted MRI (DWI)** is highly sensitive to early cerebral ischemia (within the first 30 minutes to 6 hours).
- **MR Angiography** is an easy add-on to display vessel details.

Maestro Class is setting standards!

Always a step ahead! MAGNETOM Harmony with Maestro Class addresses the most complete range of applications from clinical standards to high-end applications with a broad variety of tissue contrasts. Take, for example, a comprehensive brain, spine, and body exam with our revolutionary IPA coil concept, whole body MR angiography, spectroscopy, and more. Cost effectively and with high patient comfort.

with iPAT; 52 s, 512



■ **Spine imaging with iPAT**

Cut your acquisition times in half compared to conventional imaging times using iPAT together with MAGNETOM IPA coils.

■ **MR Myelography**

Easy add-on, non-invasive examination of the spinal cord to display the nerve origin.

■ **3D VIBE** (Volumetric Interpolated Breath-hold Examination) for 3D dynamic imaging of the abdomen with isotropic voxels. High spatial resolution.

■ **MIP for free!** Click the MIP button and obtain vessel information in every phase of dynamic parenchymal imaging without additional contrast media.

■ **MR Cholangiography**

Non-invasive pathological evaluation of the biliary and pancreatic system, presenting the ducts, millimeter-sized stones, and minimal dilatations.

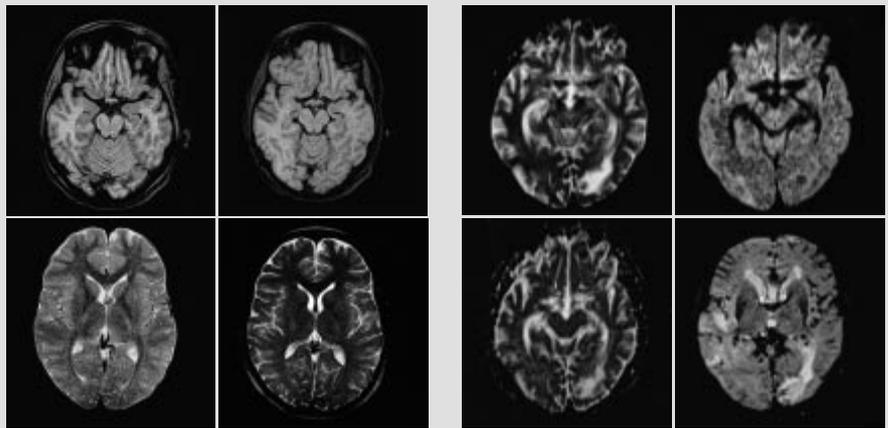
■ **2D PACE**

Multi-breath-hold 2D PACE with HASTE for strong T2-weighted imaging. You get all the information you need about the liver, bowels, fluid, lesions, as well as biliary and pancreatic duct in no time at all.

is **in**novative applications



- Easy patient set-up with highest patient comfort.

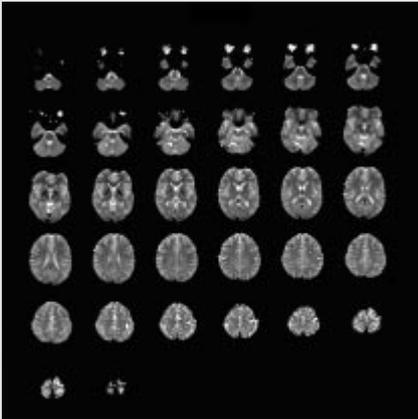


- Ultra fast imaging techniques such as 3D segmented EPI and HASTE provide excellent resolution and a large variety of contrast with contiguous slices and full coverage of the brain.
- Diffusion-weighted MRI (DWI) in combination with perfusion-weighting may be used to predict the severity of the stroke as well as the level of expected recovery.
- The ADC map (Apparent Diffusion Coefficient) helps to estimate the age of stroke lesions. Calculate ADC maps automatically with Inline Technology at the end of the scan.

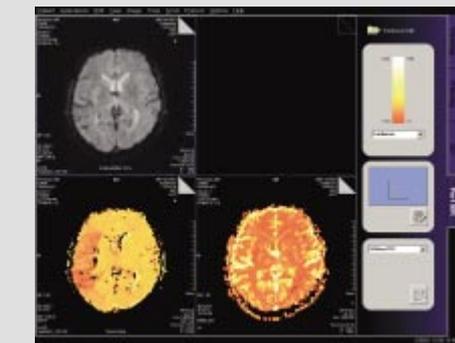
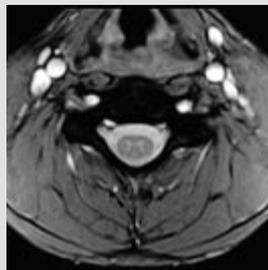
Maestro Class is setting standards!

Use the latest MAGNETOM innovations for advanced neurological MRI, such as segmented EPI, diffusion, and perfusion, as well as functional MRI (BOLD).

Neuro MR provides high-contrast images, including the finest anatomic details for diagnostic speed and confidence. Use IPA, IPP with automatic table feed and remote patient handling, and increase patient throughput cost-effectively.

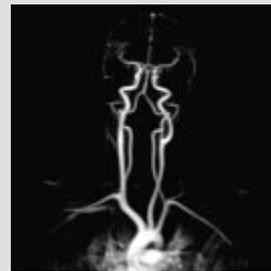
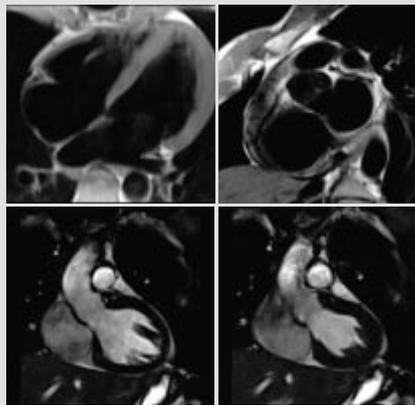
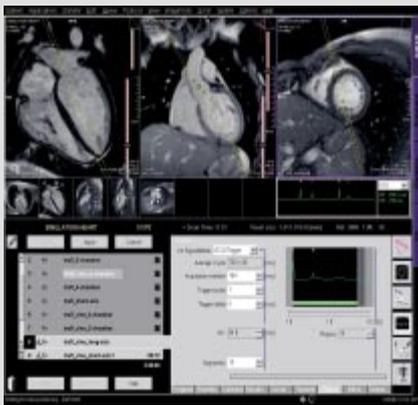


MOSAIC images to display one acquired volume at a time e.g. BOLD imaging



- Parameter map calculations, such as Time-to-Peak or relative MTT (Mean Transit Time) are performed automatically using Inline Technology.
- Without patient repositioning you can acquire high resolution neck images or a whole spine study.
- MEDIC (Multi Echo Data Image Combination) T2*-weighted imaging with high signal-to-noise ratio. Reduced flow artifacts.
- Restore for increased T2 contrast in less time, especially helpful in spine imaging.
- Spine Imaging
High resolution, a large variety of contrasts and full coverage with greatest possible patient comfort – these are all standard features of the MAGNETOM Harmony. Get a whole spine 50 cm Field-of-View study or look for details with smaller FoVs.

is **in**novative applications



- Always on the right track – image stamps may be loaded into the movie function, the post-processing card, or the measurement queue.
- Argus Flow Quantification: vessel and valve flow results are quantified and reported in DICOM format.
- Morphology: Plan oblique anatomical planes easily with 3 point localization. Display your results automatically with the Auto Movie function.
- Short scan times are necessary in contrast-enhanced MRA. High performance MAGNETOM Harmony gradients allow the acquisition of data with minimal sensitivity to flow and motion artifacts.

Fast – reliable – easy-to-use. High speed MRA of high resolution is essential for reliable diagnosis. The high performance gradients of the MAGNETOM Harmony provide the shortest TR and TE parameters – a prerequisite for performing fast and cost-effective MRA studies. All you have to do is inject contrast agent and go.

Easy and completely automatic – high-resolution peripheral MRA from diaphragmatic level to distal vessels

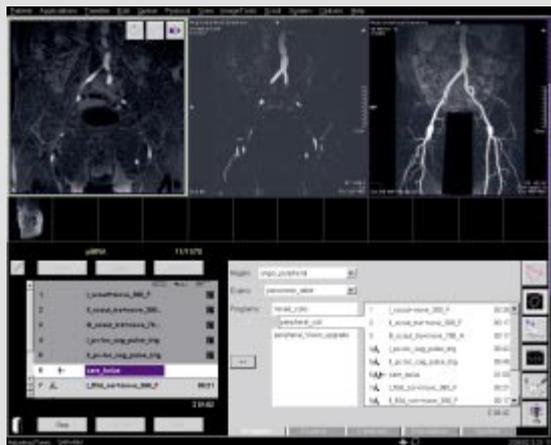
Use the Body and CP Head Array Coil or a multiple CP Array Coil set-up with automatic table feed using Integrated Panoramic Array (IPA) and Integrated Panoramic Positioning (IPP). Your optimized workflow is only a mouse click away.



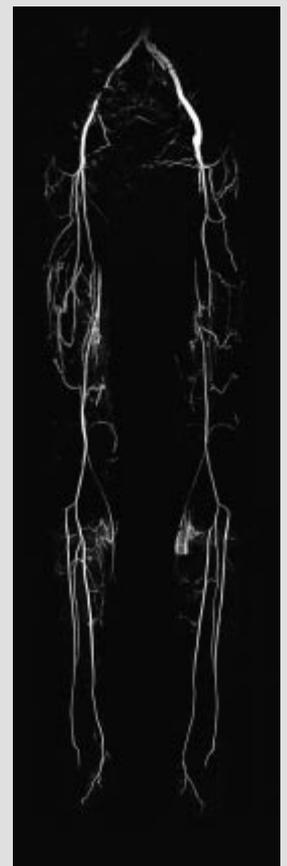
- The Body Coil, CP Head Array and CP Flex Coil combination provide vessel overviews and may be used for post-operative exams.



- Obtain maximum coverage by combining Peripheral CP Angio Array Coil, CP Body Flex Array, and CP Spine Array Coil. This combination is highly suitable for e.g. pre-operative planning. Extend the FoV even further using CP Body Array Extender and Large FoV Adapter.

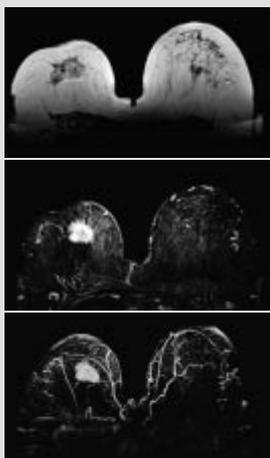
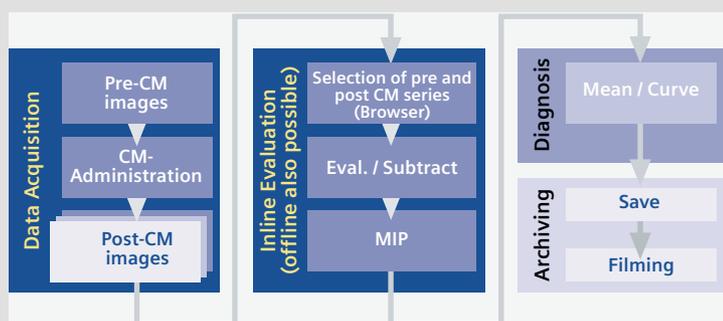


- The scan program for the overall examination is already programmed using the Maestro User Interface. Each measurement can be individually adjusted to the anatomy of the patient.
- Inflow enhancement with Care Bolus is done in real-time. You decide when to start the scan.



- Maestro Class Inline Technology automates the MIP (Maximum Intensity Projection) calculation for each anatomical level.
- Get the results while the patient is still on the table by using subtraction-on-the-fly.

Expand your diagnosis

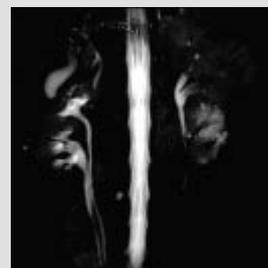


MR Mammography

What is required? High spatial resolution and dynamic information – fast and accurately. The Inline Technology of MAGNETOM Harmony provides a streamlined workflow beginning with patient set-up and ending with the automatic display of the subtracted images.



Combination of the CP Body Flex Array Coil and CP Body Array Extender provide large anatomical coverage without having to reposition the patient. High patient acceptance due to light weight (900 g/coil).



MR Urography

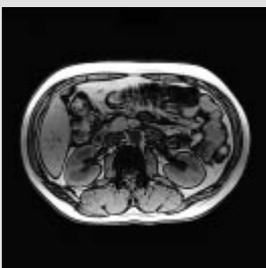
Non-invasive technique performed in less than 2.4 sec. Single-shot HASTE with strong T2 contrast.

Abundance in gradient strength leads to new faster imaging techniques and shorter examination times. MAGNETOM Harmony with Maestro Class sets a new milestone in the expanded use of MR, making it the gold standard for answering many questions in routine clinical gastrointestinal problems.

Get two in one!

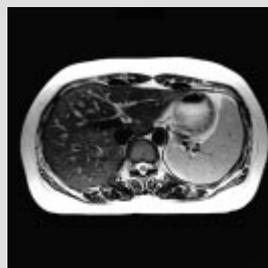


Out of Phase

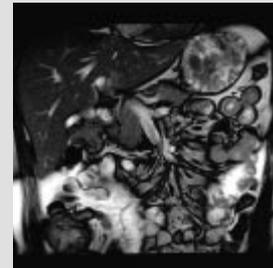


In Phase

Get two in one!
Out of/In Phase FLASH for fatty liver and adrenal tumor imaging.



Excellent image quality, reduced artifacts, within very short exam times with respiratory gating.



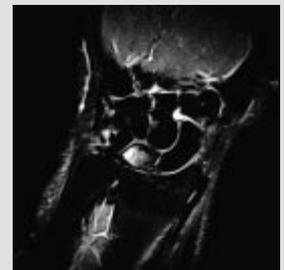
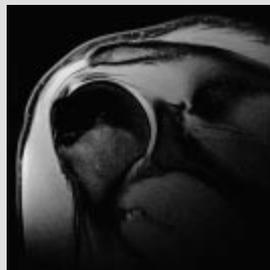
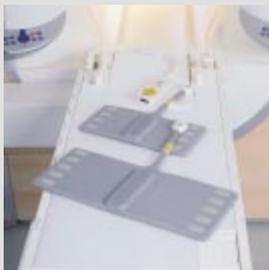
TrueFISP

Subsecond T2 imaging that eliminates artifacts caused by motion. Short acquisition times for high patient comfort.

Patient-friendly

Acquire contrast-enhanced MRA 3D data sets in a 20 s breath-hold. Get high image quality and avoid respiratory motion artifacts.

is **in**novative applications



Easy patient set-up
with highest comfort.

Shoulder –
High resolution and
excellent fat suppression.
*(All images on this page: Courtesy
of Uniontown Hospital, USA)*

Elbow –
Small joint imaging
with contiguous slices
and fat suppression;
1.5 mm slice thickness.

Wrist –
Small FoV with
70 mm FOV for details.
Turbo Inversion pulse
visualizes fluid in the
joint while suppressing
fat signal; 512 matrix,
3 mm slice thickness.

MR Orthopedic Imaging

Fast – precise – complete. High resolution, thin slices, and full anatomical coverage are the focus in orthopedic imaging. MAGNETOM Harmony provides optimized sequences with a large variety of contrasts to visualize joints in detail.



Knee –
High resolution (512 matrix for T1) and contiguous slices for excellent delineation of the ligaments (3D DESS, 1.5 mm slice thickness)



CP coil technology for small FoV and high resolution imaging.



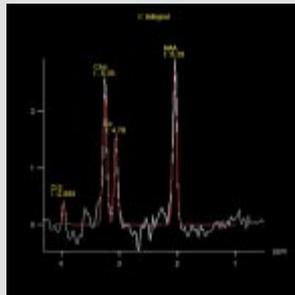
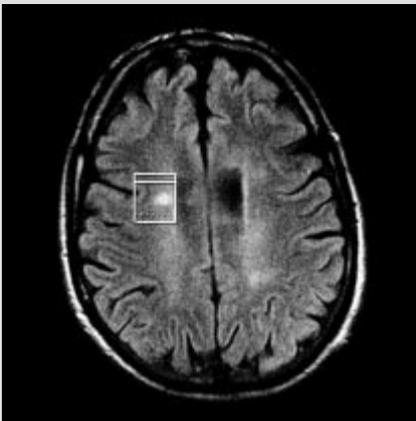
Ankle –
High soft tissue contrast and high resolution with and without fat suppression; 3 mm slice thickness.

Spectroscopy – Automated and Comprehensive



Single Voxel Spectroscopy for proton spectroscopy can be performed using the CP Head Array for image acquisition. Automatic adjustment, measurement and evaluation protocols permit largely automatic spectroscopy measurements.

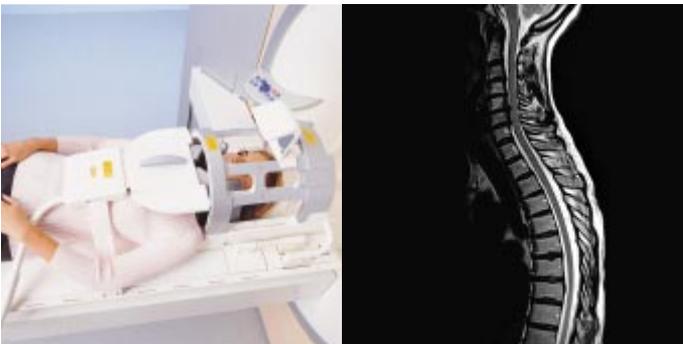
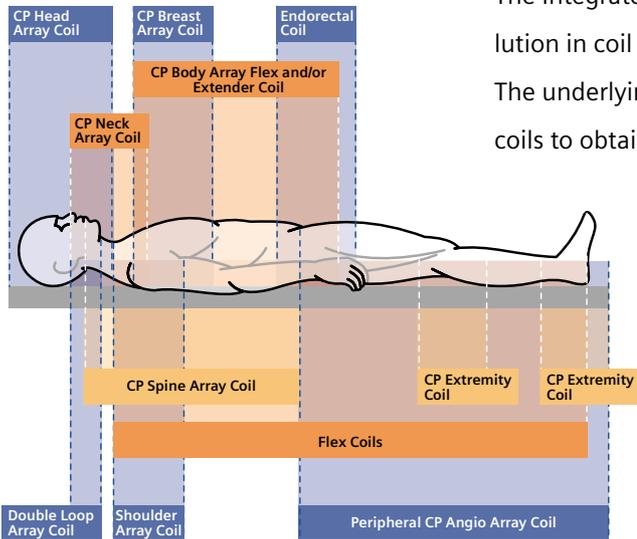
- Easy and efficient “single-button” spectroscopy, with spectra annotation and quantification at the click of a mouse. Keep your focus on the clinical questions at hand.
- Free slice positioning – just use the mouse to tailor both slice position and orientation to your patient.
- Single voxel measurement with Spin-Echo, FID and STEAM techniques.



- Fully automatic data post-processing with instant display for, e.g. spectral maps that show spectra in the selected voxels.
 - Metabolite images show the voxel dependent peak intensities and peak ratios as grayscale or color overlay onto a reference image.
 - Table of metabolites for easy reporting.
- Spectroscopy study of a patient with multiple sclerosis. SVS SE 90, 5 min total acquisition time.
Courtesy of St. Pierre Ottignies, Belgium.

IPA

The Integrated Panoramic Array (IPA) coil concept is the unmatched revolution in coil development as well as a major leap forward in productivity. The underlying philosophy: combine various coil elements from different coils to obtain optimal anatomical coverage including highest image quality.



CP Head+CP Neck+CP Spine=9 coil elements

- Efficient – reduces the number of coils and patient set-up times. Up to 4 different coils may be connected simultaneously.
- Easy handling – coil elements from various coils can be combined for image acquisition.
- High patient comfort – light-weight, open design highly suitable for e.g. cardiac or oncology patients.



- High anatomic coverage – allows for multiple exams covering the largest field of view in the industry. Integrated Panoramic Positioning (IPP) and remote table feed support step-by-step high-resolution imaging of small regions. Table control and coil elements are selected at the main console.
- High image quality due to whole Body CP Array coil design.
- MAGNETOM Harmony receives signals from up to 16 CP coil elements of 4 different coils.



CP Spine Array+
Peripheral CP Angio Array+
CP Body Flex Array=
16 coil elements

EVOLVE

Within EVOLVE you can choose between several options. You can upgrade your system to the latest generation or with the Harmony EVOLVE Package™ schedule regular hardware and software upgrades. The financial alternative to expensive new equipment is EVOLVE.

EVOLVE for MAGNETOM Harmony

We offer complete packages suitable for a number of specific applications. These packages include dedicated application software, coils and expanded system performance.

EVOLVE elevates existing MAGNETOM systems to Maestro Class

EVOLVE lets you upgrade your present generation of MAGNETOM system to Maestro Class performance quickly and cost-effectively. This is certainly the smart way to plan your future budget.

Your subscription to the future – the *syngo* EVOLVE Package

The performance level of computer chips doubles roughly every 18 months. This means that today's leading processors will be obsolete in a few years. Similar time frames are valid for software innovations.

Within the scope of the Siemens Performance TOP maintenance program your hard- and software is upgraded regularly. You will get the image processor and host computer of your *syngo*-based system updated twice over a period of six years.

New software versions will be made available to you. The choice is yours. Depending on your personal requirements you can select one of our specific EVOLVE programs or the complete *syngo* EVOLVE Package.

*In the event that upgrades require FDA approval, Siemens cannot predict whether or when the FDA will issue its approval. Therefore, if regulatory clearance is obtained and is applicable to this package, it will be made available according to the terms of this offer.

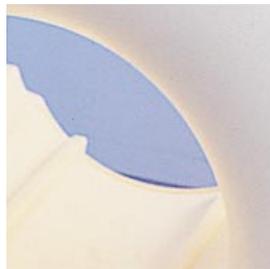
design

High patient comfort enhanced by a comforting environment. The harmonized controls, display, and colored ring as well as the gently curved front panel invite a sense of tranquility and ease.



New design using state-of-the-art materials set a new precedent in system design, far beyond known system configurations. Choose the system that fits your private practice or hospital.

Easy patient positioning with the floating table. It can be lowered to just 45 cm (17.5 in) from the floor and facilitates comfortable access since it moves without a support column. A detachable table allows you to set up patients outside the exam room.



efficiency

Short exam times – Higher patient throughput

MAGNETOM Harmony translates into an approximately 20% increase in daily patient throughput. You are definitely moving into the fast lane with such functions as Inline Technology processing instead of post processing, automatic routines, more reliable results as well as optimal patient ease and system handling.

***syngo* – Learn it once, know it for life**

Your staff costs will be effectively reduced through *syngo*. This Siemens wide software standard reduces long learning phases. This allows you to schedule staff members across modalities and shifts, increasing both productivity and flexibility.

Living large in a minimum of space
MAGNETOM Harmony offers huge advantages in just 30 m² (325 sq. feet). That's the entire system, including the magnet, operating room, and the computer area. A dedicated computer room is not required.



Attractiveness that pays for itself

You'll attract more referring physicians by using the innovative applications of the Maestro Class as your calling card. Consider, for example, body exams with VIBE and iPAT. These reduce exam times not only by half, but also provide information about the vasculature. And here are our one-stop stroke examinations completed in less than 5 minutes, from morphology to diffusion and perfusion. And beyond all that is our patient-friendly system design that adds to the well-being of your patients as well as to the image of your hospital or private practice.

**Would you like additional
information ...**

just go to:

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Acknowledgement:

Uniontown Hospital, USA
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Krankenhaus Fürth, Germany
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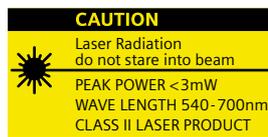
This brochure refers to both standard and optional features. Availability and packaging of options varies by country and is subject to change without notice. Some of the features described are not available for commercial distribution in the U.S.

with *syngo* MR 2002B

The information about *syngo* MR 2002B is being provided for planning purposes. The product is pending 510(k) review, and is not yet commercially available in the U.S.

The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

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