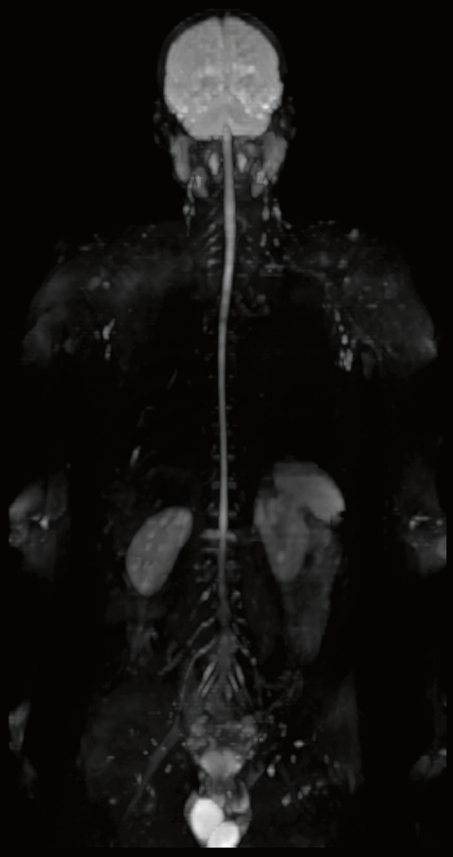
Transform your care delivery

From MAGNETOM Avanto to MAGNETOM Avanto Fit with BioMatrix[1]

siemens-healthineers.com/BioMatrix-Upgrades



1aaaa3751

SIEMENS Healthineers

Is your MAGNETOM Avanto still fit for the future?

Did you know that over one fifth of all MRI scanners in Europe are more than 10 years old and nearly one third in the United States?[2] Maybe your MRI is reaching a critical age as well?

As you know MRI plays an increasingly important role in many clinical fields, e.g., for prostate cancer as first line triage test before biopsy.[3,4] As a consequence, the number of patients that need an MRI scan is constantly growing. Plus, the important gatekeeper that send the patients to you are your referrers. They have high demand towards MRI results and your diagnostic services[5] – and sometimes they have a choice from whom they get it. Beyond that as many others you might be facing severe staff shortages and high time pressure. Nevertheless, often you are asked to still improve your workflow and productivity.

When looking at your existing MRI system and all these challenges in mind, you might ask yourself: Is my current MAGNETOM Avanto still fit for the future?

Contents

Transforming your care delivery

We at Siemens Healthineers want to help you overcome these challenges by offering you an attractive alternative to purchasing a completely new MRI scanner.

With an upgrade of your MAGNETOM Avanto to MAGNETOM Avanto Fit with BioMatrix Technology,[1] you can master the challenges facing MRI today, helping you to expand your services and make the most of your initial investment.

Stay fit for the future by upgrading your MAGNETOM Avanto

Can I still meet the demands of constantly growing number of patients and procedures?

Am I able to keep up-to-date with my current MRI to satisfy my referring physicians?

Can I still improve my workflows and increase productivity?

How much am I able to invest when reimbursements are dropping and costs need to be closely monitored?

More robust and consistent results
for my patients

Improved diagnostic quality
for my referrers

Increased productivity
with innovative workflow & scanning technology

Capitalize on my initial investment
to meet my financial targets

All patients undergoing an MRI are different

Patients have unique, individual characteristics: Some may not be able to hold still. Some may not be able to hold their breathe. Some may experience fear due to noisy scans.

Their different physiologies and anatomies – but also the way we interact with them and with technology – cause unwarranted variations in MRI examinations. These pose significant challenges in MRI: Inconsistent exams. Poor image quality. Increased need for rescans. Unpredictable scheduling. They all can negatively impact the quality and cost of the care you provide. A study showed that movement in MRI exams leads to ~$115k in lost revenue, per scanner, per year.[6]

With an upgrade to a BioMatrix scanner you receive several technologies that help you overcome these challenges for more robust and consistent MRI results for you patients:

BioMatrix Technology
to anticipate motion for high-quality results with BioMatrix Sensors and adapt to challenging anatomies for reliable exams with BioMatrix Tuners.

myExam Companion
to focus on the patient, not the software. By easily adapting scanning strategies to the patient's needs and conditions.

Quiet Suite
to reduce patient's anxiety with up to 96% reduction[7] in sound pressure.

More robust and consistent results for your patients

An upgrade to MAGNETOM Avanto Fit, A BioMatrix System[1] helps you to overcome the challenges that the unique characteristics of your patients impose to your diagnostic results. With the new patient-adaptive BioMatrix Technology, the intelligent guidance from myExam Companion as well as reduced noise from Quiet Suite you can offer more robust and consistent results to your patients. Leading to fewer rescans and higher diagnostic confidence.

BioMatrix Technology

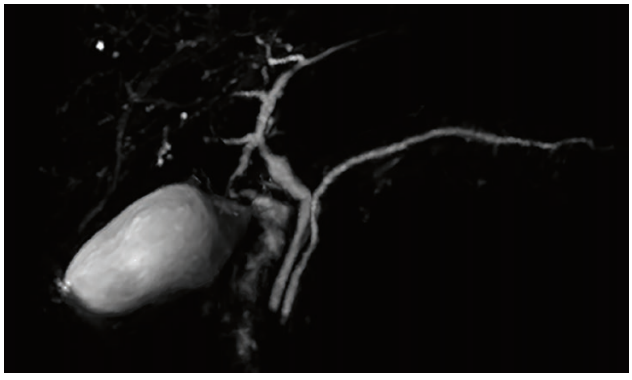
By embracing human nature. Instead of expecting patients to adjust to the technology, BioMatrix automatically adjusts to the patient with three unique pillars:

- Anticipate motion for high-quality results with BioMatrix Sensors.
- Adapt to challenging anatomies for reliable exams with BioMatrix Tuners.
- Accelerate patient preparation for increased efficiency with BioMatrix Interfaces.

Anticipate motion for high-quality results with BioMatrix Sensors

BioMatrix Respiratory Sensors
Respiratory Sensors automatically detect breathing patterns as soon as the patient lies on the table. This provides a simplified workflow as respiratory triggered scans can be performed without additional user interaction.

BioMatrix Beat Sensor
The Beat Sensor is seamlessly integrated into the BioMatrix Body 18 coil. It is designed for automatic cardiac triggering[8] – without the need for ECG leads.



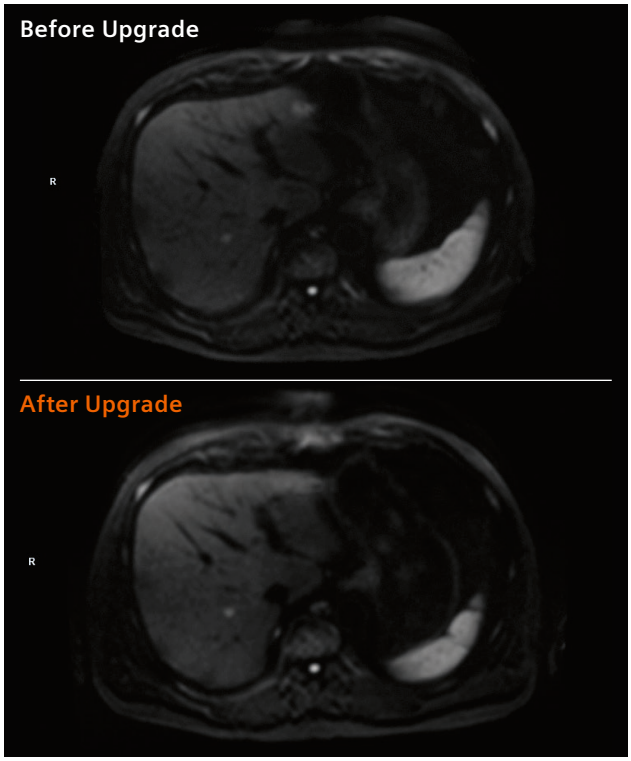
1aaaa3745

Excellent triggered MR cholangiopancreatography (MRCP) using BioMatrix Respiratory Sensor

Adapt to challenging anatomies for consistent results with BioMatrix Tuners

BioMatrix Tuners adapt to challenging anatomies, such as the head/neck area, the spine and the abdomen, for reliable exams. Even for difficult scan regions, our intelligent coil technology consistently delivers excellent homogeneity and fat saturation for every patient, every time.

BioMatrix Tuner SliceAdjust
The BioMatrix Tuner SliceAdjust provides reliable fat saturation for both TSE and DWI sequences, as well as distortion-free whole-body DWI scans. It avoids broken spine artifacts in whole-body DWI for excellent correlation with anatomical scans.



3aaaa3727

More homogeneous DWI with BioMatrix Tuner SliceAdjust

Accelerate patient preparation for increased efficiency with BioMatrix Interfaces

BioMatrix Interfaces simplify how the user interacts with the scanner and the patient, accelerating patient preparation in order to increase quality and improve cost-effectiveness.

BioMatrix Interface Select&GO
The Select&GO touch display enables one-touch positioning with an intelligent Body Model based on Artificial Intelligence. Positioning can be accelerated by up to 30%.[7] Delays due to incorrect positioning can now be avoided.

BioMatrix dockable table with eDrive
The BioMatrix dockable table with eDrive support provides motorized assistance so that even the heaviest patient can be effortlessly moved to and from the scanner.

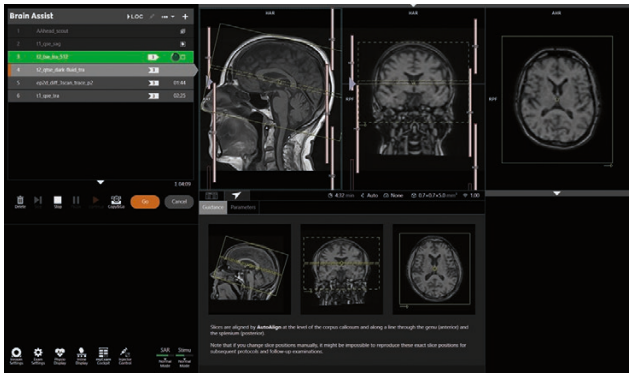
BioMatrix Interface Select&GO

myExam Companion

myExam Companion stands for intelligence that works with you to achieve consistent, reproducible results for the patients. It offers patient personalization, user guidance and process automation via myExam Assists and consistent and intuitive planning via myExam Cockpit. All resulting in reliable examination results tailored to the individual patient's condition and clinical need and in greater diagnostic confidence.

myExam Assist

myExam Companion offers you a suite of customizable workflows allowing the user to flexibly adapt and personalize exams to the patient, get step by step user guidance, and automate MRI exams either "out of the box" or based on the institution's standards. The standard myExam Brain Assist, Spine Assist and Large Joint Assist supports the user in achieving reproducible image quality using automation tools and functionalities incorporated into the program. Other available optional Assists cover ~90% of all MRI exams.[9]

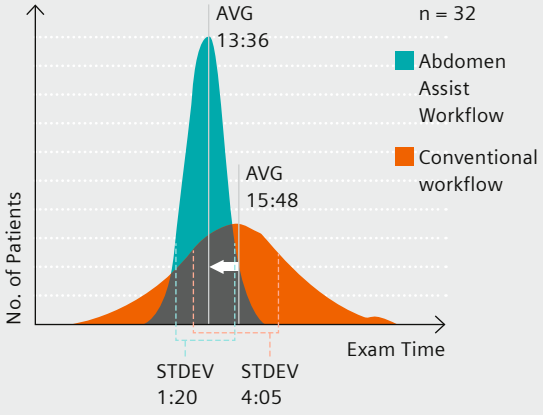


Flexible and guided

Make confidence in scheduling routine for higher patient satisfaction

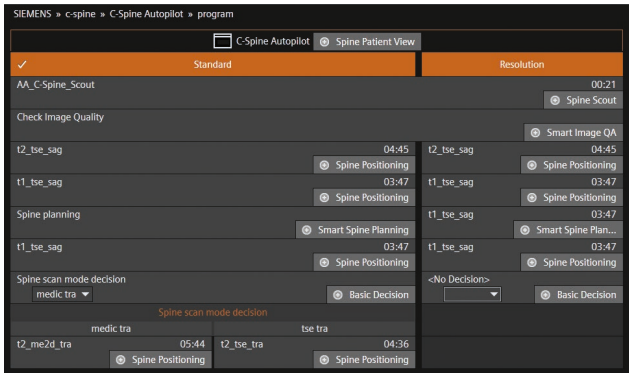
Waiting times have a significant influence on patient satisfaction.[10] But in more complicated examinations scan times can vary, e.g., due to the patient's ability of following commands and laying still. Thus examination might run out of the scheduled time slots leading to overall longer waiting times. A study comparing abdominal exams showed that with the support of the myExam Abdomen Assist and its ability of flexibly adapting exam strategies to the patient's condition exam time variations can be brought to less than 1 minute.[11]

Non-Expert Scanning Times – Liver[11]



myExam Cockpit

One central user interface that helps you to standardize your care. Intuitively configure any protocol and flexibly create your own exam strategies. A study has shown 80% better usability with myExam Cockpit in MRI exam configuration.[12]



Customize intuitively

Quiet Suite

Noise reduction in MRI increases patient satisfaction[13] and thus influences patient compliance and imaging results. Even though advanced noise reduction technologies are present on all our MAGNETOM® scanners, we have continuously strived to develop technologies that will further lower noise without compromising imaging efficiency and quality. With Quiet Suite, we have addressed the root source – sharp gradient switches – to take noise reduction to a new level. Quiet Suite includes QuietX sequences and the inaudible PETRA as well as optimized protocols for neurological and orthopedic examinations.

Experience a broad range of benefits:
- More comfort for your patients through quiet examinations
- Up to 96% reduction[7] in sound pressure for complete neurological and orthopedic MRI exams
- Without compromising image quality or scan time

Hear the difference.
Listen to examples of a examination with and without Quiet Suite.

Link: siemens-healthineers.com/magnetic-resonance-imaging/clinical-specialities/quiet-suite

Referring physicians have high demands towards MRI results

Whether they are internal or external, referring physicians demand excellent MRI images and comprehensive diagnostic statements from you. A study with radiology referrers showed that there are three indicators which drive the satisfaction of referring physicians:[14]

1. Range of examinations offered
2. Quality of technical equipment used for MRI
3. Quality of the images provided

With an upgrade to MAGNETOM Avanto Fit, A BioMatrix System[1] you renew your equipment and receive latest MRI technology that allows you to further improve your diagnostic quality and satisfy your referrers:

Better Image Quality
High-channel Tim 4G coils offer significantly increased SNR.

New Applications
Expand your examination range with many new possibilities for routine as well as emerging clinical applications.

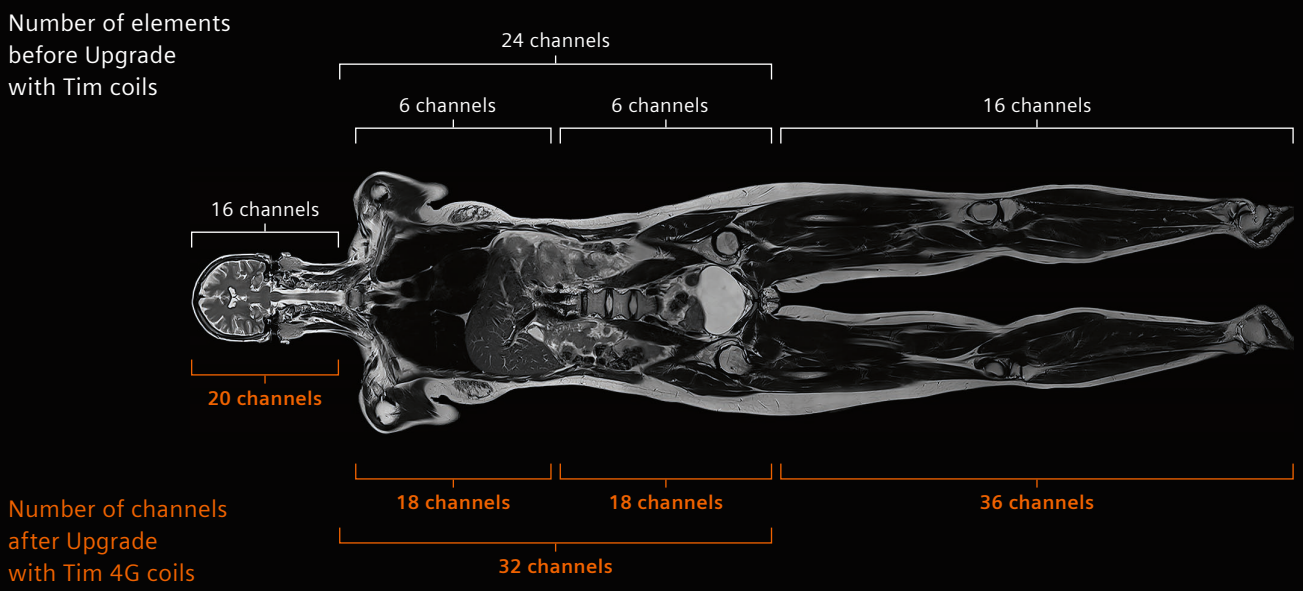
Improved diagnostic quality for your referrers

By upgrading your MRI to MAGNETOM Avanto Fit, A BioMatrix System[1] you renew your MRI equipment and bring it to the latest MRI technology. With high-channel Tim 4G coil technology you can increase the image quality for a broad spectrum of indications. Latest scanning platform *syngo* MR XA-line opens up new clinical possibilities so you can expand your examination range to satisfy your referring physicians.

Better image quality

The new Tim 4G coil technology comes with a completely new design and architecture. The new all digital-in/digital-out design integrates all RF transmit and receive components at the magnet. Optical signal transmission improves SNR by reducing electrical noise and increasing signal detection. The receive path is integrated in the magnet housing. Dual-Density Signal Transfer technology enables ultra-high density coil designs by integrating key RF components into the local coil. All leading to key imaging benefits: Excellent image quality, high patient comfort, and unmatched imaging flexibility.

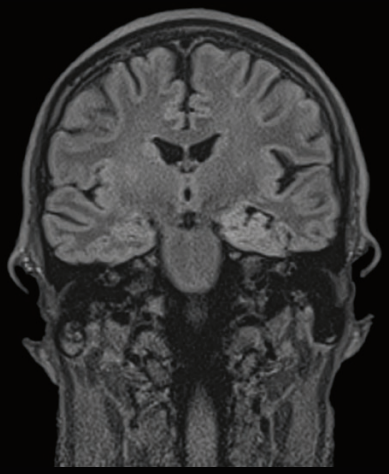
Tim vs. Tim 4G coil element comparison



Increased SNR with Tim 4G

Tim Head Matrix Coil vs. Tim 4G Head/Neck 20 Coil

Before Upgrade

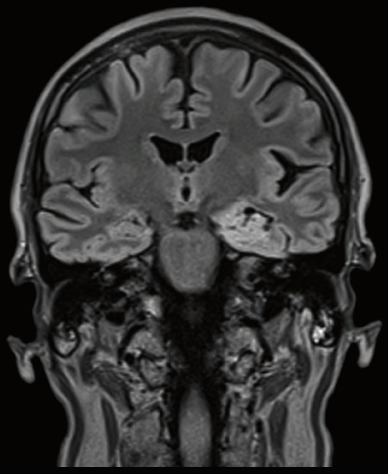


3D SPACE DarkFluid

1aaaa3761

Higher SNR

After Upgrade



3D SPACE DarkFluid

1aaa3762

Shorter scan times after a Fit upgrade

Before Upgrade

Spine imaging with 18 coil elements
TA 2:50 min

1aaaa1840

50% faster imaging

After Upgrade

Spine imaging with 30 coil elements
TA 1:17 min

AvF_030

Images under "After Upgrade" acquired on predecessor MAGNETOM Avanto[fit] with courtesy of Hospital St. Elisabeth, Zottegem, Belgium for brain and IRM Saint Martin, Pessac, France for spine.

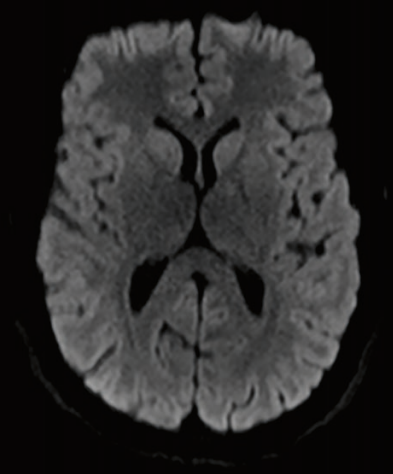
New Applications

MRI plays an increasingly important role in many clinical fields.[15, 16, 17] This is why together with an overall aging population[18] MRI procedures are constantly growing.[19]

With an upgrade to MAGNETOM Avanto Fit, A BioMatrix System[1] you can expand your examination range with many new possibilities for routine as well as emerging clinical applications. At the same time, you can increase the number of patients eligible for MRI with a flexible and comfortable coil portfolio as well as short and easy acquisitions even for the most-complicated exams and under free-breathing.

Neuro imaging
Neurological MRI accounts for ~30% of the total scan volume, still the number of procedures grew by +26% since 2011.[19]

After an upgrade you can now perform:
- High-resolution imaging with Head/Neck 20 coil
- Fast, high-resolution diffusion-weighted imaging with Simultaneous Multi-Slice[20] EPI or RESOLVE
- Robust contrast-free perfusion imaging with a larger coverage and thinner slices with 3D pCASL[20]
- High-resolution 3D SPACE for T1, T2, and DarkFluid allowing visualization of smallest lesions

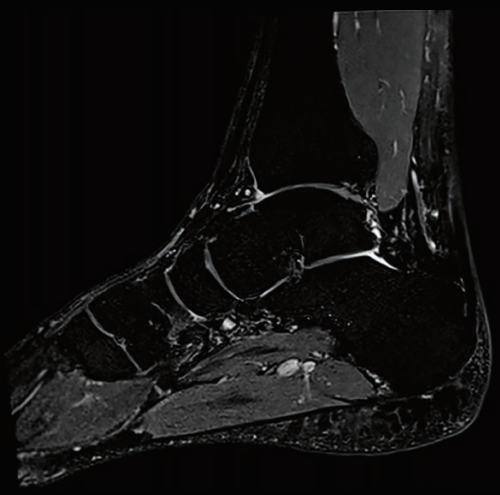


1aaaa2661

Epi DWI; b = 1000; SL 2.5 mm,
in TA 1:29 min using Simultaneous Multi-Slice

MSK imaging
Every day routine is MR imaging of the spinal cord as well as small and large joints. Not only the clinical questions, but also the patients in need of the scans differ a lot.

With the upgrade you can get:
- Very flexible high-channel Tim 4G coil portfolio to accommodate patients with larger swellings or obesity
- Better image quality and reduction of scan time of up to 50% with high-channel coils and Turbo Suite[7]
- Reliable metal artefact[21] reduction in a short examination time to serve growing population of patients with total hip or knee replacement[22]



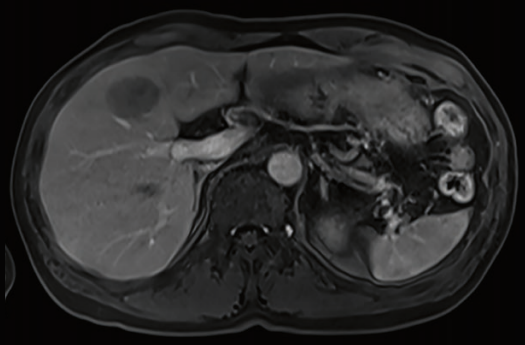
1aaaa3213

PD 3D SPACE in TA 4:33 min for all orientations
with UltraFlex 18 coil

Image under "MSK imaging" acquired on MAGNETOM Sola Fit with courtesy of Jan Palfijn Hospital, Merksem, Belgium.

Liver imaging
Liver MRI is seen as the best abdominal imaging test, but quality is often insufficient due to motion. 9% of all patients are unable to hold their breath for 15 s or more.[23] And, 7% are not able to suspend respiration at all.[24]

After the upgrade you can:
- Reduce required breathhold times significantly to up to 6 s using the acceleration of Turbo Suite Essential
- Overcome timing challenges in dynamic imaging supporting you to uncover additional findings[25] with FREEZEit[20]
- Perform push-button, free-breathing liver dynamics and overcome timing challenges to expand the patient population eligible for abdominal MRI with Compressed Sensing GRASP-VIBE[20]
- Significantly improve fat suppression with DIXON-VIBE[26]
- Non-invasive identification of patients with fatty liver and iron overload at an early disease stage with LiverLab[20]



CAIPIRINHA VIBE in 9 seconds

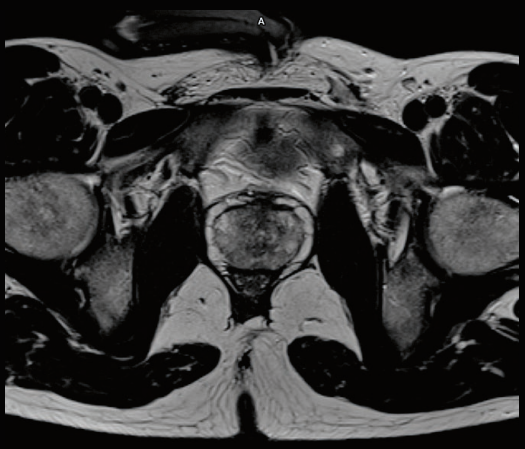
Cardiac MRI
Cardiac MRI plays a growing role in the clinical pathway due to mounting clinical evidence (MR-INFORM).[27]

With the upgrade you can expand this clinical field by offering:
- Automated planning and guided scanning for consistent and fast results with myExam Cardiac Assist
- Pixel-based myocardial quantification, on the fly. With MyoMaps[20] you can better detect global, diffuse, myocardial pathologies (T1 Map)[28] or better depict cardiac edema (T2 Map)[29] and improve early detection of iron overload (T2* Map).
- Motion insensitive and free-breathing exams with Compressed Sensing Cardiac Cine[20]

Realtime Cine Imaging under free-breathing with Compressed Sensing

Prostate MRI
As several multi-center randomized studies have shown clear benefits of mpMRI in the diagnosis of prostate cancer,[30, 31] international guidelines now recommend it as first-line triage test before biopsy.

After an upgrade you can offer to this growing patient group:
- High-quality imaging using high-channel Tim 4G surface coils only Fast imaging protocols
- Improved lesion conspicuity through high-res DWI with RESOLVE or zoomed DWI with ZOOMit[PRO 20]



High-res T2 TSE of the prostate utilizing surface coils only

Images under "Liver imaging" and "Cardiac MRI" acquired on predecessor MAGNETOM Avanto[fit] with courtesy of Aichi Medical University Hospital, Japan (Liver imaging) and of Helios Klinikum Berlin-Buch, Germany (Cardiac MRI).

A clear need for higher productivity

There is an increasing demand for MRI procedures while reimbursement is constantly dropping. So there is a clear need for healthcare providers to boost their productivity in MRI. Even if you might not be facing the need of increasing patient throughput, consistent and short examination times affect patient waiting times and patient satisfaction and therefore have an influence on revenue and referrals.

With an upgrade to a BioMatrix scanner you can increase your productivity by streamlining the entire workflow.

Patient preparation
with BioMatrix Technology

Image acquisition
with innovative workflow technology of myExam Companion and up to 50% faster exams with Turbo Suite[7]

Ready to read results
with GO Technologies

Increased productivity with innovative workflow & scanning technology

With an upgrade to MAGNETOM Avanto Fit, A BioMatrix System[1] your MRI scanner will receive innovative technologies to optimize your entire exam workflow – including one-touch patient positioning, significantly increased scanning time, and ready-to-read results.

See how our technologies help to accelerate the workflow and drive consistency and robustness in spine examinations.

Patient preparation

BioMatrix Select&GO enables exam positioning with one touch on the display – by anyone, on any patient.

Image acquisition and post-processing

Intelligent user guidance and scan assistance of myExam Companion save time.

Turbo Suite allows up to 50% timing savings[7] in scan time.

Reading

View&GO and Dual Monitors[20] allow the user to control scans on the left monitor while checking the results on the right monitor in real time.

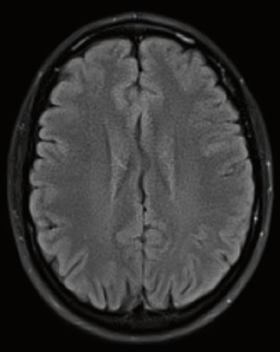
Recon&GO automatically performs postprocessing steps in the background. All in all, radiologists received ready to read results quickly.

Accelerate MR examinations by up to 50%[7] with Turbo Suite

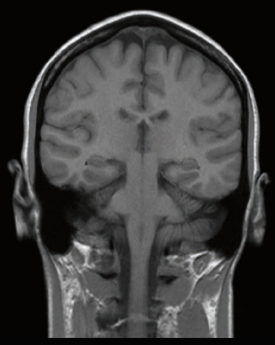
Turbo Suite Excelerate introduces a paradigm shift in productivity with up to 50%[7] time savings, for all contrasts, orientations, and body regions. Dramatically transform care delivery with cutting-edge acceleration technologies Simultaneous Multi-Slice and Compressed Sensing for static 2D and 3D imaging, covering neurological, orthopedic, and body MRI.

Before Upgrade

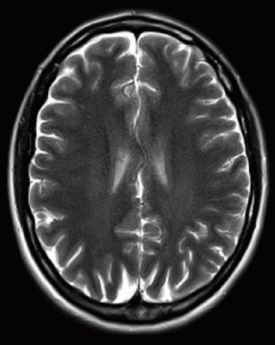
3D TOF
0.7 x 0.7 x 0.7 mm³
TA 4:08 min



T2 DarkFluid
0.9 x 0.9 x 5.0 mm³
TA 1:37 min

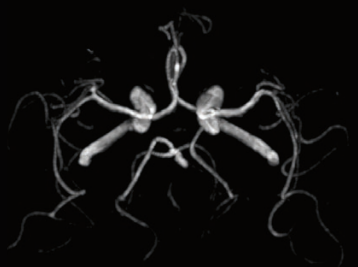


T1 FLAIR
0.7 x 0.7 x 5.0 mm³
TA 1:37 min

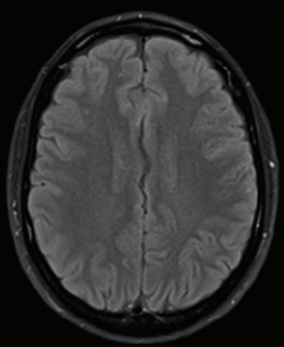


T2 TSE
0.7 x 0.7 x 5.0 mm³
TA 1:10 min

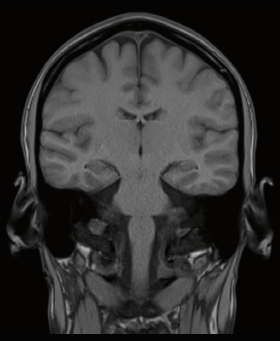
After Upgrade



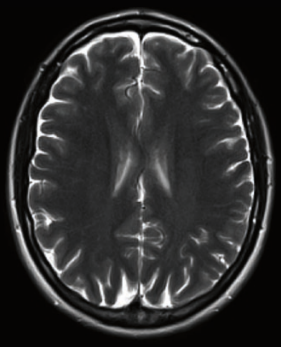
3D TOF, CS 7
0.6 x 0.6 x 0.6 mm³
TA 1:56 min



T2 DarkFluid, PAT 2
SMS 2
0.5 x 0.5 x 5.0 mm³
TA 0:33 min

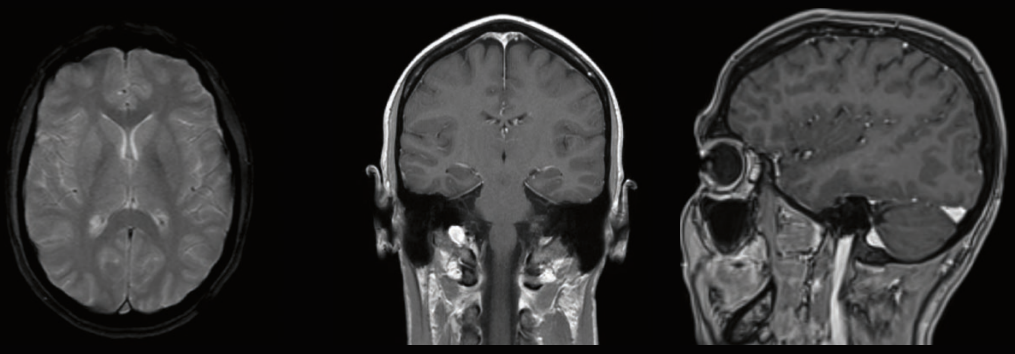


T1 FLAIR PAT 2
0.7 x 0.7 x 5.0 mm³
TA 0:43 min



T2 TSE PAT 2
0.7 x 0.7 x 5.0 mm³
TA 0:49 min

Example of a routine brain examination before and after a BioMatrix Fit Upgrade. High-channel Head/Neck 20 Tim 4G coil with its increased SNR allow the use of higher acceleration factors (PAT). Simultaneous Multi-Slice (SMS) as well as Compressed Sensing (CS) as part of the Turbo Suite Excelerate package further speed up the examination.



1aaaa3761

2D T2 Flair Hemo
0.9 x 0.9 x 5.0 mm³
TA 2:38 min

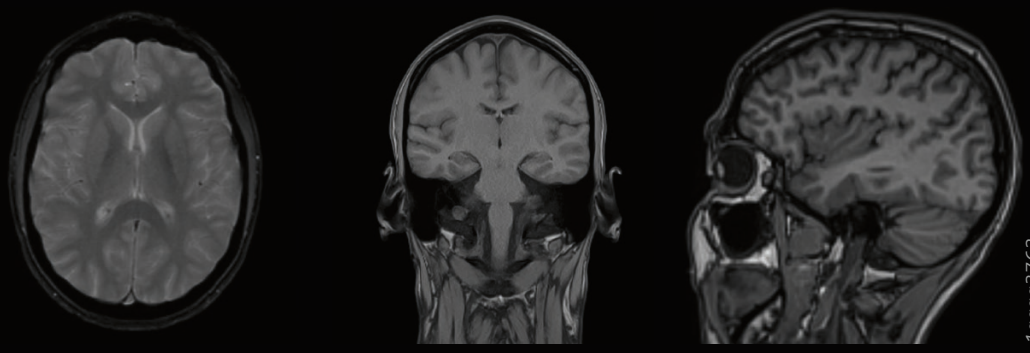
T1 FLAIR Post-CM
0.7 x 0.7 x 5.0 mm³
TA 1:37 min

T1 MPRAGE Post-CM
1.0 x 1.0 x 1.1 mm³
TA 2:52 min

Total exam
16:06 min

37% reduction

in scan time



1aaaa3762

2D T2 Flair Hemo
0.9 x 0.9 x 5.0 mm³
TA 2:28 min

T1 FLAIR PAT 2
0.7 x 0.7 x 5.0 mm³
TA 0:43 min
(w/o CM)

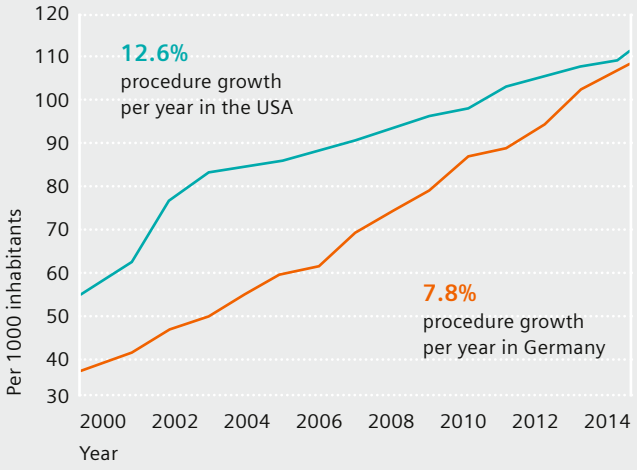
T1 MPRAGE
1.0 x 1.0 x 1.1 mm³
TA 2:53 min
(w/o CM)

Total exam
10:05 min

Capitalize on your initial investment to meet your financial targets

Constantly growing MR procedure numbers and dropping reimbursement are the key challenges in staying profitable.

Constantly growing MR procedure numbers[32]



Dropping reimbursement for medical imaging[33]

30%

drop in reimbursement for Neuro MRI over the last five years in the USA

20%

reimbursement cut for imaging starting 1st January 2018 in Switzerland

By upgrading to a BioMatrix scanner you have a lower overall investment, reduced lifecycle cost and increased earnings potential.

Everything through the door
with no need for rebuilding your current infrastructure

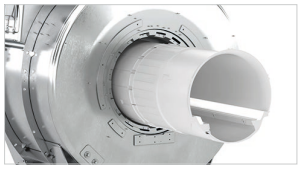
Lower investments
Comparing investment in a new system with cost for an upgrade

Increased earnings potential
with GO Technologies

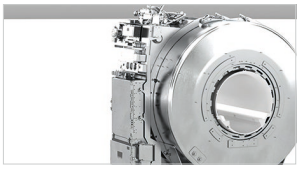
Everything through the door

Upgrading your MRI scanner to the new MAGNETOM Avanto Fit, A BioMatrix System[1] is less effort than you might think. Because you can capitalize on your initial investment: There is no need for rebuilding your current infrastructure. All components fit through your existing doors, and you keep your magnet. Everything is built around it.

Upgrade your system in up to 15 working days



1. Magnet room
The body coil is removed and replaced with a new one.

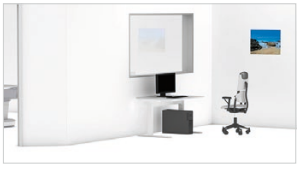


2. New RF design
Installation of new DirectRF (RF all-digital transmit and receive components) directly at the magnet.

3. New covers
All covers are removed and replaced by new ones with two BioMatrix Interfaces Select&GO.

4. New BioMatrix and Tim 4G technology
New BioMatrix and Tim 4G technology, e.g., new BioMatrix table and Spine 32 coil including Respiratory Sensor, Head/Neck 20 with DirectConnect.

5. Technical room
Control and cooling unit cabinets are removed and replaced with new ones. New efficient energy management system installed.



6. Operator's room
All workstations, monitors, and keyboards are removed and replaced by new ones.

7. Licenses
Installed licenses are migrated into new *syngo* MR XA software platform and myExam Companion.

8. Hand over
After installation and image quality test, a comprehensive application training is held to help you get the best out of the new system.

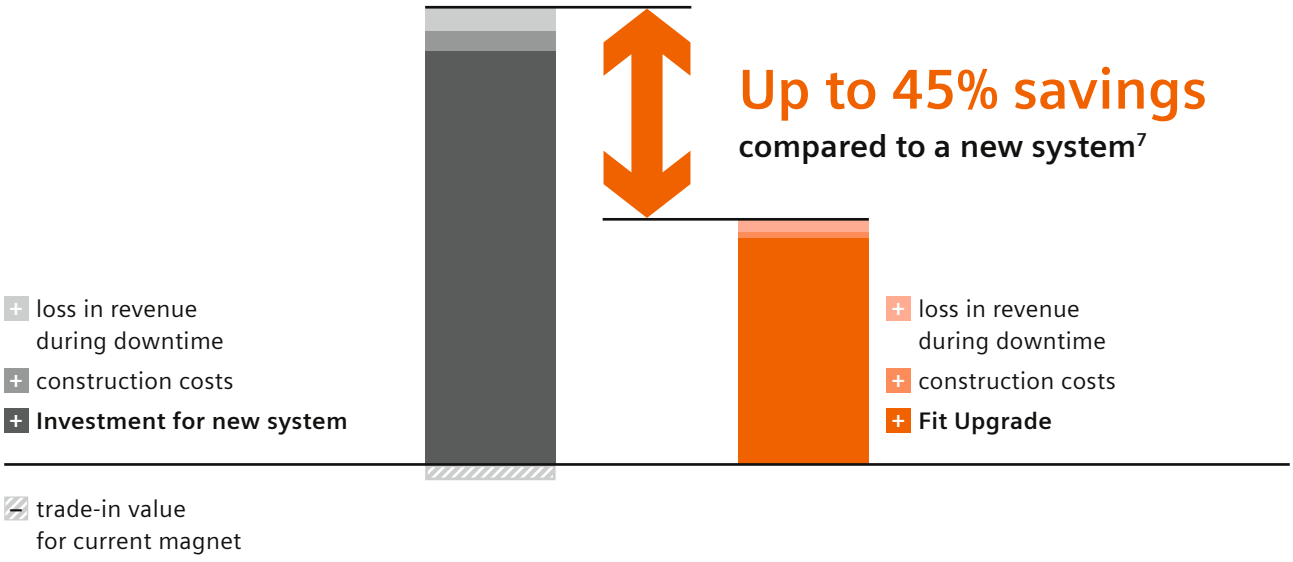
See how few steps it takes to upgrade MAGNETOM Avanto to MAGNETOM Avanto Fit

Investment in a new system vs. cost for an upgrade

If you would invest in a completely new MRI system, you get a certain amount of money back as trade-in for your current magnet. Yet, there is cost for construction work and downtime.

With the upgrade the overall investment is lower. Plus, your potential construction cost and downtime is significantly less.

All in all, you can save up to 45% compared to getting a completely new MRI scanner.



Increased earnings potential

But it's not only about the investment. Also, in the long-run you can save lifecycle costs with a decrease in energy consumption.

Plus, a potential earnings increase due to productivity improvements with shorter scan times, faster patient positioning and streamlined workflows make an upgrade to MAGNETOM Avanto Fit, A BioMatrix System[1] an attractive overall investment.

Lower investment and reduced lifecycle cost

Reduced energy consumption	Efficient energy management with Eco-Power
No rebuilding	Delivery through the door
Fast installation	Only 15 days of installation
Upgrade price	Less investment compared to MRI replacement

Earnings through increase in productivity

Streamlined Workflow	Automation in scanning and post-processing
Faster Patient positioning	30% faster[7] patient positioning with Select&GO
Shorter scan times	Up to 50%-time savings through Turbo Suite[7]

Service

Today, the service experience goes above and beyond pure maintenance. Service can make the difference to your daily operations and help you evolve. This is why we keep innovating our portfolio and team up with you for enhanced efficiency and optimized clinical outcomes. With our services, we are by your side whenever you need us. Always on. Always in touch.

Learn more about the service offerings at
siemens-healthineers.com/customer-services

MAGNETOM Avanto Fit with BioMatrix[1] at a glance

More robust and consistent results
for my patients

- With patient-adaptive BioMatrix Technology
- Intelligent guidance through MyExam Companion
- Effective scan noise reduction Quiet Suite

Improved diagnostic quality
for my referrers

- With better image quality from high-density Tim 4G coils
- Many new clinical possibilities for routine as well as emerging clinical applications

Increased productivity
with innovate workflow & scanning technology

- Up to 50% shorter exams[7] through Turbo Suite
- High efficiency throughout the entire patient workflow with intuitive guidance of myExam Companion

Capitalize on my initial investment
to meet my financial targets

- Short installation time
- No rebuilding costs
- Reduced lifecycle costs through new energy management
- With up to 45% savings[7] compared to a new system

On account of certain regional limitations of sales rights and service availability, we cannot guarantee that all products included in this brochure are available through the Siemens Healthineers sales organization worldwide. Availability and packaging may vary by country and are subject to change without prior notice. Some/All of the features and products described herein may not be available in the United States. Some products are still under development and not commercially available yet. Their future availability cannot be ensured.

The information in this document contains general technical descriptions of specifications and optional features which do not always have to be present in individual cases. Siemens Healthineers reserves the right to modify the design, packaging, specifications, and options described herein without prior notice. Please contact your local Siemens Healthineers sales representative for the most current information.

Note: Any technical data contained in this document may vary within defined tolerances. Original images always lose a certain amount of detail when reproduced.

For accessories, please visit:
siemens-healthineers.com/medical-accessories

[1] *MAGNETOM Avanto Fit with BioMatrix is not commercially available in some countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.*

[2] *COCIR 2019 and IMV Report 2019*

[3] *El-Shater Bosaily A et al., PROMIS group, Contemp Clin Trials 2015;42:26-40; Ahmed H et al., Lancet 2017. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)32401-1/fulltext*

[4] *Kasivisvanathan et al., Precision Study group, NEJM 2018: MRI-Targeted or Standard Biopsy for Prostate-Cancer Diagnosis. https://www.nejm.org/doi/full/10.1056/NEJMoa1801993*

[5] *Kubik-Huch RA, et al: Referrer satisfaction as a quality criterion: developing an questionnaire for measuring the quality of services provided by a radiology department. Rofo. 2005 Mar;177(3):429-34. doi: 10.1055/s-2005-858022.*

[6] *Andre JB. et al. Towards quantifying the prevalence, severity, and cost associated with patient motion during clinical MR examinations. J Am Coll Radiol 2015; 12: 689-695.*

[7] *Data on file. Results may vary.*

[8] *Cardiac Triggering is still under development and not commercially available yet. Its future availability cannot be ensured.*

[9] *Evaluation of system usage based on 2.2 million MR exams, 2013*

[10] *J Am Coll Radiol. 2016 May;13(5):505-9. doi: 10.1016/j.jacr.2015.11.008. Epub 2016 Jan 4.*

[11] *Zhongshang Fudan University Hospital, Fudan, CN, Abdomen Dot Engine Workflow Study.*

[12] *Compared to MR protocol configuration without Dot Cockpit, Usability Study, 2013*

[13] *https://doi.org/10.1016/j.acra.2020.10.012*

[14] *Kubik-Huch RA, et al: Referrer satisfaction as a quality criterion: developing an questionnaire for measuring the quality of services provided by a radiology department. Rofo. 2005 Mar;177(3):429-34. doi: 10.1055/s-2005-858022.*

[15] *Prostate MRI: El-Shater Bosaily A et al., PROMIS group, Contemp Clin Trials 2015;42:26-40; Ahmed H et al., Lancet 2017; Kasivisvanathan et al., Precision Study group, NEJM 2018: MRI-Targeted or Standard Biopsy for Prostate-Cancer Diagnosis*

[16] *Cardiac MRI: https://www.nejm.org/doi/full/10.1056/NEJMoa1716734*

[17] *Whole-Body MRI: Great Britain NICE: European Myeloma Network Guidelines*

[18] *United Nations report by United Nations Department of Economic and Social Affairs, June 13, 2013, New York.*

[19] *IMV 2019 MR Market Outlook Report*

[20] *Optional*

[21] *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.*

[22] *J Bone Joint Surg Am. 2007 Apr;89(4), Kurtz: Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030.*

[23] *Lee V, et al., Radiology 2000:365-372;*

[24] *Krinsky G, et al., Radiology 2001:219:445-454*

[25] *Michaely HJ et al, Invest Radiol 2013; 48: 590-597*

[26] *Rosenkrantz Ab et al, J Comput Assist Tomogr 2011; 35 (1): 96-101*

[27] *https://www.nejm.org/doi/full/10.1056/NEJMoa1716734*

[28] *J. C. Moon, D. R. Messroghli, P. Kellman, S. K. Piechnik, M. D. Robson, M. Ugander, P. D. Gatehouse, A. E. Arai, M. G. Friedrich, S. Neubauer, J. Schulz-Menger and E. B. Schelbert, "Myocardial T1 mapping and extracellular volume quantification: a Society for Cardiovascular Magnetic Resonance (SCMR) and CMR Working Group of the European Society of Cardiology consensus statement," Journal of Cardiovascular Magnetic Resonance, vol. 15, no. 92, 2013.*

[29] *R. Wassmuth, M. Prothmann, W. Utz, M. Dieringer, F. von Knobelsdorff-Brenkenhoff, A. Greiser and J. Schulz-Menger, "Variability and homogeneity of cardiovascular magnetic resonance myocardial T2-mapping in volunteers compared to patients with edema," Journal of Cardiovascular Magnetic Resonance, vol. 15, no. 27, 2013.*

[30] *El-Shater Bosaily A et al., PROMIS group, Contemp Clin Trials 2015;42:26-40; Ahmed H et al., Lancet 2017*

[31] *Kasivisvanathan et al., Precision Study group, NEJM 2018: MRI-Targeted or Standard Biopsy for Prostate-Cancer Diagnosis*

[32] *OECD database. https://data.oecd.org/healthcare/magnetic-resonanceimaging-mri-exams.html*

[33] *Medicare Physician Fee Schedule 2018, estimated national average for CPT Code 70551 MRI Brainstem without Dye. https://www.fmh.ch/ambulante_tarife/tarmed-tarif/tarmedaenderungen-ab-1-1-2018.html*

Siemens Healthineers Headquarters
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany
Phone: +49 9131 84-0
siemens-healthineers.com

Published by Siemens Healthcare GmbH · 12263 1022 online ·